SHOE REPAIRING

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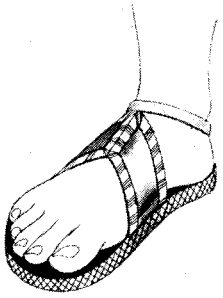
Introduction

The average person often has a very limited knowledge of leather. He may know that it is the skin of an animal, bird, reptile, or fish that has been processed to prevent decay. But he probably does not know much about the manufacturing and preparation of leather goods. Perhaps, he takes this useful material for granted and does not stop to think about the great contribution it has made to the daily comfort of man, and, indeed, to the very advance of civilization.

Exactly who discovered the art of coloring and preserving leather is a matter of conjecture. But there is evidence that leather has played a significant role in the development of our modern way of life. Man has always needed to protect his body from the elements. He found that animal skins protected his body from the cold. As man became more mobile, he found that he could protect his feet from being cut, bitten, or scratched if he wrapped them in skins. A warm skin provided a comfortable place for him to sleep. In time man found it expedient to store up extra skins. To protect these skins he may have placed them in a hollow tree stump. There the action of bark and water had a remarkable effect: the skin was able to resist deterioration. This secret was passed down from generation to generation. With this discovery began a new era. Man found that he could make containers of skin in which to store and transport water and food. He could build boats or make a shelter of skins. Man had, prior to this, learned that certain berries produced varied colored stains. Applying this knowledge to animal skins, early man began the ornamentation of leather.

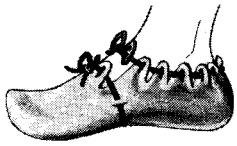
Further discoveries gave leather a more important role in history. Time and experience taught man that the same sharp stones that had plagued him in the past could be used to cut better fitting garments and footwear. He learned to sew pieces together, using sharpened bones and sticks as awls with sinews and tough vines as thread. Man even learned to use the skins of animals for preserving records. Ancient parchment documents survive even today.

Through the years, as the requirements for tougher footwear, stronger



Egyptian sandal
2500 B.C.

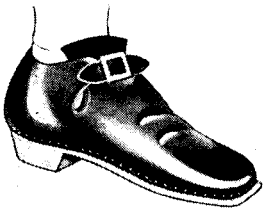
Roman compages
50 B.C.



German carbatine
10th century

French pikeman's shoe
15th century

First English oxford
1665–1670



English workshoe
18th century

Man's gored shoe
1850

Lady's lace boot
1883

Courtesy of the United Shoe Machinery Co.

protective clothing, and more beautiful decorative clothing increased, leather met the challenge.

In recent years, synthetic materials have been developed to supplement the supply of natural leather. The genuine leather produced annually in the United States as the byproduct of the meat, wool, and dairy industries could provide shoes for 600,000,000 people. These shoes usually last a long time, but eventually they will need repair. The craft of shoe repairing requires knowledge, skill, and a sense of dedication to one's work. This book was written with these aims in mind.

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SHOE REPAIRING

CHAPTER 1

Requirements Common to All Types of Shoe Construction

LASTS

Everyone knows that a shoe covers and protects the foot. The sole and heel of a shoe are commonly made of reasonably stiff and thick leather, and the upper part, which covers at least the instep and sometimes the ankle, usually is made of more pliable leather and sometimes of cloth or other fabric.

One often wonders why there are so many different methods of shoe construction. The reason for this is that manufacturers of work, dress, or children's shoes strive to produce footwear which embodies comfort, durability, and appearance. Since each kind of shoe will serve a specific purpose, each is built of different material and weight and in a way which will give the best service.

Whether the shoe is one of the standard types which stress durability and economy or one of the highly modern styles which stress eye appeal, the method of repairing must follow the method used in constructing the shoe.

After the design of the shoe has been determined by the shoe stylist, a wooden form called a *last* is made, over which the shoes are shaped. Lasts are carefully made to standard measurements to insure free foot action, to prevent foot distortion, and to give adequate support and pro-

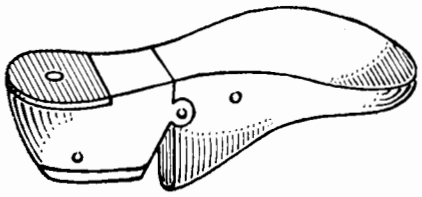


Fig. 1. Last with metal heel plate.

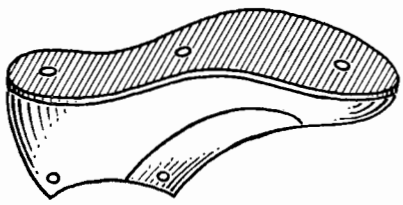


Fig. 2. Full iron bottom last.

tection to the mechanism of the foot. They are made in all sizes and widths to fit all shapes of feet. Though last sizes are standardized, all lasts of a given size are not all the same length, since extensions may be added to a last for reasons of style. Thus the extra length required in a pointed toe last does not enter into size calculations. Second, additional width also slightly increases the actual length of the last without increasing the numerical length. To illustrate, a 5B last would be longer than a 5A, yet shorter than a 5C. These changes are also made to preserve the integrity of style in a line of shoes.

Though lasts used in the manufacture of shoes are generally made of wood, the size may vary somewhat to meet the requirements of different methods of construction. Lasts in which the only metallic fasteners to perforate the inner sole are the nails used in attaching the heel, have a metal plate only at the heel (Fig. 1). Lasts in which nails or other types of metal fasteners perforate the inner sole have a full metal bottom (Fig. 2).

Repair lasts are made of metal so that the nails and metal fasteners used in repairing can be clinched. These lasts are made in various patterns to fit the numerous types of jacks (Fig. 3).

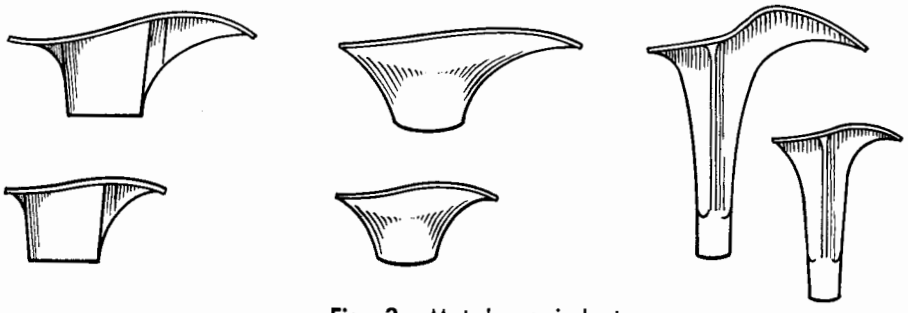


Fig. 3. Metal repair lasts.

SHOE SIZES

There has always been a wide variety in the size designation of shoes. However, attempts at standardization have resulted in a relatively uniform method of classifying shoes by size. Shoe sizes are given in length and width. The length of a shoe increases uniformly with the size designation. The starting point is infants' size O, which has a toe-to-heel length of 4 in. With each increment of one full size, this basic length increases ⅓ in. Thus size 1 is 4⅓ in. long, and size 3 is 5 in. long. Each half size increases one half of a full size or ⅙ in. Thus, a size 1½ is 4 + ⅓ + ⅙ or 4½ in. long. See Table I.

TABLE I. SHOE LENGTH

	1 Inch			
Full sizes . . .	⅓ in.	⅓ in.	⅓ in.	
Shoe sizes . .	6	7	8	9
Half sizes . . .	⅙ in. | ⅙ in.	⅙ in. | ⅙ in.	⅙ in. | ⅙ in.	

The width of a shoe is based on standard measurements around the girth of the last at three points – the ball, the waist, and the instep (Fig. 4). These sizes increase 3/32 to ⅛ in. per size depending on the general size classification.

The system of size designation is quite involved. In brief, shoes are classified generally as Infants', Children's, Misses', Women's, Little Boys', Big Boys', Men's. Each class begins with a basic size from which the other sizes in the class are determined. This basic size includes length and width measurements.

Different systems are used in marking shoes for size. The "plain" marking system is that which is normally used. For the average shoe buyer, this is the size he asks for in a store. Other coded systems are used such as the Standard Size Code, the French Size Code, and the Simplified Size Code. These are outlined in Table II.

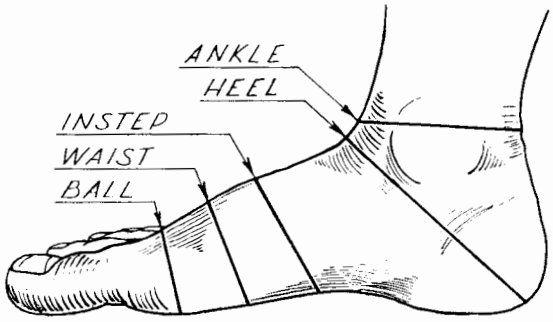


Fig. 4. Measuring the foot.

TABLE II. SIZE MARKINGS

PLAIN

Example:	6C	6½C	6E	6½E
Variation:	6C	6 — C	6E	6 — E (Dash denotes ½)

STANDARD

Example: 360 365 460 465

First numeral denotes width.
Second numeral denotes size.
Third numeral if "0," indicates no half size.
If "5" it indicates one half size.

Summary: 360 = 6C 365 = 6½C

TABLE II (Cont.)

FRENCH

In this code, as in the plain method, the size is indicated first, followed by the numeral indicating width. To decode, subtract 32 from the code numeral.

Example: Subtract 32 from the numeral 82 — 1, leaves 50 — 1. The "5" indicates the size. "0" indicates there is no half size. "1" indicates the width.

87 — 2 would be 32 from 87, or 55 — 2. The first "5" indicates the whole size, second "5" indicates there is a half size, while the "2" indicates the width.

Summary: 87 — 2 = 5½B 92 — 3 = 6C

SIMPLIFIED

Example: 39 — 3

Subtract 32 from 39 and you have 7.

The dash indicates ½.

The "3" indicates width C.

Thus 39 — 3 equals 7½C

Summary: 372 = 5B 38 — 1 = 6½A

UPPERS

Shoe tops, or uppers as they are called in the trade, consist of several parts, as follows: quarters, vamp, toe cap, foxing, backstay, tongue, and saddle. In the better-grade shoes these pieces are made from the finer grained leathers. As a rule, the skins of very young calves and kids are used because they have all the desired qualities such as texture, tensile strength, and lightness in weight, and they also produce an excellent finish.

These fine skins are also used in making many of the suedes, lacquer finishes, patents, bucks, and many of the reptile leathers.

The uppers of medium-grade shoes and slippers for special occasions are usually made of fabrics such as satins, gabardines, linen and cotton duck, and brocades.

Low-priced shoes are made from split leathers, sheepskins, inexpensive fabrics, and other materials. They are made with a low price in mind rather than for comfort and quality.

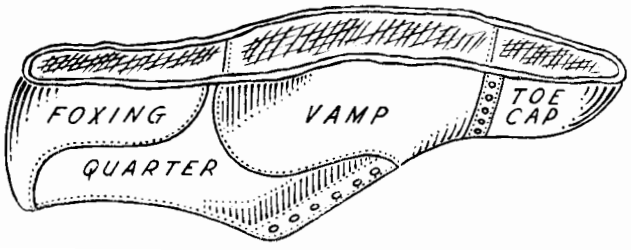


Fig. 5. Assembled uppers and lining.

Work shoes, semidress shoes, and boots are made of heavier calfskins, called *kips*, and lighter-weight cattle hides either split or full grain (Fig. 5).

Quarters. Quarters are the parts of a shoe which in low-cut shoes, begin at the laces and pass beneath the ankle bone and the heel, as shown in Figure 6. In high-top shoes, quarters pass around the heel and over the ankle, as shown in Figure 7.

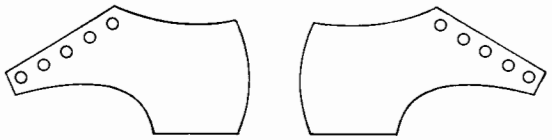


Fig. 6. Low-top shoe quarters.

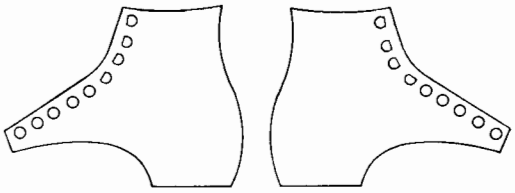


Fig. 7. High-top shoe quarters.

VAMPS

Vamp. Vamp is that part of a shoe from the throat (Fig. 9) down to the toe and down both sides to the soles. There are three principal types as follows: the common or cut-off (Fig. 8), the three-quarter for plain or double-tip shoes (Fig. 9), and the full length or seamless (Fig. 10).

Backstay. To get the correct shape in the back of a shoe, quarters are made in two pieces, combined with a seam down the back. In all shoes and boots, this seam is subject to a great deal of bending and twisting at every

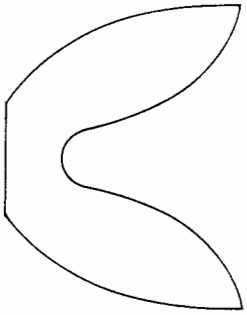


Fig. 8. Cut-off vamp.

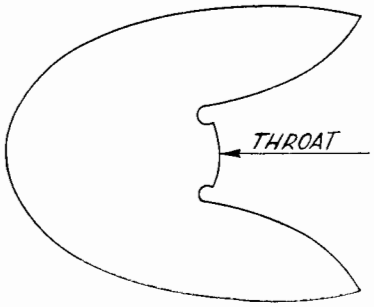


Fig. 9. Full-toe vamp.

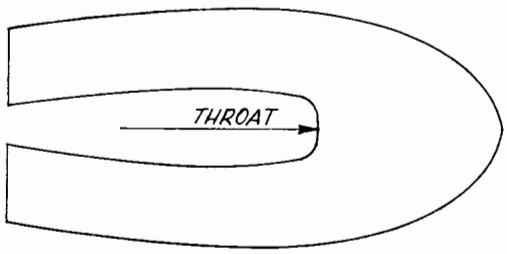


Fig. 10. Full-length vamp.

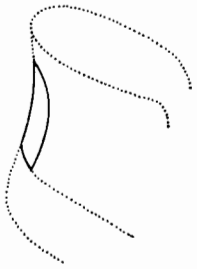


Fig. 11. Back stay.

step, and may rip unless it is reinforced. The reinforcement consists of a narrow strip of leather, known as a backstay (Fig. 11). Backstays are also used occasionally on low-cut shoes called oxfords.

Toe Cap. A toe cap or toe tip (Figs. 12 to 15) is at the extreme or toe end of the shoe. Toe caps are most often stitched to the cut-off end of the cut-off vamp (Fig. 8). Where there may be extra toe wear, they are stitched onto the three-quarter and full-length vamps. Tips are more often than not ornamented with fancy stitched or perforated designs.

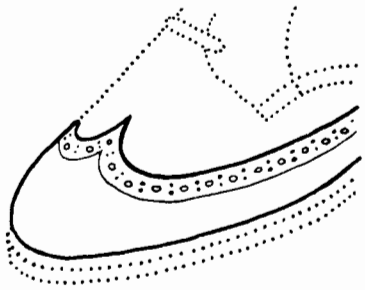


Fig 12. Wing tip.

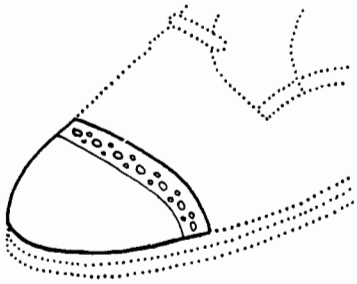


Fig. 13. Straight tip.

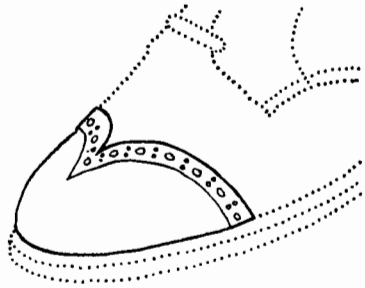


Fig. 14. Diamond tip.

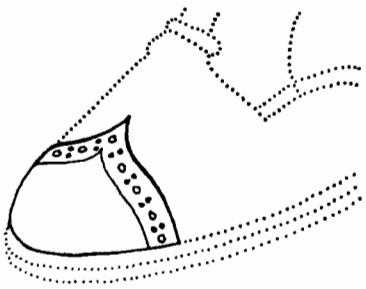


Fig. 15. Shield tip.

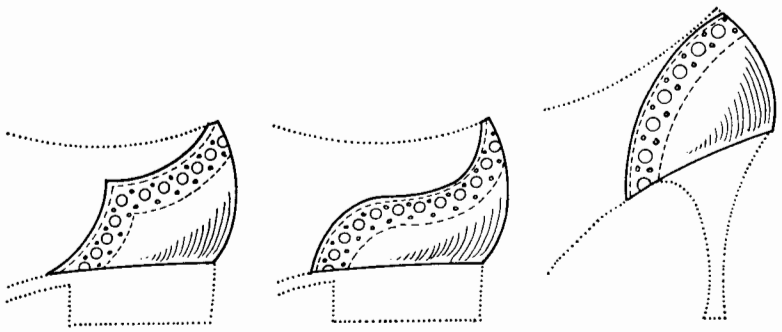


Fig. 16. Figure foxing

Foxing. Foxing is an extra piece of leather of various patterns fitted into or on top of the back part of the quarters. It serves only as a trimming and adds nothing to the strength of the shoe for, in most instances, a piece of the same shape and size is cut away from the quarters. It is often cut from a different kind of or different colored leather, thus creating a two-tone effect (Fig. 16).

TONGUES

Tongue. The tongue is a strip of leather attached to the throat or upper part of the vamp. It passes upward along the foot beneath the lacing to just below the two open ends of the quarters. It is usually fastened only to the vamp (Fig. 17), but on occasion is partly stitched to one of the sides of the quarter. In some types of shoes, however, it is attached to the vamp and is stitched to the quarters all the way up to the top of the

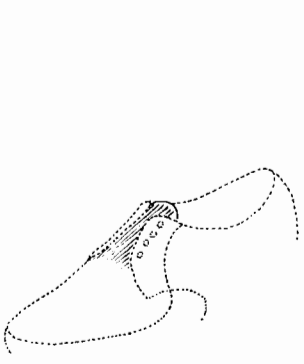


Fig. 17. Dress shoe tongue.

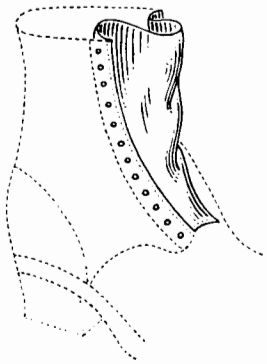


Fig. 18. Bellows tongue.

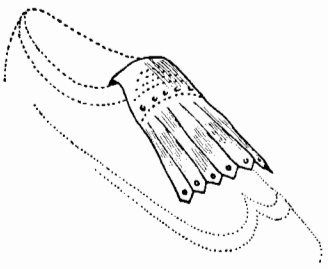


Fig. 19. Apron tongue.

shoe on both sides to prevent anything from working its way into the shoe at this point. This type of tongue is cut much wider at the top than at the bottom to provide room for the foot to slip into the shoe. It folds in when the shoe is laced and is known as a bellows tongue (Fig. 18).

Another type of tongue frequently used on low-cut shoes is the apron tongue or flapper tongue. This tongue is strictly ornamental and is attached in one of two ways. In some shoes it is attached directly to the vamp, extends up under the quarters, and down over the front of the shoe covering the lacing. In others, an extra piece is attached to the top of the regular tongue and drapes down over the front of the shoe like an apron. The end of the overlapping piece is usually fringed (Fig. 19).

Saddles. The saddles on a shoe are to the front of the quarters what foxing is to the back of them. They are merely another form of trimming. Saddles extend upward from both sides of the sole, over the instep to the lacing. They are either extra pieces stitched over the tops of the quarters, or they replace pieces of equal size and shape cut from the quarters. Very often they are cut from leather of a different color, and are an ornament rather than an added support for the instep (Fig. 20).

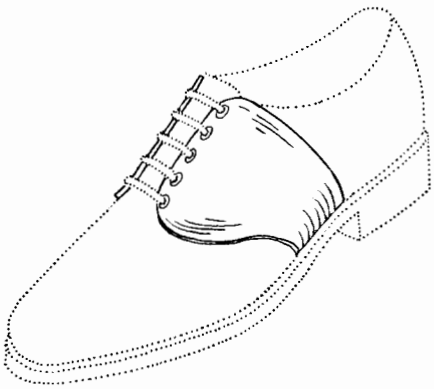


Fig. 20. Shoe saddles.

LINING

Linings are used to reinforce a shoe. They are known as quarter linings, vamp linings, toe linings, tongue linings, and heel linings, depending on what part of the shoe they reinforce. Such upper parts as foxings, backstays, and saddles are attached to the outside of a shoe and require no linings.

There are many kinds of linings. They serve to help keep the shape of a shoe and to produce a well-finished and comfortable shoe.

Linings must be made of materials that will not wear out readily and yet will permit ample air to reach the foot.

The above-mentioned linings are to be found in most shoes, while the following "secondary linings" are used only in some of the better-built shoes.

Between linings are an additional lining between the quarters and the quarter lining.

Doubler is an extra lining used for plumping purposes in the face part of the shoe, and adds nothing to the wearing quality of the shoe. In the better grades of shoes this lining is made from cotton twill or drill fabrics, while in the cheaper shoes it is very often made of paper.

Facing. The term lining includes lining reinforcements. Facing (Fig. 21), though it reinforces the shoe somewhat, mainly gives the junction of lining and quarter a more finished appearance.

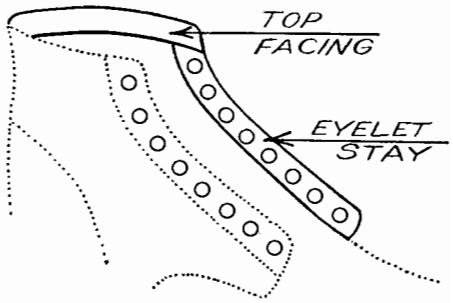


Fig. 21. Top facing and eyelet stay.

Stays. Though stays may often be referred to as facings, they render a more important service. Stays primarily serve to give added strength and protection to seams that are subject to severe flexing. The eyelet stay (Fig. 21) serves as a surface upon which to clinch the reverse side of the eyelet. In blind-eyelet shoes, the eyelet stay and the quarter lining are the sole support for the eyelet, the lacing hole through the quarter remaining unaffected.

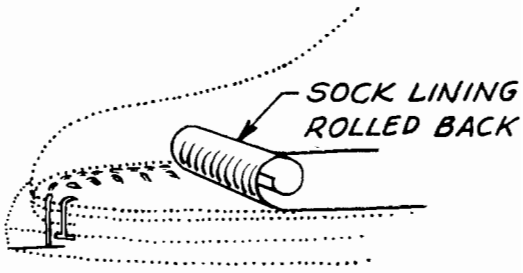


Fig. 22. Sock lining rolled back.

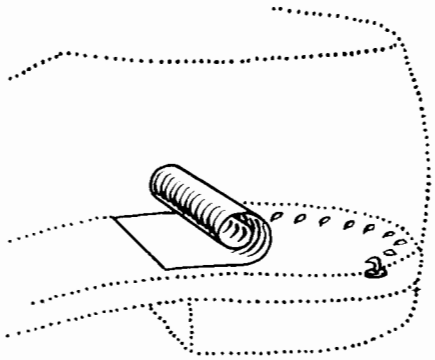


Fig. 23. Heel pad rolled back.

Sock Lining. Shoe construction in which nails, staples, or stitches appear on the inside of the shoe require a sock lining. Sock linings (Fig. 22) cover the entire length of the innersoles and are made of leather or various other materials. In the better grade of shoes, sock linings are cut from sheep or lamb skins and are often matched with the color of the quarters.

Heel Pads. Heel pads are pieces of leather or other materials not unlike sock linings but which are long enough to cover only the nails by which the heels are attached (Fig. 23). Replacement pads are available in leather, imitation leather, cork, and felt.

COUNTERS

The primary purpose of the stiffener, or *counter* (Fig. 24) which fits around the back of the heel of the foot, is to mold the shoe firmly to the foot. It not only adds considerably to the comfort of the foot but protects the shoe as well.

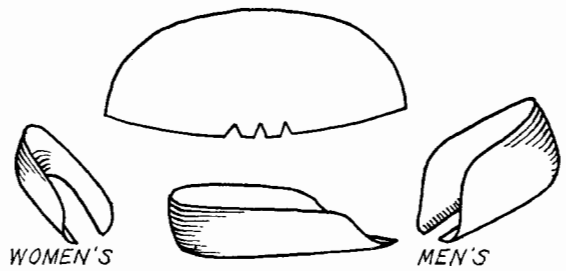


Fig. 24. Counters.

Counters usually are made by manufacturers who specialize in this particular product. They are made in many shapes and sizes, for every

type of shoe, and of many different materials such as various grades of leather, fiberboard, glue-saturated canvas, and paper.

TOE BOX

At the front end of the shoe is another stiffener, called the *toe box* (Fig. 25). This stiffener acts as a housing for the toes to protect and guarantee their free action, which is so necessary in propelling the body forward while walking.

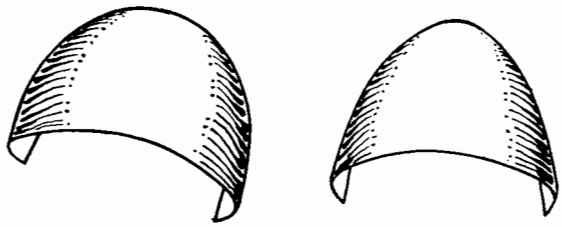


Fig. 25. Toe boxes.

Toe boxes are made in many shapes and of a large variety of materials depending on the kind of shoe and the purpose which they are to serve. The materials used are different grades of leather, fiberboard, buckram, and many types of glued and shellacked fabrics.

STYLES OF UPPERS

Several different styles are used in the basic design of uppers. The balmoral, or "bal," style is of British origin, the name coming from Balmoral castle in Scotland, where the shoe was, according to tradition, first made. In this shoe, the quarters are laced together and the vamp is sewn over the quarters (Fig. 26). The blücher shoe is based on a boot designed

Fig. 26. Vamp overlaps quarters.

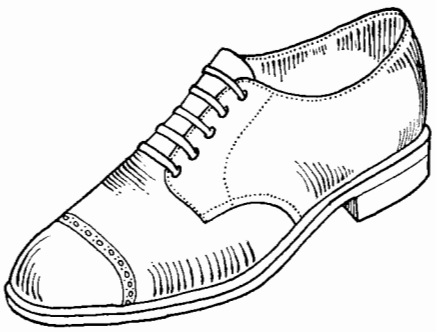


Fig. 27. Quarters overlap vamps.

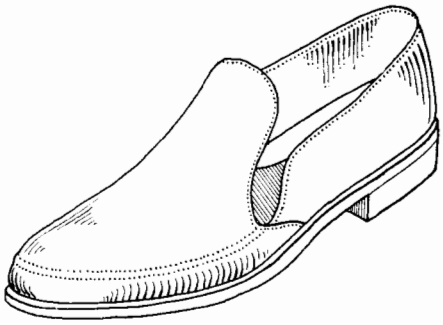


Fig. 28. Semicongress type.

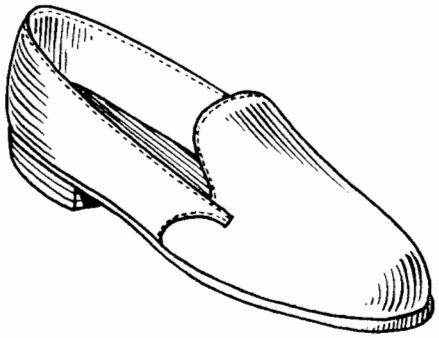


Fig. 29. Everett.

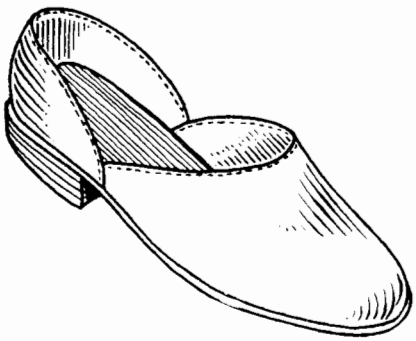


Fig. 30. Opera.

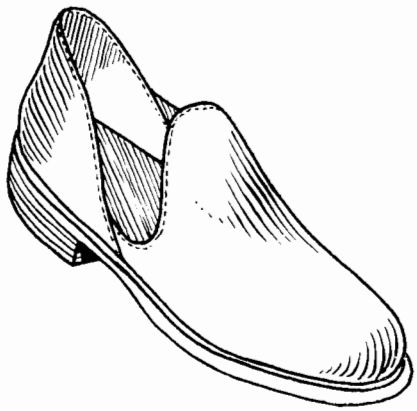


Fig. 31. Romeo.

Fig. 32. Moccasin.

by the Prussian General Blücher (Fig. 27). Here, the quarters are sewn over the vamp.

Slippers. The semicongress style is a low-quarter version of the congress shoe, which was popular in the late nineteenth century (Fig. 28). This shoe is held to the foot by an elastic gusset called a goring. The everett slipper is designed with a medium vamp and relatively low backs (Fig. 29). The

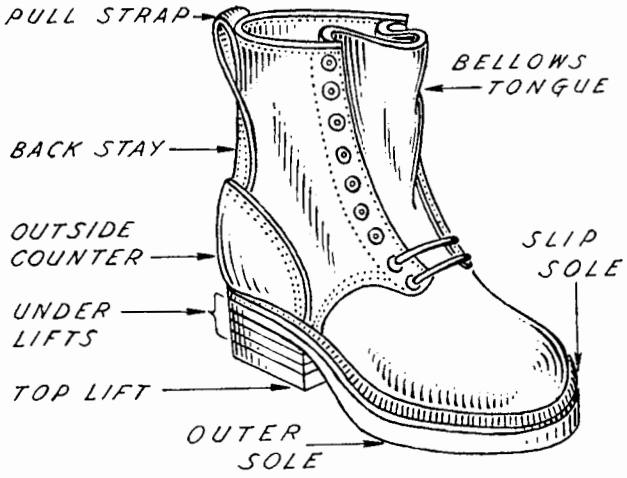


Fig. 33. Heavy-duty work shoe.

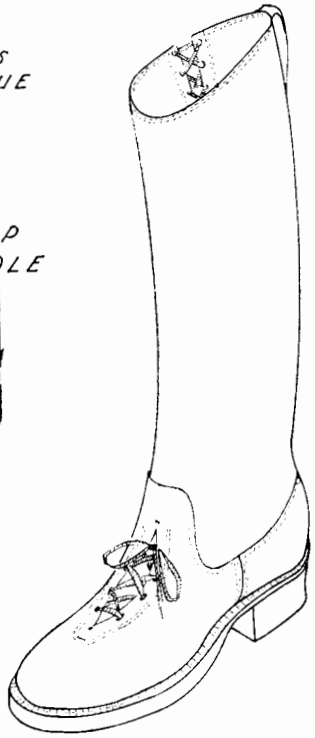


Fig. 34. Riding boot.

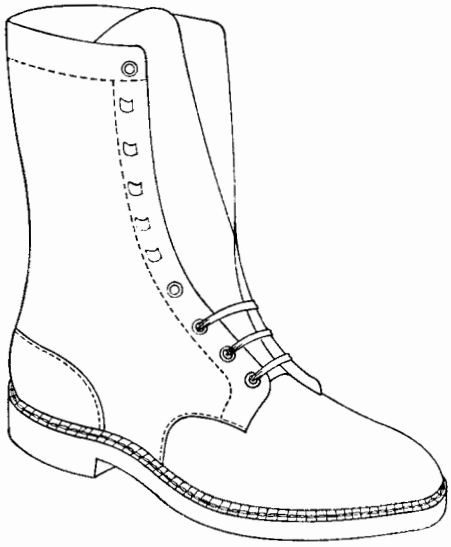


Fig. 35. Sport boot.

Fig. 36. Lineman's boot.

opera style is a seamless shoe or slipper that ordinarily has a medium to low vamp and a medium back (Fig. 30). The romeo has a high vamp and back, with the sides cut very low (Fig. 31). The moccasin originated with the North American Indians (Fig. 32). The vamp covers the bottom of the foot and extends around the shoe at a medium to low height. The vamp is joined at the front of the shoe by a vamp plug.

Work Shoes and Boots. The heavy duty work shoe is characterized by double soles and the use of counters, box toes, and heavy leather to give greater strength and durability to the uppers (Fig. 33). A bellows tongue is often employed. Like the work shoe, the side of the boot is extended above the ankle. A few of the many styles of boots are illustrated in Figures 34–36. Note that the lineman's boot is reinforced at the ball of the foot.

EYELETS

An important part of the uppers are the eyelets which are used in lacing. The eyelets are small metal or plastic rings set in the leather to

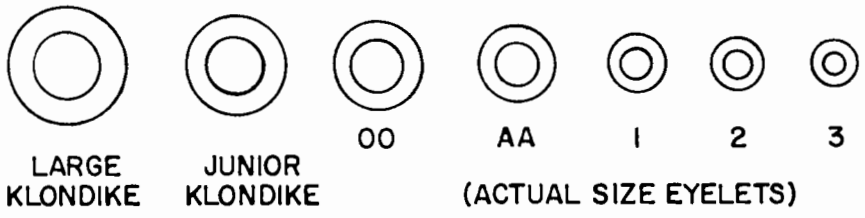


Fig. 37. Eyelets.

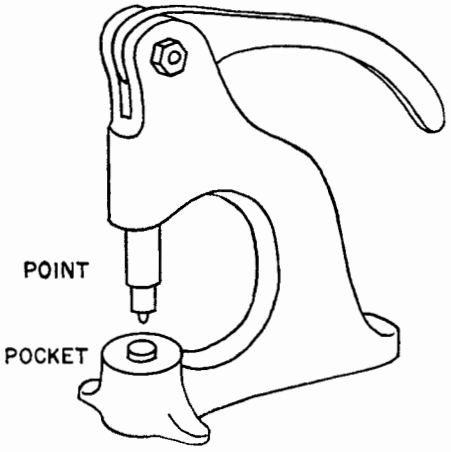


Fig. 38. Eyelet setter.

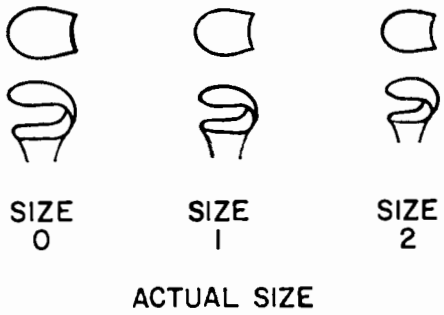


Fig. 39. Hooks.

protect it from the abrasion of the laces (Fig. 37). Some eyelets are set so that they go completely through the quarter. However, others are set blind, that is, they are not visible from the outside, being set in the lining and eyelet stay. Depending on the type of shoe, any of a number of eyelets are available. Table III shows what pocket and point to use with the eyelet setter (Fig. 38). Refer also to Figure 37. Hooks are sometimes used, instead of eyelets, mainly on boots or high-quarter work shoes (Fig. 39).

TABLE III.

EYELETS	USE POCKET	USE POINT
Large Klondike	L.K.	L.K.
Small Klondike	S.K.	S.K.
Junior Klondike	J.K.	J.K.
00	00	0.0.
AA	A.A.	A.1.
0	0	11.
1. Perfection	A.1.	11.
1. Fast Color	1.	A.1. or 11.
LL. Common	1.	11.
2. Perfection	1.	1–2–3–H.
3. Perfection	2.	1–2–3–H.
2. Fast Color	2.	1–2–3–H.
3. Fast Color	3.	1–2–3–H.
9. Common	2.	1–2–3–H.

REVIEW QUESTIONS

Lasts

1. What is a last? How is it shaped?
2. For what purpose is a last used?
3. Why must a last be carefully shaped?
4. What is the difference between a repair last and the type used in the manufacture of shoes?
5. Why do some manufacturer's lasts have a full iron bottom? Why have some only a metal plate at the heel?

Shoe Size Markings

6. What increase in shoe length (in inches) corresponds to an increase in size of 1½?
7. State the size indicated by 375 in the Standard Size Code.
8. In the Standard Size which of the three numerals indicates the width?
9. What number indicates no half size in the Standard Code?
10. In French markings, 77 – 2 indicates what size?

Quarters and Vamps

11. What part of the foot does the quarter cover?
12. In what way do quarters for high and low shoes differ?

13. Describe the two most used types of quarters.
14. What part of the foot does the vamp cover?
15. To what upper parts are vamps attached?
16. Name the three most used types of vamps.

Toe Tips, Foxing, Tongues, Shoe Saddles

17. Is it necessary for all tips to be of the same shape?
18. To what upper part are toe tips attached?
19. Name at least two styles of toe tips?
20. Locate the position of foxings.
21. What service do they render, if any?
22. Name the type of tongue that is stitched all the way to the top of the quarters.
23. On what type of footwear are these tongues found?
24. Name the type of tongue that covers the laces.
25. What is the purpose of the tongue?
26. What kinds of materials are used to make shoe tops, or uppers?
27. What materials are used in medium-grade shoes? In low-priced shoes? In heavy work shoes?

Linings

28. What is the purpose of shoe linings?
29. Name the linings and give their location.
30. Name some of the specific purposes some of these linings serve.
31. What are some of the materials used for linings?
32. Are sock linings classed as linings?
33. What types of shoe construction do not require a sock lining?
34. What is a heel pad?
35. Why do some shoes only require a heel pad?
36. Name some of the materials used for sock linings, for heel pads.
37. How does a facing differ from a stay?
38. What specific purpose do facings and stays serve?

Counters and Toe Boxes

39. What is the trade name for the stiffener in the back of the shoe?
40. Why is this stiffener needed in a shoe?
41. What is the trade name for the stiffener in the front of the shoe?
42. What is the purpose of this stiffener?
43. What materials are used in these stiffeners?

Styles of Uppers

44. What does the designation "bal" or "balmoral" have reference to?
45. Describe the method of joining vamp and quarter in this type of shoe.
46. Describe the method of joining quarter and vamp in the blücher type of shoe.
47. What method is used in fitting the quarters snugly to the foot in the congress type of construction?

48. Describe the various kinds of slippers.
49. Describe the basic characteristics of a work shoe.
50. What is the distinguishing characteristic of a boot?

Eyelets and Hooks

51. What is an eyelet?
52. What is a blind eyelet?
53. What is a pocket?
54. What is a point?
55. Where are hooks sometimes used?

GENERAL QUESTIONS

1. List the parts of a shoe, as discussed in this chapter.
2. Which part of the shoe do you think is most important? Why?
3. Judging from your present knowledge, which part of the shoe do you think most difficult to make? Why?

CHAPTER 2

Common Types of Shoe Construction

WELT SHOE

Even though there are many new methods of shoe construction, the welt shoe is still most popular (Fig. 42). The reason for its continued popularity is that it has all the qualities for comfort and flexibility desired in footwear. An outstanding feature of this type of shoe is that it retains its original features, plus shape and appearance, after repairing.

A careful study of the illustrations of this shoe will show that this is one of the few types of shoe construction in which the sides of the inner sole that come in contact with the foot are free of seams, tacks, staples, pegs, or nails, with the exception of the heel. This fact makes a more comfortable shoe because this construction permits flexibility not found in nailed or pegged shoes.

Inner Sole. The inner sole must be specially prepared by cutting a narrow, rectangular groove, or rabbet, around the edge of its flesh side. Just inside of and paralleling this rectangular groove a channel is cut, thus creating a ridge, or *lip* (Fig. 43), to which the uppers, lining, and welt

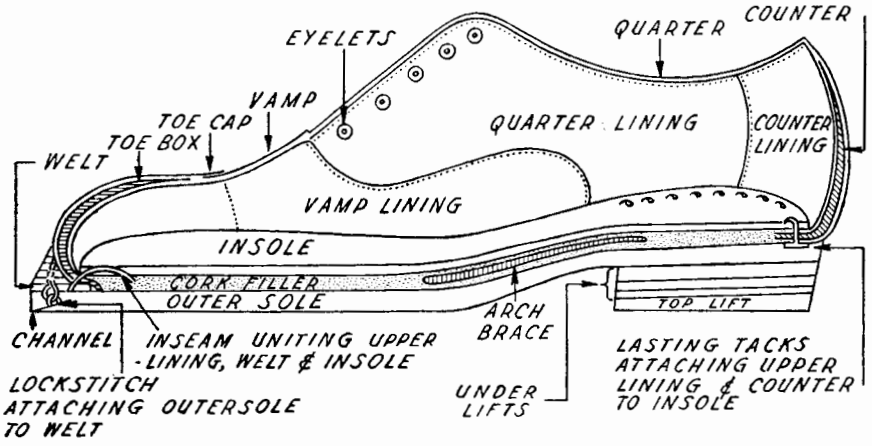


Fig. 42. Welt shoe.

Fig 43. Lip — single channel.

Fig. 44. Lip — parallel opposed channels.

are later stitched. Instead of the single channel, two parallel opposed channels may be cut as shown in Figure 44.

The inner sole is now temporarily attached to the bottom of the wooden last, which in this type of shoe construction has no iron bottom but merely an iron plate at the base of the heel (Fig. 1).

Lasting. The uppers, into which the counters and toe box have been previously fitted, are now placed over the last with the attached inner sole. *Lasting*, as the operation is called, consists of pulling the tops, or uppers, tightly down over the last in order to remove all possible stretch as well as wrinkles. During this operation the tops are temporarily tacked to the inner sole with the exception of the heel. The heel is fastened permanently with tacks which are clinched against the iron plate on the heel of the last (Fig. 1).

Welt. The next step in the construction of this shoe is to attach a narrow strip of leather, or *welt*, to the inner sole. This welt usually is grooved and beveled along one edge to receive and protect the stitches with which it is attached (Fig. 45). See Figures 45–47 for some types of welt. The welt, uppers, and lining are stitched to the ridge created for this purpose on the bottom of the inner sole (Figs. 43 and 48). This same

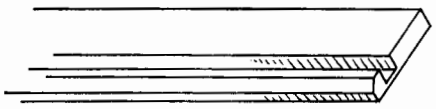


Fig. 45. Grooved and beveled welt.

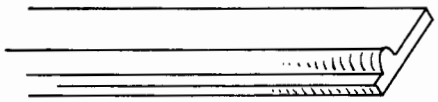


Fig. 46. Ridge welt.

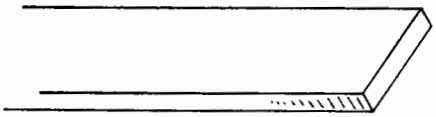
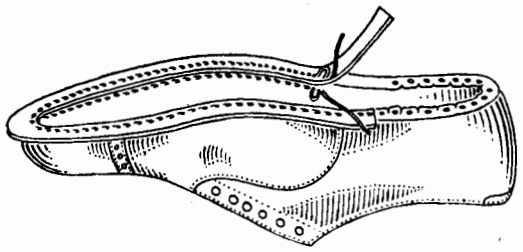


Fig. 47. Plain welt.

Fig. 48. Stitching welt, uppers, and lining to ridge.



operation also makes permanent the temporary attachment of uppers and lining to the inner sole. This seam is sewed with a chain stitch and is known as the *inseam* because, when the shoe has been completed, the seam is entirely hidden from view and can be seen only when the outer sole has been removed.

Shank. After the foundation has been laid, the arch, which forms the bridge of the shoe between the heel and the ball of the foot, must be reinforced or braced. The piece which reinforces this part of the shoe is called the *shank*.

Shoes which lace or fasten well up over the instep, such as oxfords or high shoes, assist somewhat in holding up the arch, but slippers are entirely dependent upon a brace. A strong and well-fitted brace is very valuable because, without it, the front, or *breast*, of the heel would be forced up into the foot, making the shoe unwearable. In some types of high-heeled shoes, the heel would be forced backward and break down completely if there were no shank brace.

Shanks, or braces, are made of either wood or steel in various patterns and widths, for whatever type of shoe they are to serve.

The fitting of shanks is not a hit-and-miss affair. They must fit the shape of the last and must be long enough to reach well under the heel, extending forward to the ball of the foot. These braces are tacked at both ends to the inner sole or to a piece of fiberboard which fills up the cavity at the shank (Fig. 49).

Filler. The balance of the cavity from shank to toe must be filled. Important qualities of this filler are that it must be waterproof, a nonconductor of heat and cold, and act as a cushion to the shoe bottom. It must also be nonsqueaking, light, and flexible so that it will not stiffen the shoe (Fig. 49).

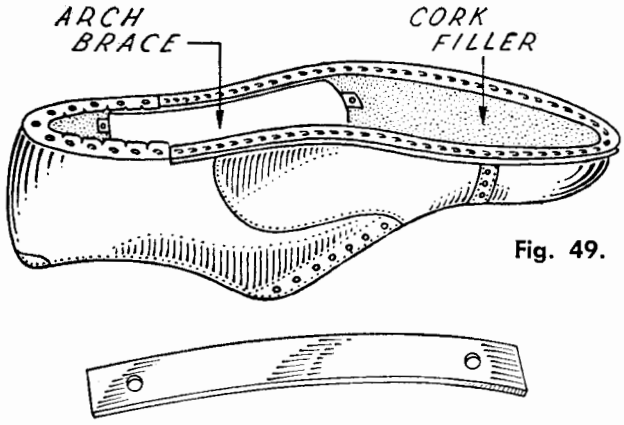


Fig. 49. Arch braces and filler.

Fig. 50. Midsole.

Fig. 51. Slipsole.

Midsoles and Slipsoles. Shoes with heavy tops, such as semidress and work shoes, require a plump sole to create proper balance and enough thickness for outdoor wear. A light sole of cheap-quality leather, usually light belly stock, is built into the bottoms between the shoe and the outer sole. It is firmly cemented to the outer soles, both of which are cemented and stitched to the shoe in one operation.

Midsoles are full length and are used in boots and shoes which are subject to rugged wear (Fig. 50). Slipsoles are only half length from the toe to the front end of the shank; they are used on shoes not subject to hard service (Fig. 51). These soles do not, however, improve the wear of the shoe since the material used is not suitable for this purpose but add to the appearance.

Outer Soles. These soles are carefully selected for tannage weight and grade to meet all requirements for which a shoe is built. They are cut from the better parts of the hides, and are carefully buffed so as to remove all excess flesh or loose fibers. They are then molded and cemented to the shoe. Finally, they are stitched to the welt by means of a lockstitch seam (Fig. 53). In some shoes this seam cannot be seen on the welt side because it is buried in a channel in the welt. To add to the appearance of the finished shoe, this seam sometimes is buried in a channel in the outer sole (Fig. 42). This channel often opens up or wears away with the use

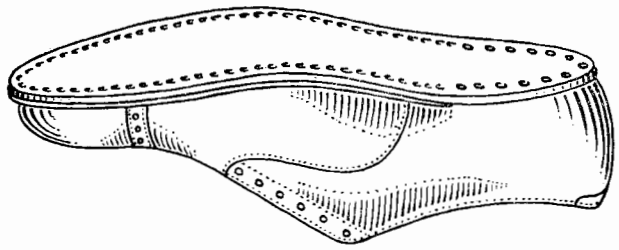


Fig. 52. Outer sole.

Fig. 53. Lockstitch seam.

of the shoe, after a short period; the only resulting damage is that the customer thinks it is a poor piece of leather. Therefore, in most shoes the stitching is done in a groove at the bottom of the shoes made with a groover (see Fig. 223 or one attached to the stitching machine in Figs. 286 and 302).

These methods of fastening the sole, however, are very substantial because the strong thread used for this purpose is fed through a liquefied wax in the process of sewing. The wax becomes solid and thus seals the thread tightly into the leather. The wax not only holds the thread firmly but it is a protection against moisture and friction.

Since this is the only means of attaching this type of sole, the inside of the shoe is free of metallic fasteners or stitches, with the exception of the heel. The nails in the heel, however, are clinched and covered by a heel pad.

McKAY SHOE

Although the principle of construction is the same for all types of McKay shoes, some of the details are different. In comparing the illustrations of the different types, it will be found that the preliminary steps are the same. In all types, the outer sole is either directly or indirectly attached to the inner sole by means of a chain stitch which penetrates through the inner sole to the foot side (Fig. 54).

In the McKay shoe, the inner sole needs no channeling or preliminary

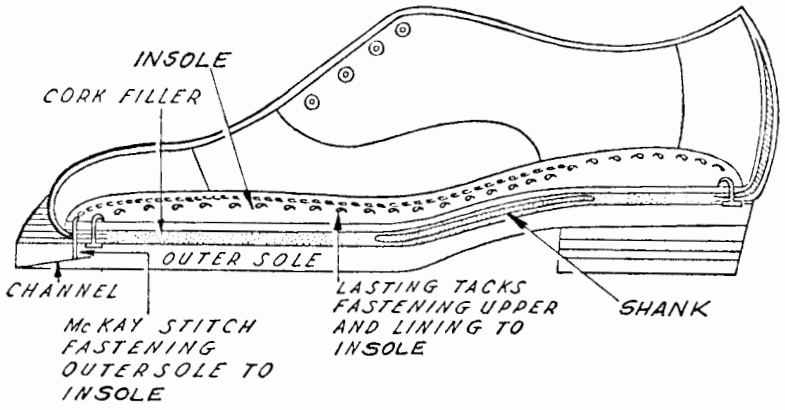


Fig. 54. McKay shoe.

preparation. It is merely cut to the shape of the last. The material used for inner soles is split leather, bellies, or cardboard, depending upon the price at which the shoe will sell.

Unlike the welt shoe, in which the inner sole is attached to a wooden last, the inner sole of the McKay shoe is attached to an iron-bottomed last. This last is placed in position in the uppers into which a counter and a toe box have been fitted. The uppers now are tightly drawn up over the last and are permanently tacked to the inner sole.

The shoe now is ready to receive the arch brace (shank) and filler. These operations are identically like those used in constructing the welt shoe (see Fig. 49).

In the simple type (Fig. 54), the shoe is now ready for the outer sole. This sole, after it has been cemented, is molded and pressed into place. The sole is permanently attached to the shoe with the McKay stitch. This is a chain stitch which does not have the holding qualities of a lock stitch, and necessarily must be protected against wear (Fig. 55). The

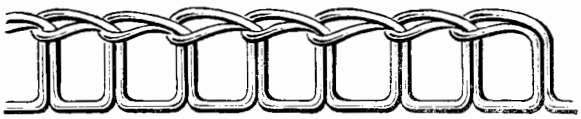


Fig. 55. Chain stitch.

seam, therefore, is placed in a channel cut into and around the edge of the outer sole. However, since this channel wears away and sometimes opens up with the use of the shoe, the stitches are reinforced with nails or staples and the channel is sealed with cement.

This seam passes through both the outer and the inner soles, and the lasting tacks and reinforcing staples can be seen on the inside of the shoe. The seam as well as the fasteners, therefore, must be covered to protect the foot. This is done, after completion of the shoe, by placing a lining, called a *sock lining*, over the inner sole. Sock linings are made of thin leather skivings, sheepskin, imitation leather, cloth, or paper, depending upon the desired selling price of the shoes.

The construction operations for the McKay shoe shown in Figure 56 are similar in all respects to those of Figure 54. There is an exception, however, in that instead of stitching the outer sole directly to the inner sole, a narrow strip of leather, together with the uppers and lining, is stitched to the inner sole. Since this is a chain stitch (Fig. 55) the stitches are reinforced with tacks or staples.

The arch brace or shank (Fig. 49) and fillers are now placed in the shoe; and the outer sole is cemented, molded, and pressed into position.

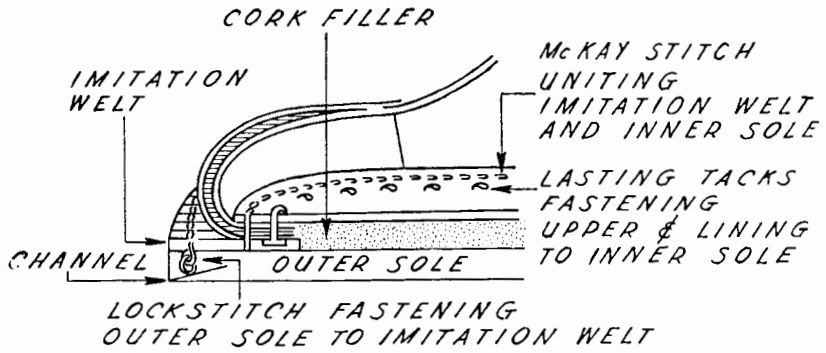


Fig. 56. Reinforcing the chain stitch.

The outer sole attachment then is made permanent. It is stitched to the narrow strip of leather by means of a lockstitch (Fig. 53), with the result that, when the shoe has been completed, it is hard to distinguish it from the welt shoe.

The McKay shoe can be distinguished from a welt shoe by looking inside the shoe for a sock lining. It will be found, when lifting this sock lining slightly, that it covers the seam and metallic fasteners by which the bottoms have been attached. This seam and the fasteners are not used in a welt shoe.

The double-sole type of McKay shoe (Fig. 57) combines to some extent some of the construction details of the other two types of this shoe. The procedure in the three different types of McKay shoe is the same up to and including the attaching of the uppers, and the placing of the shank and fillers.

The next step in making the double-sole shoe is the same as the simple McKay, Figure 54, in that a sole is now attached to the inner sole with a chain stitch which must be reinforced by metallic fasteners.

In all double-sole shoes, in addition to careful cementing, it is necessary to place a piece of cloth or other antisqueak material between the outer

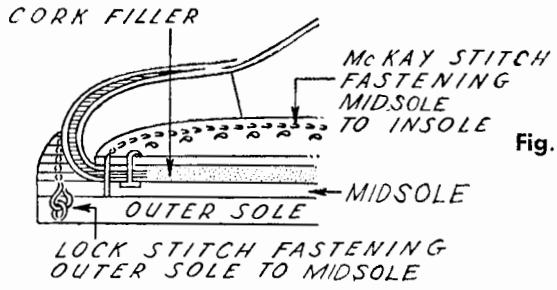


Fig. 57. McKay double sole.

and the middle sole. Paper should not be used. It often happens that, because of constant flexing of the soles, the adhesion breaks, thus causing a squeak between the two soles.

The outer sole is next permanently attached to the midsole with a lockstitch that goes around the edge of the entire shoe. When completed, the shoe has the appearance of a welt shoe. The only way that it can be identified as a McKay shoe is by looking inside the shoe for a sock lining which covers a seam and metallic fasteners.

STITCHDOWN

A wide variety of footwear is manufactured by the stitchdown process. This method of shoe construction ranks with the leaders in quantity output.

Stitchdown construction is mainly used in children's shoes, slippers, and sandals. The uppers, instead of being turned inward and under the shoe, are turned outward and stitched down.

This type of shoe can be made in different ways, but the underlying principles are the same in all. The uppers are flanged outward and stitched down all the way around the shoe, including the heel. Therefore, no tacks or seams show on the insole and no sock lining or heel pads are needed.

SINGLE-SOLE STITCHDOWN

This type of stitchdown is very simple for it consists only of uppers and an outer sole (Fig. 58). No insole is required. The last is placed in position

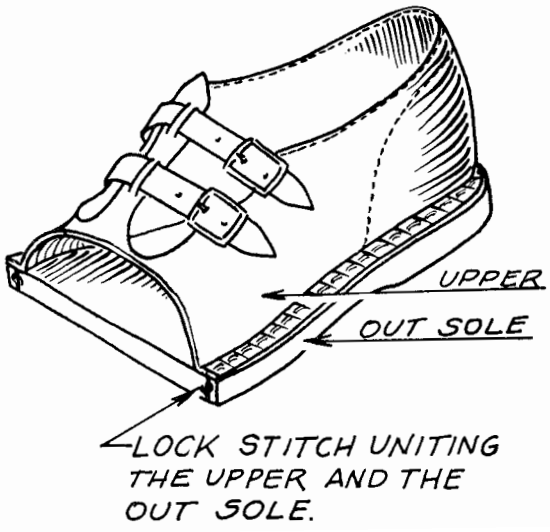


Fig. 58. Single-sole stitchdown.

in the uppers which, instead of being turned under, are turned outward. The outer sole, which is the only sole in the shoe, is cemented to the turned-out upper and is attached by means of a lockstitch. The uppers act as a welt, and the outer sole as an insole.

This single-sole method is used mostly in making barefoot sandals and infants' shoes. Usually no lining or counter is required. Where a counter is used, it also is turned outward between the uppers and the sole. The counter is attached along with the uppers because this type of shoe is stitched all the way around.

TWO-SOLE STITCHDOWN

This method (Fig. 59) is used in the better grade of stitchdown shoes and is a little more difficult than the single-sole stitchdown. This shoe also has no insole. The last is placed into the uppers and the edges are turned outward.

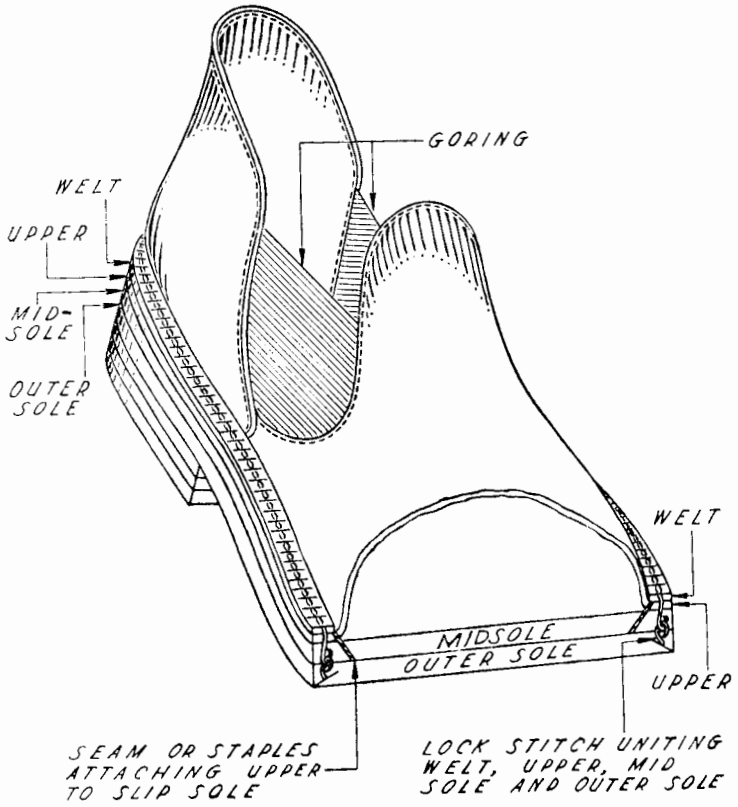


Fig. 59. Two-sole stitchdown.

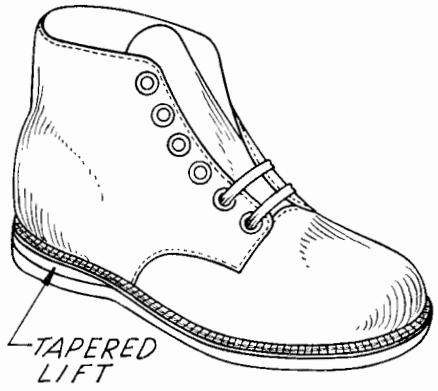


Fig. 60. Spring heel type of stitchdown shoe.

Instead of attaching the outer sole as in the single-sole stitchdown, a light sole of inferior leather is temporarily tacked to the bottom of the last. The sole then is cemented to the turned-out edges of the uppers which again serve as a welt.

The uppers and the sole now are either stapled or stitched together by a chain stitch. Since this seam is just an extra fastening, it is not necessary to reinforce it.

The outer sole next is cemented to the shoe and is fastened by a lockstitch seam. This seam passes all the way around the shoe, through the outer sole, the middle sole, the extended uppers, and a narrow strip of leather which is laid by the machine as the shoe is being stitched.

This narrow strip of leather serves a double purpose. It prevents the edges of the uppers from curling and fraying, and it gives the shoe a much better finished appearance.

When a heel is desired, as in children's shoes, a layer of leather beveled at the front end is inserted between the two soles before they are stitched, thus forming a wedge or spring heel (Fig. 60).

CEMENTED SHOE

With the continued development of stronger adhesives and efficient machines, the cemented shoe has been gaining in popularity down through the years. In the middle of the nineteenth century, cemented shoes were made but the cement deteriorated too quickly for the process to achieve much popularity. Better sewing machines practically eliminated the cemented shoe until the discovery of pyroxylin cement after the First World War. Once again, shoe manufacturers turned to cemented shoes to make an economical, light shoe. New manufacturing methods and

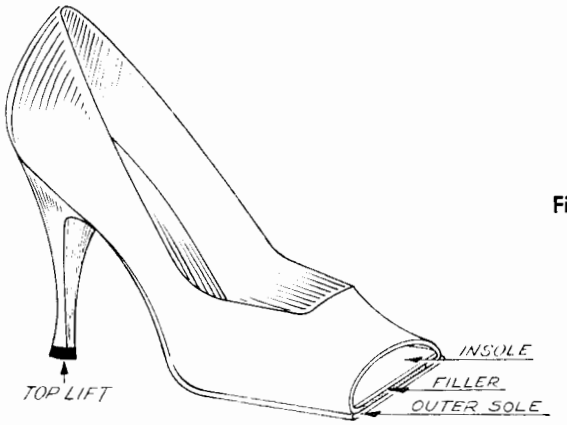


Fig. 61. Cemented shoe.

machinery were developed until today more shoes are made by this process than any of the other methods.

A much lighter insole can be used in this type of shoe. Thinly split leather and leather skivings can be used because the inner sole, in this method of construction, merely holds the uppers and lining in position until the outer sole can be cemented in place. In this construction, the outer sole is the real foundation of the shoe.

To make sure that the cement will penetrate the fibers, the inner soles are roughened around the edges and temporarily attached to the last. The last is put into the uppers, into which the toe box and counters have already been placed.

The uppers now are tightly drawn up (*lasted*) over and cemented to the inner sole, after which they are set aside, for a short time, to dry. After the cement has dried, the arch brace (shank) and a thin layer of filler are inserted. In some types of construction the upper is attached to the insole by tacks as well as cement (Fig. 62).

The overlapping part of the uppers, or rather that area of the uppers which was cemented to the inner sole, and the area around the flesh side of the outer sole, are now well roughened. A coating of pyroxylin cement then is added.

After this cement has dried, a coat of solvent is applied to reactivate

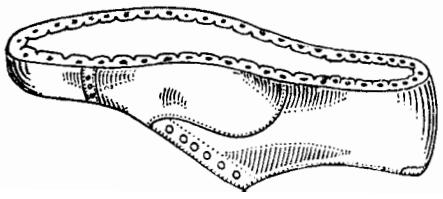


Fig. 62. Tack lasted cement shoe.

the cement. The soles then are pressed into position and are permitted to become completely dry.

Today the same results may be obtained with an all-purpose cement appearing commercially under various trade names. The procedure is the same except that the cement need only to become tacky before applying the sole.

CAUTION: Be careful to follow instructions. Cement is highly inflammable. It can also be harmful with too long inhalation and skin contact.

TRUE MOCCASIN

To use the name *moccasin* for this type of shoe may be somewhat startling because when we use this term we usually think of the North American Indian or the Eskimo footwear, or house slippers. But the basic construction involved is the same in that the vamp acts as an insole, as shown at *A*, Figure 63. It extends up and around the foot, as shown at *B*, and is joined together by a piece of leather which begins at the place where the toe cap would stop, and extends up to the throat of the shoe where the tongue is attached. This piece of leather, known as a *vamp plug*, in some cases extends upward to form a tongue as well.

From this point on, the present-day moccasin differs to some extent from its primitive model so that it will fit more snugly. The top is made to be laced instead of drawn up with a drawstring.

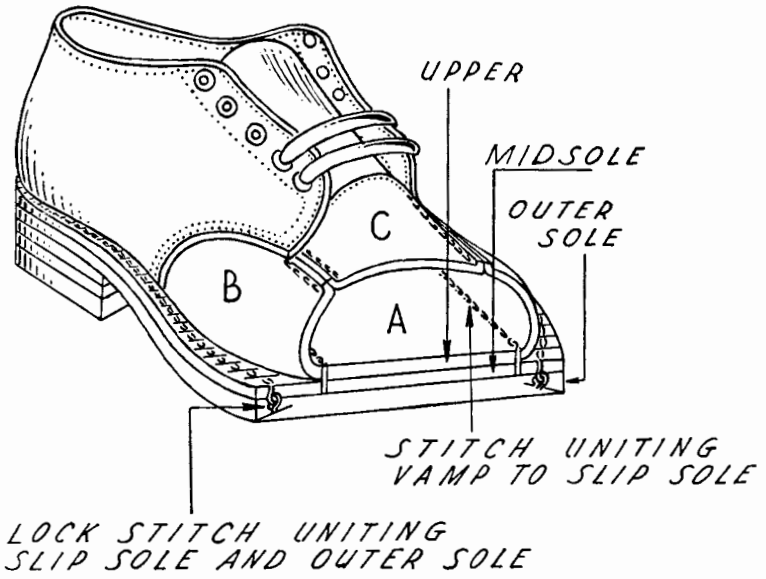


Fig. 63. True moccasin.

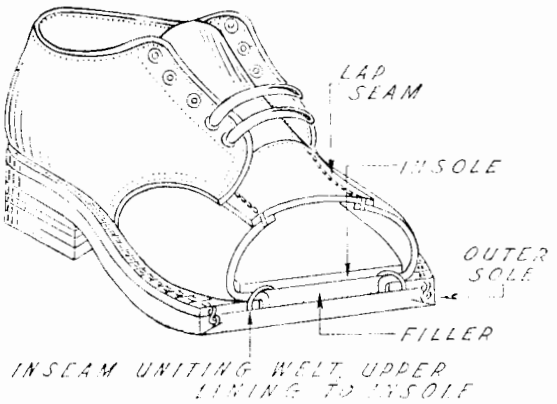


Fig. 64. Imitation moccasin.

Another change from the original moccasin is to add heavier soles for better wear, and heels for more comfort. Unlike other shoes, this shoe requires no insole or filler.

A middle sole, which usually is belly stock, is stitched to that part of the vamp which extends under the foot and takes the place of the inner sole. A chain stitch is used and it extends all the way around the inside of the shoe.

The next step is the same as that used in the McKay shoe (Fig. 57) in which the outer sole is attached with a lockstitch to the extended edge of the middle sole. Since this seam inside the shoe lies on the extreme outer edge, it seldom comes in contact with the foot, and occasionally is not covered with a sock lining.

IMITATION MOCCASIN

A comparison of Figures 63 and 64 will bring out the differences between the true moccasin and the imitation moccasins. The shoes are alike in the manner in which the uppers are fitted. A vamp plug is used in both shoes. But the bottom of the shoe is built like a welt shoe. Welt is attached to the insole and upper, and the outer sole is lockstitched to the welt. (See pages 18–22, for a full treatment of the welt shoe.)

VAMP PLUGS

A vamp plug is a separate piece of leather inserted in the vamp, over the ball and toes of the foot as in a moccasin. Some vamp plugs extend only to the throat of the shoe, while others continue on to form a tongue. The vamp plug may be attached to the vamp in a number of ways. A lap seam may be used (Fig. 65). In this, the vamp plug laps over the edge of

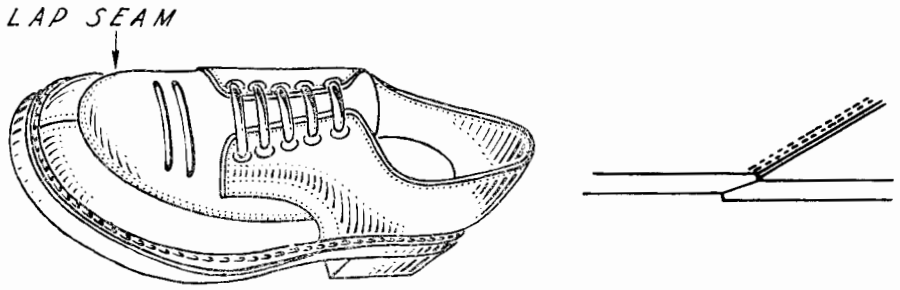


Fig. 65. Vamp plug attached by means of lap seam.

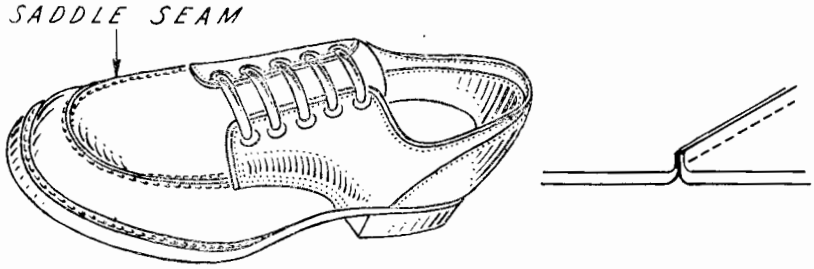


Fig. 66. Vamp plug attached with butt or saddle seam.

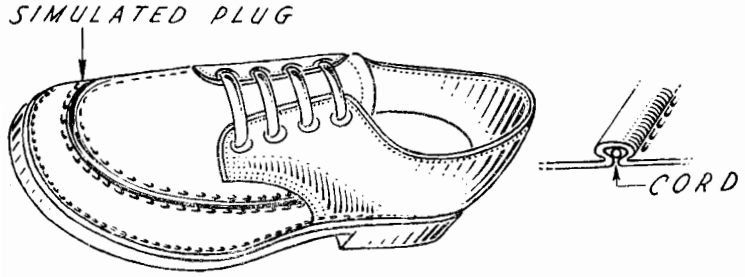


Fig. 67. Cord stitched around underside of vamp.

the vamp. The edges are usually beveled for a smoother appearance. The saddle seam is also highly popular; the edges of the vamp and vamp plug are drawn up and stitched together (Fig. 66). To achieve the effect of a vamp plug, a simulated plug may be made by stitching the vamp around a cord (Fig. 67).

STANDARD SCREW PROCESS

The Standard Screw Process is used mainly in the manufacture of heavy-duty work shoes. The process originated with a French inventor whose machine drove the screws into the double sole of these heavy shoes.

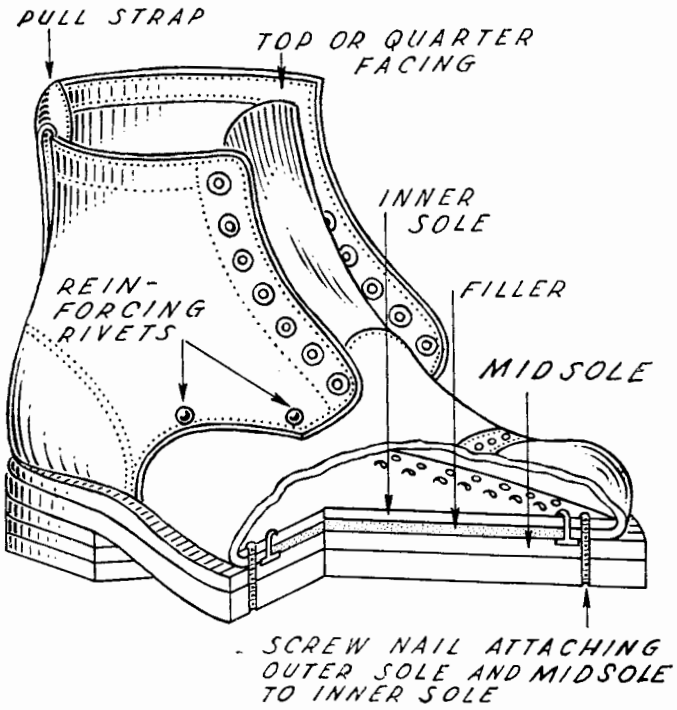


Fig. 68. Standard-screw shoe.

The uppers are made either lined or unlined. In this type of shoe the seams are often reinforced with rivets particularly in the places where there is likely to be strain.

The first steps in the construction of the Standard screw shoe are the same as in the McKay. The uppers are lasted (pulled tightly and fitted over the last) and fastened permanently to the inner sole with lasting tacks. The shank and filler then are placed in position.

This shoe, which usually has heavy uppers, needs an extra heavy sole to give the shoe the proper balance. To provide the necessary weight, a midsole is added between the outer and the inner sole.

The outer sole and midsole are cemented together. They are fastened to the shoe by a machine that measures, cuts, and drives a helically-threaded wire through the three thicknesses of soles. The wire ends up against the steel-bottomed last over which this type of shoe is made (Fig. 68).

This method has been largely replaced by the nailed shoe which is fastened with nails instead of wire screws.

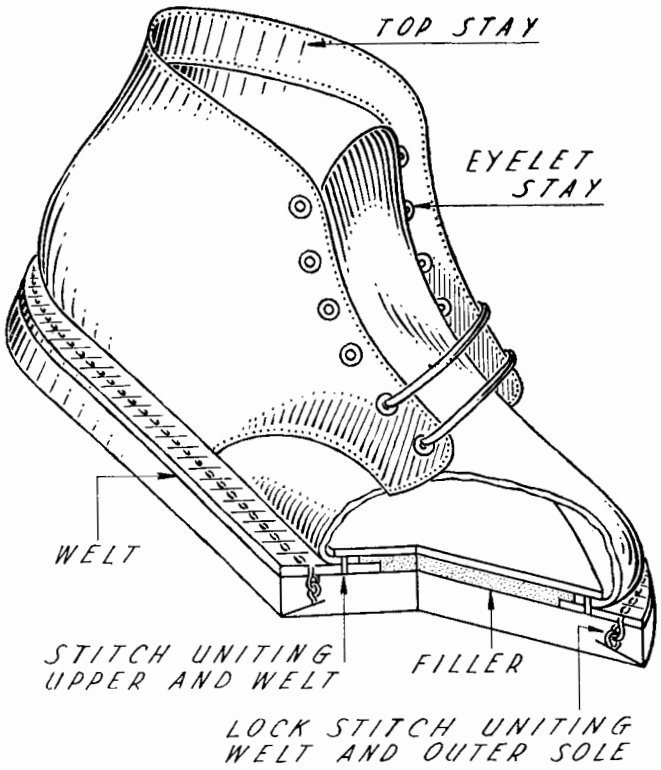


Fig. 69. Prewelt shoe.

PREWELT

In the prewelt method of shoe construction, the welt is attached to the tops, or uppers, with a chain stitch, before lasting (Fig. 69). This type of construction is used mostly in infant's shoes which do not have a heel. The welt, therefore, extends all the way around the shoe.

The uppers with welt attached are placed over the last to which a light inner sole has been attached temporarily. The combined uppers, lining, and welt are now cemented to the underside of the inner sole, and a filler is placed in the resultant cavity.

The outer sole is cemented to the shoe bottom and then is stitched to the welt with a lockstitch.

The several steps in the construction of this shoe, reversed, are as follows:

The outer sole is attached to the welt by cement and a lockstitch; or a permanent attachment may also be made with all-purpose cement.

The welt is attached to the uppers with a chain stitch.

The inner sole is cemented to the shoe.

Thus, there are no seams or metallic fasteners in the shoe to come in contact with the foot or to stiffen the shoe.

PEGGED SHOE

The pegged method of construction was used in the manufacture of a large variety of shoes in the days when machine shoemaking was very new. But, since the vast improvement in shoe machinery and the development of many new methods of shoe construction, very few shoes are still made this way. Most of these are either heavy work shoes or boots.

Before we had machinery for the manufacture of shoes, holes were punched in the soles with an awl, into which wooden pegs were driven. That is why this tool is called a *pegging awl*, although it is still used by some shoemakers to make holes for iron nails.

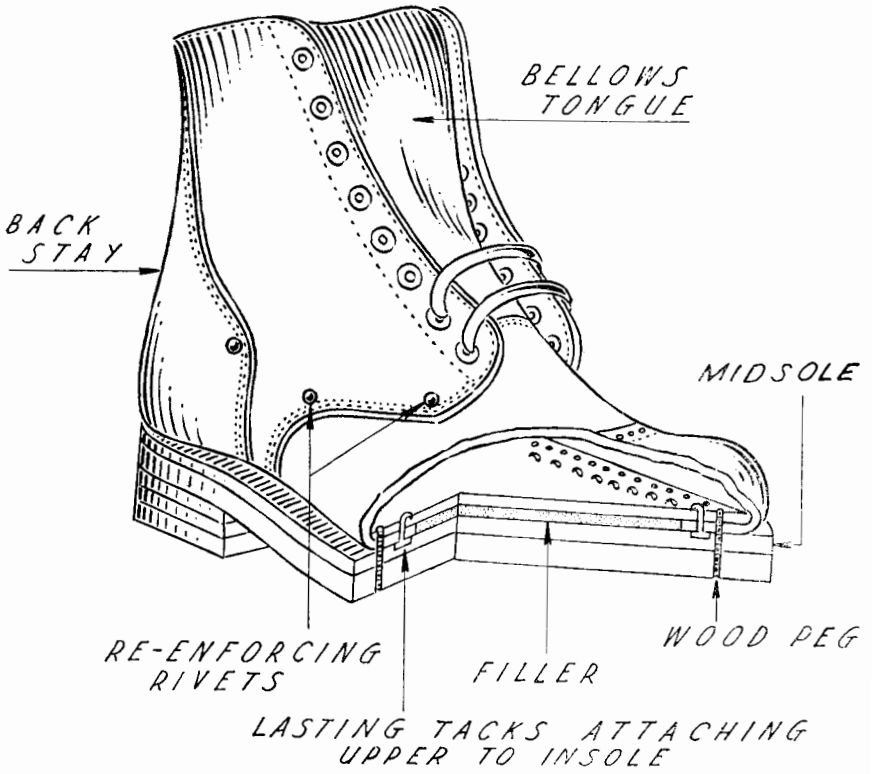


Fig. 70. Modern pegged shoe.

The old shoemaker would sit at his bench with a boot or shoe across his knee ready for pegging. One end of an endless strap was placed around the shoe and the other end was held down with the shoemaker's foot. The shoemaker then would peg the shoe by hand. A good workman became such an expert in the art of pegging that he seldom cracked or broke a peg. To remove peg ends which extended through the insole, he used a long-handled rasp called a *pegfloat*.

The modern pegged shoe is made somewhat differently (Fig. 70). The lasting, however, is the same, in that the uppers are tightly stretched over a steel-bottomed last and permanently fastened to the insole by means of lasting tacks. These tacks are driven through the insole and are clinched against the last.

A midsole is now cemented to the outer sole, and after the filler and shank have been put in place, the soles are fastened to the shoe with nails.

The pegging, which follows, is done with a machine which measures, cuts, and drives the pegs, as well as removes such parts of pegs as extend through the insole. This is all done in one operation.

LITTLE-WAY

The construction of the little-way shoe is different from the McKay in only one step (Fig. 71). That is, under the sock lining there is a row of stitches as in the McKay but there are no lasting tacks. In the little-way

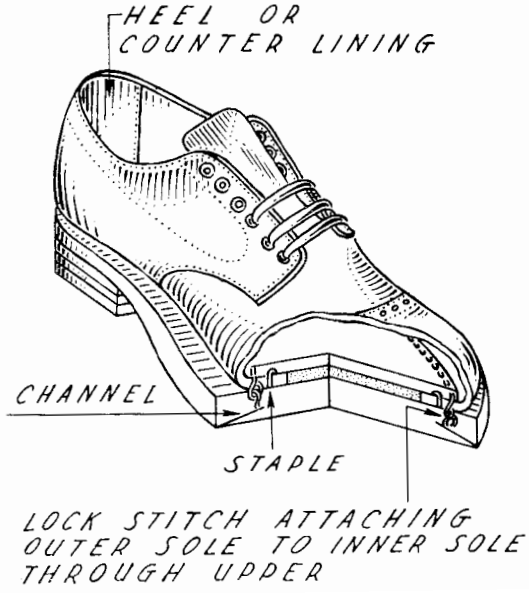


Fig. 71. Little-way shoe.

shoe, the uppers are attached to the inner sole with staples which do not pass through the inner sole.

This shoe also resembles the moccasin on the inside, but it differs in that it has an insole, which is not found in the moccasin.

The little-way, like the McKay, can be made in a number of ways. One method is to stitch a slipsole to the inner sole and then add an outer sole. This, in turn, can be stitched to the extended slipsole. This gives the completed shoe the appearance of a welt shoe.

TURN SHOE

This is one of the oldest methods of shoe construction and results in one of the most comfortable types of shoes. Few shoes, however, are now made this way because the method is too difficult.

As the name indicates, the shoe is made wrong side out. The last, then, is removed from the shoe which then is turned right side out. This is very difficult, as will be admitted by any old-time shoemaker who did hand shoe repairing when turn shoes were popular.

After righting the shoe, the last is replaced, the shoe is reshaped, the heel is attached, and the shoe is made ready for the finishing process.

This shoe requires no insole, because the inverted uppers are lasted directly to the outer sole. The outer sole, after it has been shaped, is

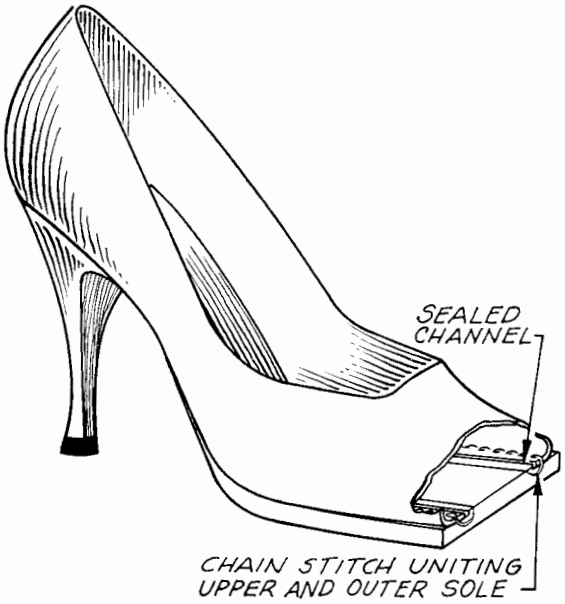


Fig. 72. Turn shoe.

temporarily fastened to the last, and prepared in about the same way as the inner sole in a welt shoe.

A rectangular groove is cut around the outer edge of the sole. Next to and just inside this groove a parallel channel is cut, which forms a shoulder to which the uppers are stitched with a chain stitch. The channel is sealed with cement as a protection to the stitching.

Very few shoes of this type are repaired at the present time by turning them because this is a very difficult job. Anyone who does this work must be specially careful to keep the original shape of the shoe, because, when the shoe is turned for repair, the work is done without the last over which the shoe was made.

Anyone who buys shoes labeled *Turn Shoe* can be assured of the finest quality in footwear because only the best materials can be used in shoes that are turned.

REVIEW QUESTIONS

Welt Shoe

1. Why is the welt shoe very popular?
2. What are the several steps in the construction of this shoe?
3. How is the inner sole prepared and attached to the shoe?
4. What does the operation *lasting* mean? What does the work consist of?
5. What is a welt? How is it attached? Name three types.
6. What is a shank? Why is it placed in a shoe?
7. What does a filler do to a shoe?
8. Why is a slipsole used in some shoes?
9. What material is used for outer soles?
10. How are outer soles attached? Describe a lockstitch.

McKay Shoe

11. What is the difference in construction in the several types of McKay shoes?
12. How is the outer sole attached to the inner sole?
13. Of what material is the inner sole made? Does it need preparation before attaching?
14. What type of last is used?
15. How is the outer sole attached? What is the stitch called?
16. In what way do midsoles and slipsoles differ?
17. How is the stitching in the sole reinforced?
18. What is necessary in a double-sole shoe that is not needed in a single-sole shoe?
19. How is the outer sole attached?
20. How can a McKay shoe be identified from a welt shoe?

Stitchdown Shoes

21. In what kind of shoes is the stitchdown method used?
22. How are the uppers made and finished?
23. How many types of stitchdown shoes are there? What are they called?
24. How are the soles attached?
25. How is the heel for the two-sole shoe made? What is it called?
26. What type of heels are frequently used on children's shoes?

Cemented Shoe

27. Why has this method of shoe construction been revived?
28. What kind of shoe is the result of this construction?
29. What kind of an inner sole is used? Of what is it made?
30. What is the real foundation in this shoe?
31. How are the soles attached?
32. How are these uppers sometimes lasted?

True Moccasin

33. What part of this shoe also takes the place of an insole? How is it positioned in the shoe?
34. In some of these shoes, the tongue is a continuation of what part of the uppers?
35. What makes this shoe fit more snugly than the original moccasin?
36. How many soles does this shoe have? What are they?
37. What stitches are used to attach the soles?

Imitation Moccasin

38. How is the imitation moccasin like the true moccasin?
39. How is the vamp plug attached to the vamp?
40. What kind of seam is used to attach the vamp plug?
41. What method is used to give the appearance of a vamp plug?
42. This shoe resembles what other type of shoe? Why?
43. Name three types of seams used in attaching vamp plugs.

Standard Screw Process

44. What kind of shoes are made by this process?
45. What kind of seams does this shoe have?
46. The first steps in the construction of this shoe resemble those in what other type of shoe?
47. What kind of soles does this shoe have? How are they fastened?
48. What process has generally replaced this shoe?

Prewelt

49. How is the welt attached? How far does it extend?
50. In what type of shoes is this construction mainly used?
51. How are the uppers and the inner sole combined?
52. How is the outer sole attached?

53. What type of stitch is used to attach the welt to the uppers? To attach the outer sole?

Pegged Shoe

54. What kind of shoes are made by this method?
55. For what purpose is a pegging awl used?
56. What kind of last is used in making these shoes?
57. How many soles does this shoe have? How are they fastened?
58. How is the pegging done?

Little-Way

59. How can this shoe be distinguished from the McKay?
60. What kind of fasteners are used in attaching the uppers to the inner sole?
61. Does this fastener pass through the inner sole?
62. What is the difference between this shoe and the moccasin?
63. How can this shoe be made to resemble the welt shoe?

Turn Shoe

64. Even though this type of shoe is one of the most comfortable, few shoes are made this way. Why?
65. Why doesn't this shoe have an insole?
66. How is the outer sole attached?
67. How are turn shoes repaired at the present time?
68. What kind of material is used in these shoes?

GENERAL QUESTIONS

1. Why are there different types of shoe construction.
2. Summarize the kinds of shoe construction discussed in this chapter.
3. Give advantages and disadvantages of each type of shoe construction discussed in this chapter.

CHAPTER 3

Resoling Operations Common to All Types of Shoe Construction

SELECTING MATERIALS

Good shoe repairing means more than just an artistic job. It means to restore a shoe to its original shape and appearance (Fig. 75).

Before beginning a resole job, regardless of the type of shoe construction, it is necessary that the shoe be examined for the materials needed and for its general condition. In spite of its importance, this first step is often overlooked (Fig. 76).

When selecting material for the soles, care should be exercised to get a quality that will be equal to the other parts of the shoe. When the shoe was made, the manufacturer did not only think of its appearance, but he built the foundation, and used the proper weight of threads and bottoms to correspond with the quality of material in the tops or uppers.

To do a good repair job, this balance in materials must be kept. The

Fig. 75. A repaired shoe.

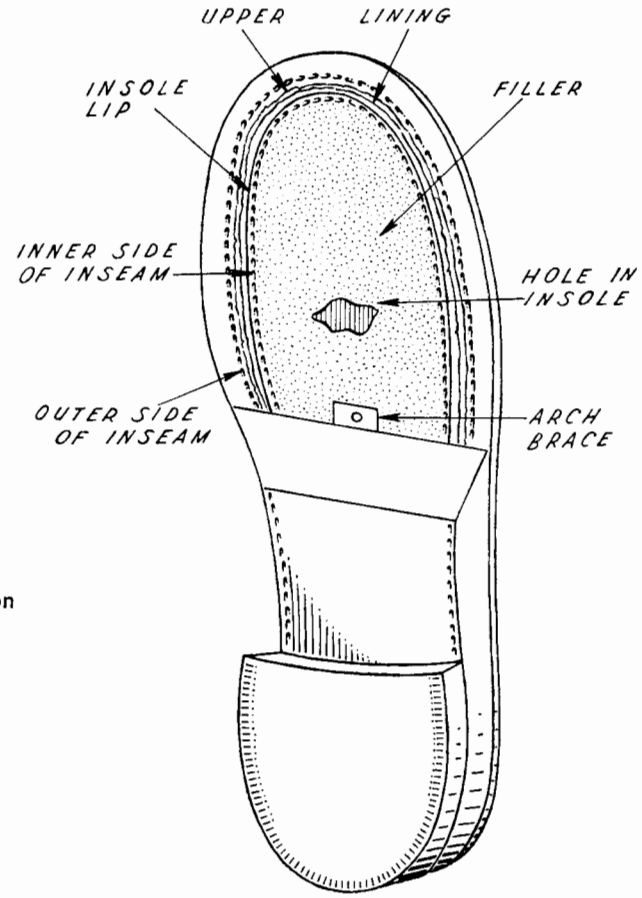


Fig. 76. Determination of shoe's condition.

easiest way to do this is to follow the manufacturer's blueprint, which in this case is the shoe to be repaired. The shoe should not be expected to be used for heavier duty than that for which it was originally made.

When a heavier sole is placed on a shoe than the one put on by its manufacturer, an extra burden is added to the foundation and seams which they are unable to carry. In addition to being too lightweight, these parts have been weakened by wear and weather.

The condition of the shoe now must be considered. Do not apply a good sole when the uppers are worn out. The customer will only be convinced that shoe repairing does not pay.

The customer sometimes asks for a lighter sole without thinking of the appearance of the finished job. In such a case, a good repairman will suggest using a sole of the proper weight but more flexible. If a lighter sole

is wanted because it would be cheaper, material of the same thickness as the old sole but of a poorer quality should be used.

These details may seem unimportant. By neglecting them, however, the appearance and durability of an otherwise excellent job may be completely ruined.

REMOVING OLD SOLES

The first step in resoling a shoe is to remove the old sole. This must be done very carefully because a great deal of unnecessary damage can be done to the rest of the shoe. Such damage results in a needless waste of material and time.

When removing old soles, no unnecessary force should be applied so as not to damage weakened parts such as inseams, insole lips, or the insole itself (Figs. 44 and 91).

Regardless of whether it is a single- or double-sole shoe, the sole should not be pulled from the shoe with a pair of nippers unless the attaching stitches have been cut, because the threads on the outer seams are much stronger than the others.

Ripping. To cut, or rip, the stitches which unite the sole and the welt, a hawkbill knife is very useful (Fig. 202). Of course, the repairman must know how to handle this knife. For complete control over the knife, it should be held so that the thumb is free to rest on the edge of the sole a few inches ahead of the blade, as when a knife is used for paring. This position steadies the knife when it is drawn toward the thumb, as shown in Figure 77. When an all-purpose cement attached sole is encountered,

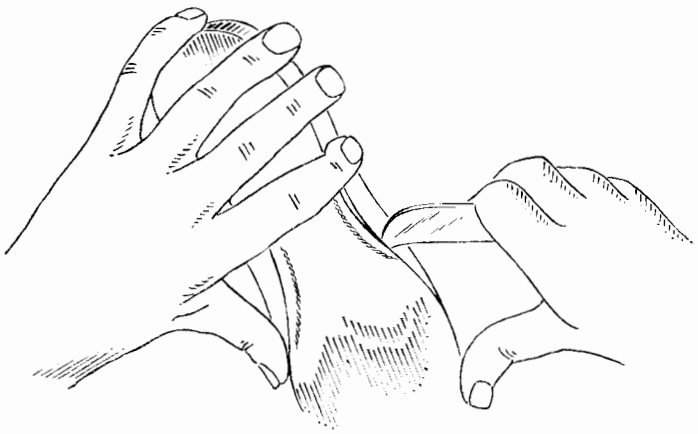


Fig. 77. Use of a hawkbill knife.

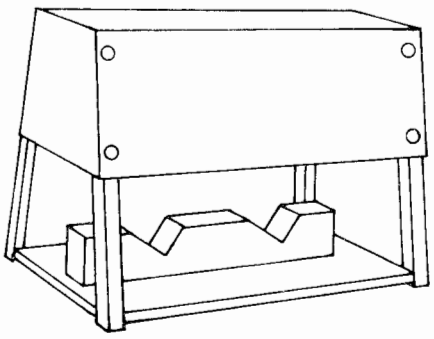


Fig. 78. Activator.

do not attempt to pull it off by force or you may do irreparable damage. Reactivate the cement by applying all-purpose cement thinner, or heat the cement by placing the shoe into an activator (Fig. 78) for two to four minutes. No more of the sole than will be cut away should be ripped. Ripping should begin and end, in most cases, behind the ball of the foot (Fig. 79). After ripping, that part of the sole can be cut away and used

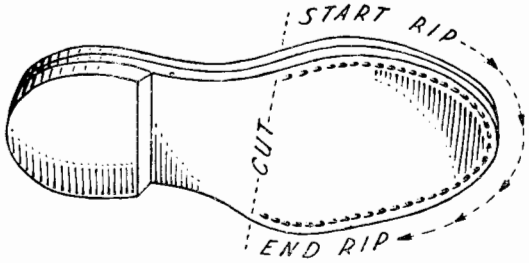


Fig. 79. Area of ripping.

as a pattern. The sole should never be cut before it has been ripped. If the sole has been fastened with reinforcing staples or tacks, force should not be used in loosening it because the tacks may be clinched in the lip of the insole or in the threads of the inseam. Tearing these would cause a great deal of damage. The stitches should be cut as far as possible. The sole should be raised enough to insert the tip of a pair of diagonal cutters (Fig. 218) to cut the metallic fasteners. The embedded pieces of the fasteners can be removed after the sole has been cut away.

LENGTH OF HALF SOLES

In Figure 80 the letters refer to the following:

A is the normal wearing surface.

B is the lowest normal wearing point.

C is the point of strain when bending the foot.

D is the proper length and angle when bending the foot.

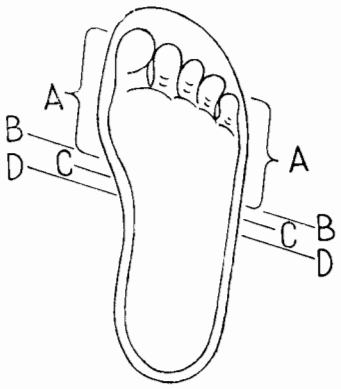


Fig. 80. Length of half soles.

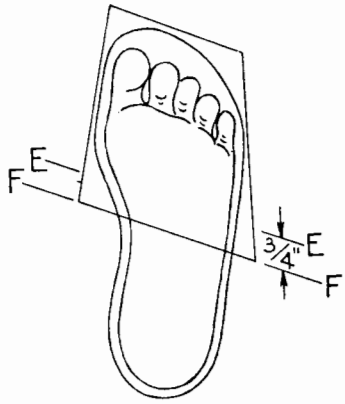


Fig. 81. Length of half soles.

E in Figure 81 is the point at which old soles should be cut off. It corresponds to point *B* in Figure 80 or just behind the ball of the foot.

F to *E* in Figure 81 is the taper or bevel which corresponds to point *D* in Figure 80.

NOTE: The taper from point *F* to *E* should extend not less than ¾ in. — preferably 1 in. Use a skiving knife to make the taper (Fig. 203).

The length of the half sole depends upon the particular shoe that is being repaired, because no two feet are alike. A person with short, low, or weak arches needs longer half soles than the average person. Therefore, care should be taken that the joint reaches well beyond the wearing point shown at *B*, Figure 80. At the same time, the half sole should not be longer than necessary because that would weaken the arch in the shoe. In that case it would be far better to repair the shoe with a full sole.

LENGTH OF FULL SOLES

The best results in resoling are had with full soles. With a full sole it

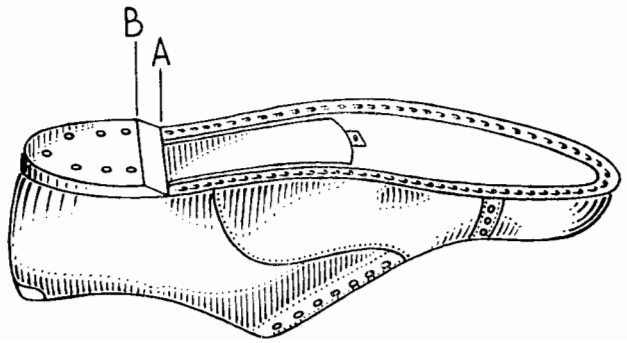


Fig. 82. Length of full soles.

is possible to restore a shoe to its original shape and appearance. Full soling also gives a repairman a better chance to make minor repairs which usually are not possible in a half-sole job.

On single-sole shoes a better job can be done if the old sole is cut away at the end of the welt as shown at *A*, Figure 82. Tapering of the sole then will begin as shown at *B*, Figure 82. Tapering there will bring the joined part just beneath the heel. This joint, if it is well tacked, and with the added reinforcement of the heel, is as strong as a full-length sole. This method saves material and time and will result in a better finished job by keeping the original heel seat.

On full, double-sole shoes, the soles should be allowed to extend the full length of the shoe, because on this type of shoe the heel seat will not be disturbed.

So that the old heel, or the good part of it, can be used again, it should not be forced off the shoe. Forcing the heel off will usually damage or ruin the heel and also will leave an unsightly permanent mark in the sole (Fig. 83). The best procedure is to remove one or two lifts from the heel.

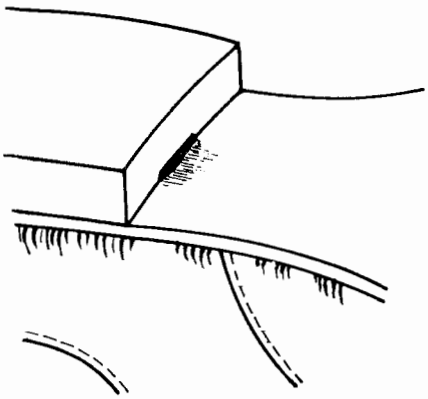


Fig. 83. Shoe bottom ruined by pry mark.

The nails then should be pulled out far enough so that the heel can be lifted off the shoe. This way the nails will still hold the heel together and at the same time they can be used in resetting the heel or to hold it in position while it is being nailed to the shoe.

CORRECT SOLE ANGLES

The inner arch (*A*, Fig. 84) is longer than the outer (*B*, Fig. 84). Therefore, the wear on the sole is further away from the heel on the inner side of the shoe. This is the reason that the sole wears through at a certain angle. The new sole must follow this angle.

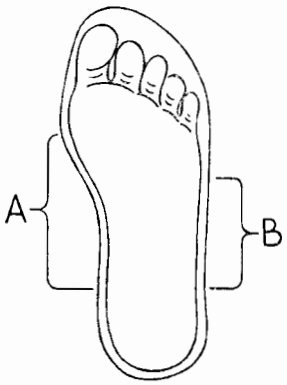


Fig. 84. Arch angles.

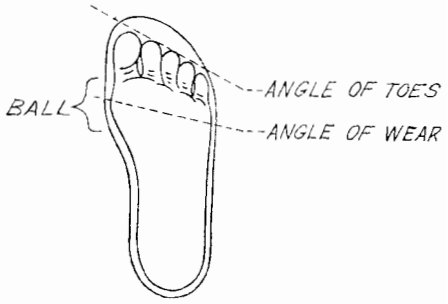


Fig. 85. Angle of wear.

The angle of sole replacement should follow the angle of wear, as shown in Figure 85 because this also is the angle at which the foot bends (C, Fig. 80). This can be more easily understood if it is remembered that this angle follows the angle of the toes.

PATTERNS

If the sole is to be cut from a bend (Fig. 253) or strip (Fig. 254) a pattern should be used. The best pattern is the old sole if it has not been too badly worn.

Before continuing, it may be well to read again the instructions under *length of half soles*, which states that the sole should be cut from the shoe

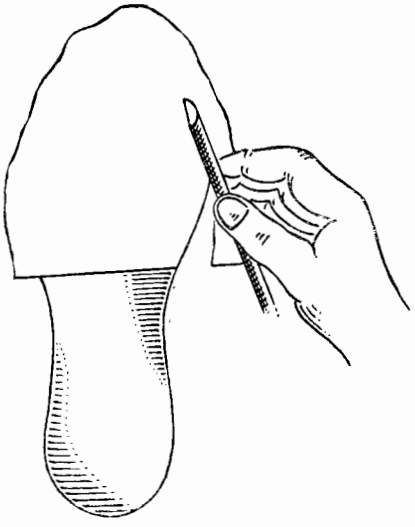


Fig. 86. Trimming sole.

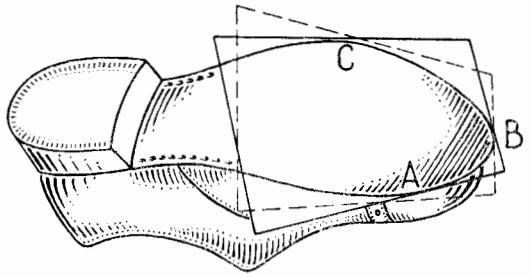


Fig. 87. Correct angle of ready-cut sole.

well behind the wearing point shown at *B*, Figure 80, or just behind the ball of the foot.

When the old sole is used as a pattern, allowance should be made for the taper at one end. The new sole, therefore, should be not less than ¾ in. and perhaps 1 in. longer than the pattern. If the old sole cannot be used as a pattern, one can be quickly and easily made of paper. A piece of paper can be placed over the bottom of the sole, with the straight edge at the angle and position shown at *F*, Figure 81. It is held with one hand and then is pressed down over the edge all the way around with the other hand, thus creasing it according to the shape of the sole. Cutting this paper along the crease will make a perfect outline and an excellent pattern.

A pattern can also be made by cutting the outline while the paper is held on the bottom of the sole. With a file or rasp (Fig. 222) cut along the edge of the sole with downward strokes, as shown in Figure 86.

If ready-cut soles are used, however, the piece of leather should not be placed in the position shown by the dotted line in Figure 87. This would make the sole too short and cut at the wrong angle. To get the correct angle and the proper length, the sole should be placed flush as shown at *A*, Figure 87. It should then be brought back flush at point *B*, and finally at point *C*, which will give the proper angle as well as the correct length.

MENDING WELTS

One of the most important jobs for a repairman is the checking and repairing of the welt and the inseam. The durability of the entire repair job depends upon these two items.

Damaged welts, even though the wear is slight, should be repaired, and inseams which show the least sign of weakness should be restitched, otherwise they will break away in a very short time. A shoe can be resoled without making these repairs, but the sole will come loose.

It is not necessary to replace entirely a broken or damaged welt. The damaged part should be cut out, and both ends of the remaining welt

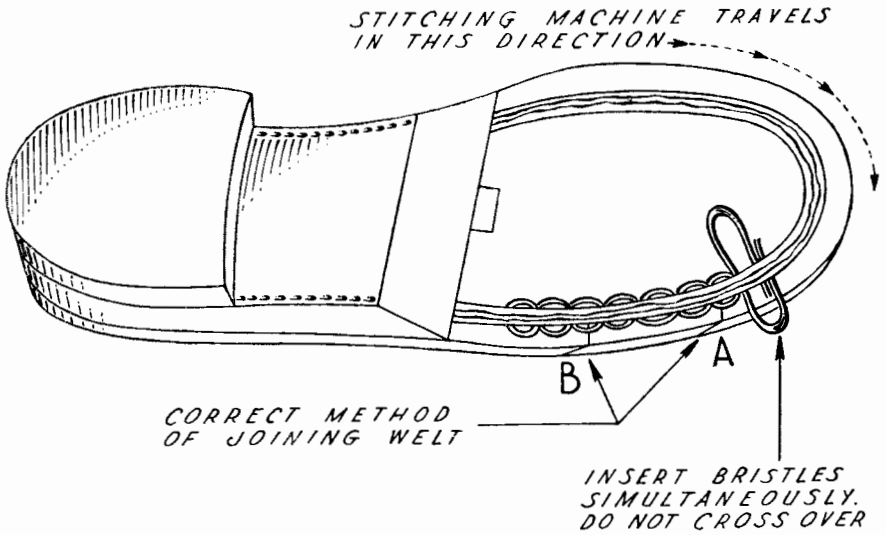


Fig. 88. Joining welts.

should be tapered for about ¼ in. A new piece of welt of the same thickness should be cut long enough to cover both tapered ends of the old welt. Both ends of the new piece of welt should also be tapered. The welt is then cemented into place.

Care must be exercised in joining the welts. The stitching machine travels from left to right, and if the lap is made incorrectly, the machine will catch on the new piece of welt and ruin the job. At that end where the machine stitching begins, the new piece of welt should lap over the old piece. The stitcher then will glide smoothly from the old welt to the inserted piece (*A*, Fig. 88).

At the other end, the new piece of welt should be inserted between the old welt and the uppers (*B*, Fig. 88). Here the machine again should be allowed to glide smoothly from the inserted piece to the old welt.

The welt now has been put in proper position and has been cemented. The next step will be to stitch it to the inner sole. First, a thread must be made, strong enough for the type and weight of the shoe on which it is to be used. Instructions for making this *waxed* thread are given in Chapter 11. For light soles, threads made of 4 to 5 strands are used; for medium heavy soles, 5 to 6 strands, and for heavy soles, 6 to 8 strands.

Holes through which the sewing is done are punched from the welt side. One end of the thread, which ends in a bristle as explained in Chapter 11, is inserted and pulled through a hole until the center of the thread has been reached. Then the next hole is punched, and both ends

with bristles are inserted through this hole at the same time from both sides. The threads are inserted at the same time, as shown in Figure 88.

The threads now are pulled through evenly, and if one of them sticks, it should not be forced through for fear of tearing off the bristle. The loose thread is pulled partly through the hole and then is pulled back, taking the tight thread with it by holding onto both while backing up the loose thread.

These operations should be repeated until the attachment has been completed, and the seam should be extended a few stitches beyond both ends of the joints, as shown in Figure 88.

Where the welt is merely loose or the inseam is weak, restitching should be done in the same manner as when attaching the replaced welt.

NOTE: The instructions on joining the welt are for standard, curved-needle stitchers. For straight-needle stitchers, of which there are several kinds, the lap joint should be reversed, because on this type of stitcher the shoe is held in an upright position.

PICKING STITCHES

When preparing a shoe for resoling or *rebottoming*, the old stitches should be removed whenever possible. If these stitches are not removed, they may be partly pushed up on the welt surface by the needle used in sewing the sole to the welt, and the resoled shoe will have two rows of stitches overlapping which will look ragged and certainly do not add to the appearance of the shoe.

On single-sole shoes, the stitches can be very easily and quickly picked out with a sewing awl (Fig. 89), if the repairman has no stitch-removing machine. If some of the stitches are so tight that they cannot be removed, they can be loosened and easily removed by dropping a little wax thinner on the stitches with a small oilcan or an eyedropper.

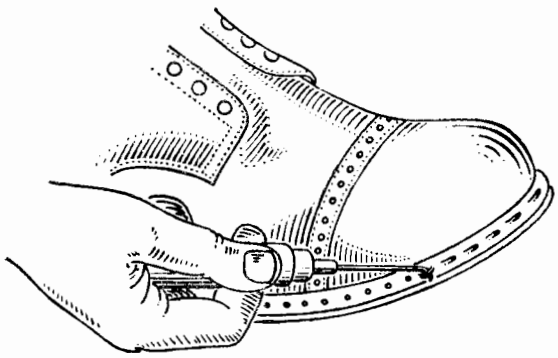


Fig. 89. Picking stitches from single-sole shoes.

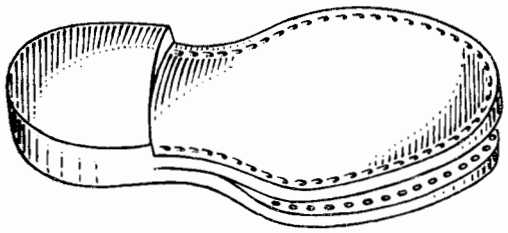


Fig. 90. Picking stitches from double-sole shoes.

On double-sole shoes, the operation is a little different. The seam between the welt and the midsole should be ripped — not between the midsole and the outer sole, as is often done. Then, by pulling the midsole away from the outer sole, the stitches will be pulled out of the midsole, as shown in Figure 90.

This makes the removal of the stitches from the welt much easier, because in this way the stitches are cut much shorter than they are when they are ripped between the midsole and the outer sole.

Before the midsole is replaced, both the welt and the midsole should be carefully roughened and then cemented in place. The roughing should be done by hand so as not to damage the inseam.

Before the outer sole is cemented in place, it is well to cement an antisqueak material, such as a small piece of cloth, to the midsole. Even though the midsole and the outer sole are carefully cemented together, it is possible that friction may take place and thus cause a squeak.

HOLES IN INSOLES

Holes worn through the inner sole (Fig. 76), generally at the ball of the foot or at the large toe, should be carefully mended. If the sole is not mended, the edges around the hole will curl or buckle. This will make the shoe very uncomfortable, and oftentimes it is not possible to wear the shoe.

If the hole is away from the edge of the inner sole, the filler should be cleaned away about ½ in. around the hole. The space then should be roughened so as to make a good holding surface for cement. A piece of leather, a little lighter in weight than the inner sole, should be cut to fit the roughened area. It should be tapered, or skived, to a very thin edge, and then cemented in place. The edges around the hole in the inner sole should fit tightly all around so that the patch and the sole form a smooth surface.

If the hole is on the edge of the inner sole, enough of the damaged or worn insole should be cut away to allow a new piece to be inserted

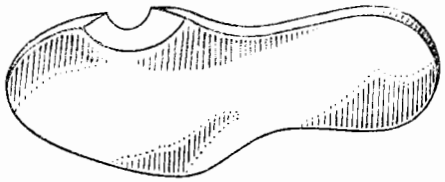


Fig. 91. Repairing inner sole.

(Fig. 91). The new piece should be cut to the same shape as the part worn away, and about ½ in. should be allowed all around for skiving. The edge of the section cut away on the inner sole also should be tapered about ½ in. Give the tapered edges on both the patch and the innersole a coat of all-purpose cement. Permit it to become almost dry (tacky) before attaching. Replace the upper and fasten it in the same manner as the balance of the sole.

Men's	3 Rib	Large	5	Inches
Number 2	Men's	Ex. Large	5¼	Inches
Men's	3 Rib	Medium	4½	Inches
Men's	3 Rib	Small	4¼	Inches
Women's	2 Rib	Number 7 Ex. Large	5½	Inches
Women's	2 Rib	Number 9 Large	4½	Inches
Women's	2 Rib	Number 11 Medium	4	Inches
Women's	2 Rib	Number 13 Small	3¾	Inches
Women's	1 Rib	Number 17 Large	4½	Inches
Women's	1 Rib	Number 18 Medium	4¼	Inches
Women's	1 Rib	Number 20 Small	3¾	Inches

SHANKS

Before attaching new soles, either half or full, the shoe should be carefully checked for broken or loose shank pieces. These pieces often come loose or break, in which condition they give no service. Damaged shanks will allow the arch in the shoe to sag, and as a result the wear on the sole will be very near the joint or directly upon it. Such wear will cause the soles to come apart at that point.

If the shank is loose, it should be placed in the right position and tacked to the inner sole at the front end, through a small hole in the metal. The back end seldom, if ever, comes loose. Before replacing the the old shank, however, flex it; if it does not spring back into position, replace it. If the shank is broken, all pieces should be removed, and it should be replaced with a new one, a little heavier (Fig. 92).

If a sole shows wear beyond the ball of the foot, it means that the wearer has weak arches or that the shank is not strong enough for the weight it is required to carry. Such shanks should be replaced with

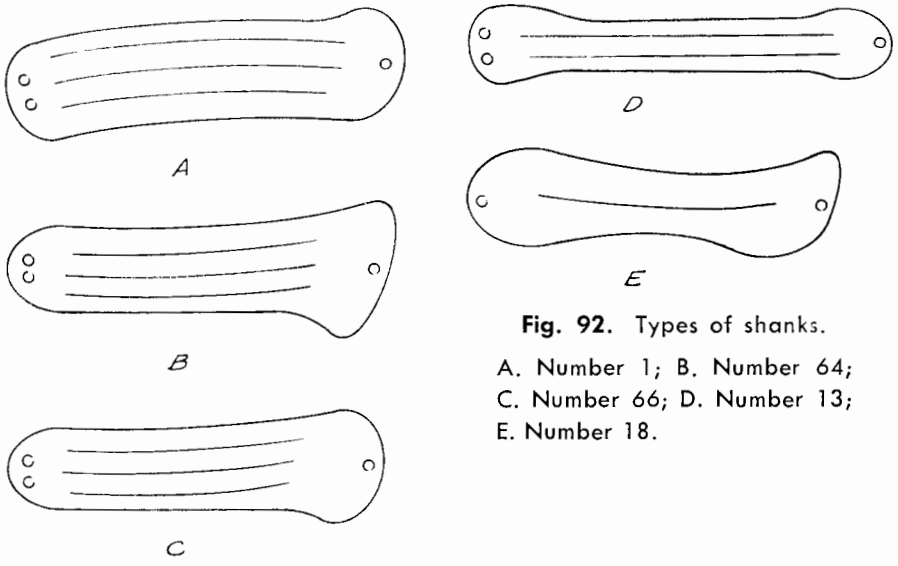


Fig. 92. Types of shanks.
A. Number 1; B. Number 64; C. Number 66; D. Number 13; E. Number 18.

heavier ones even though they seem to be in good condition. The wear and the comfort and shape of the shoe depend upon a firmly supported arch.

FILLER

The word *filler* is not the right name for this material because it does more than just fill the cavity between the inner sole and the outer sole. The filler must be waterproof, it must be a nonconductor of heat and cold, and act as a cushion to the shoe bottom (Fig. 49).

Many different kinds of materials have been tried out and are being used more or less successfully. Granulated cork, held together with various types of binder, has been found to be more satisfactory than solid materials because it can be forced into place leaving no unfilled cavities.

Even though this cork filler has been found more satisfactory than solid materials in many ways, the binder used with the cork cannot withstand the pressure of the foot. The cork particles therefore become separated and gather in places where there is less pressure, as between the ball of the foot and the toes. This forms uncomfortable bumps in the inner sole.

When resoling a shoe, therefore, all filler should be removed except that immediately around the edge of the sole where it joins the lip of the inner sole. The filler which remains acts as a protection and support

for the inner seam and cannot be as compactly replaced. The rest of the cavity then can be easily filled.

Another type of filler, which has been used for a long time and more than any other, is tarred felt. It has been very satisfactory. It can be bought in large sheets from which pieces can be cut to size and fitted into the cavities.

REVIEW QUESTIONS

Selecting Materials

1. What does good shoe repairing mean?
2. What kind of material should be selected for all parts of a shoe?
3. When resoling, what will a sole that is too heavy do to a shoe?
4. What must be taken into consideration when material for a new sole is selected?
5. What should be suggested by a repairman when a customer asks for a sole that is too light? Or too heavy?

Removing Old Soles

6. Why should care be exercised in removing old soles?
7. When is it permissible to pull an old sole from a shoe?
8. What kind of knife should be used for ripping? How should it be used?
9. How much of the sole should be ripped?
10. How should a sole attached with metallic fasteners be removed?

Length of Half Soles

11. How far should half soles extend back of the worn part of a sole?
12. Where on the sole does the strain of bending the foot come?
13. Why is it necessary to extend the sole beyond this point?
14. Why should not a half sole be made extra long?
15. What should be done if an extra long half sole would be necessary?

Length of Full Soles

16. What is meant by a full sole?
17. Why does a repairman prefer to do full soling rather than half soling?
18. On single-sole shoes, where should the sole be cut away?
19. How far should soles extend on full, double-sole shoes?
20. How should a heel be removed so that it can be used again?
21. In what way will a sole be damaged if not removed correctly?

Correct Sole Angles

22. What is the difference between the inner arch and the outer arch?
23. What effect does this have on the wear of the sole?
24. Why does the sole wear out at this angle?
25. Why should the sole replacement follow the angle of wear?
26. The angle of wear follows what angle of the foot?

Patterns

27. What is the best pattern for a sole when it is to be cut from a bend or a strip?
28. Where should the sole be cut from the shoe?
29. If the old sole cannot be used as a pattern, can a pattern be made in another way?
30. What methods are used to make this pattern?
31. If ready-cut soles are used, how should they be placed for trimming?

Mending Welts

32. Why should the welt and the inseam in a shoe be carefully checked?
33. Is it necessary to replace a broken welt entirely?
34. How should a welt be joined?
35. How is a welt stitched to the inner sole?
36. How are holes made for the stitching of the welt?

Picking Stitches

37. Why should old stitches be removed whenever possible?
38. How can stitches be loosened in the welt when they stick?
39. On double-sole shoes, which seam should be ripped?
40. Before the slipsole is replaced, what should be done to the welt and the slipsole?
41. What should be done to prevent the sole from squeaking?

Holes in Insoles

42. Where are holes usually worn through the inner sole?
43. What will happen if these holes are not mended?
44. How much should the insole patch overlap?
45. Why is it so important that the edges around the hole in the inner sole be securely cemented?
46. Can an inner sole that is broken or badly damaged along the edge be repaired? How?

Shanks

47. Why is it important to fasten a loose shank?
48. What will a damaged shank do to the sole of a shoe?
49. How is a loose shank fastened?
50. What does a sole worn beyond the ball of the foot indicate?
51. What does a firmly supported arch do for a shoe?
52. Why test a shank for temper?

Filler

53. Where is filler used in a shoe? What is its purpose?
54. Why is granulated cork preferred to solid materials in its use as a filler?
55. What happens when the binder used with the cork breaks away?
56. When resoling, what part of the cork filler should remain?
57. What other material has been very satisfactory as a filler?

CHAPTER 4

Final Resoling Operations and Finishing

The particular order of repair operations depends upon the type of shoe that is being repaired. This chapter discusses the various operations without regard to the order in which they may be done on the job.

JOINTS AND BEVEL

No matter how good the material is in a new sole or how excellent the workmanship, the entire job is worthless if the new and old soles have been carelessly joined. Above all things, this joint must be watertight. To accomplish this, the tapering or beveling on both the new and old soles must be carefully done so that the joint is even and smooth and both parts fit tightly together. No matter how the joint is made, it should be well cemented with pyroxylin or all-purpose cement. To produce a good job, the taper should be not less than ¾ in. long. If it is made shorter, it will break when put to use.

Both the new sole and the old sole remaining on the shoe should be so tapered that when they are joined together they will not form a raised seam. The completed joint should be no thicker than the new sole (Fig.

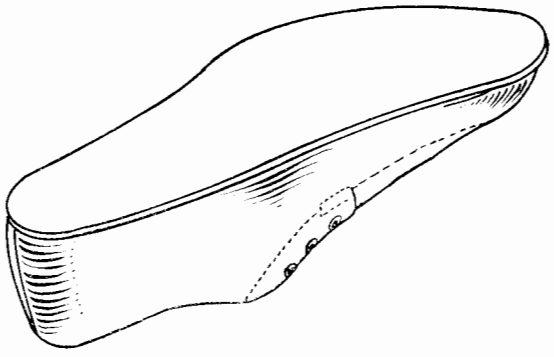


Fig. 95. Smooth joint.

95). After it has been scoured and finished, the joint should be so smooth that it cannot be felt by one's finger running over it. At most, a properly made joint will be visible to the eye as a hairline. Avoid making a joint that on the surface seems smooth but will show a crack when bent. Joints, if properly attached with pyroxylin or all-purpose cement, will not require nailing across the shank.

METHODS OF APPLYING SOLES

When a half-sole or a rebottoming job is being done, it is absolutely necessary that the rest of the shoe also be kept in mind. If the uppers have been left wrinkled or the shoe has not been restored as near to its original shape as possible, the appearance of the resoling job will be spoiled no matter how well it has been done. The manner in which new soles are attached has a great deal to do with the final condition of the rest of the shoe, without adding extra time and labor.

CEMENTING SOLES

No matter what type of shoe is being resoled – whether it is sewed or nailed – soles always should be well cemented. This will not only help in making a sole more moistureproof, but it will prevent a flimsy inner sole or welt from buckling while the sole is being stitched to the welt. Cementing also helps in attaching the sole to the rest of the shoe by holding the shoe in a straightened-out position when it is being stitched or tacked.

ROUNDED BOTTOMS

When the shoe comes in for repair, the sole will be rounded to a certain degree (Fig. 96). Part of the repair job is to reform the shoe so that it closely resembles a new shoe. The bottom of the repaired shoe should be straightened so that the wrinkles in the upper are removed (Fig. 97). The straightening operation is accomplished as the new sole

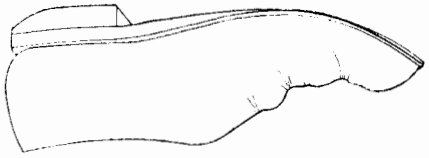


Fig. 96. Rounded bottom.

Fig. 97. Shoe should be straightened out when resoling.

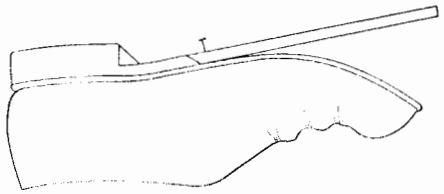


Fig. 98. Shank-first method.

is attached to the upper. There may be a slight curvature in the bottom, and the new sole may be molded so that it conforms to this curve.

FIRST STEPS IN ATTACHING SOLES

Two methods of attaching soles are in use; they are the shank-first method, and the toe-first method.

SHANK-FIRST METHOD

In the shank-first method of resoling, after cement has been applied, the skived ends and as much of the sole as is in contact with the shoe (Fig. 98) without bending the sole, should be pressed down and tapped with a smooth-faced hammer to insure a good bond. An added row of clinching nails should be used if it is a work or heavy-duty shoe. At this time, however, the forward half of the sole should not be pressed down because this would not remove the rounded bottom shown in Figure 96.

The heel end of the shoe should be raised away from the last so that the shoe can be straightened out, as shown in Figure 99. Thus the sole is pressed down and a nail is driven in the toe to help the cement in holding down the sole so that it will not pull away from the shoe while stitching.

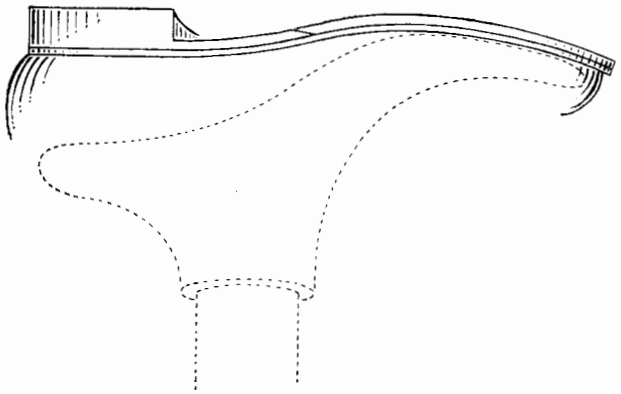


Fig. 99. Raising the the heel end away from the last.

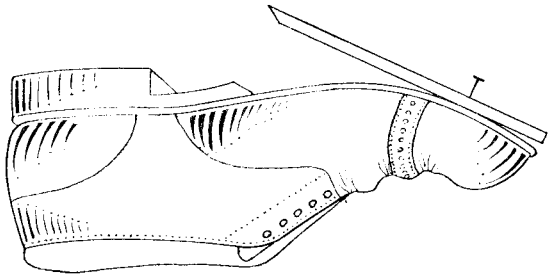


Fig. 100. Toe-first method.

TOE-FIRST METHOD

If the sole is first attached at the toe, as shown in Figure 100, it can be pressed or tapped down for quite a distance behind the toe. Now, if the fingers of one hand are placed under the tip of the shoe and the thumb is placed in the center of the sole, the shoe can be straightened out to the position wanted, while pressing it down. It will be held by the cement while being nailed down, without losing contact with the last, as shown in Figure 101.

A shoe can be straightened much more satisfactorily if first attached at the toe.

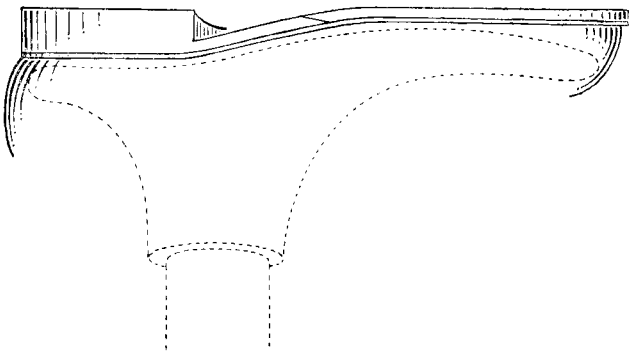


Fig. 101. Keeping the heel end on the last.

TOE PIECES

The toes of pointed-toe shoes often need repairing two or three times before the rest of the sole needs attention (Fig. 102). With the advent of extremely high, pencil-thin heels, this type of work has increased. The application of toe pieces has been greatly simplified, since they can now be rapidly attached by metallic fasteners (Figs. 316 and 321) or by all-purpose cement, or both in cases where shoes have been too badly worn.

Cut a piece of leather long enough to bring the joint beyond the point

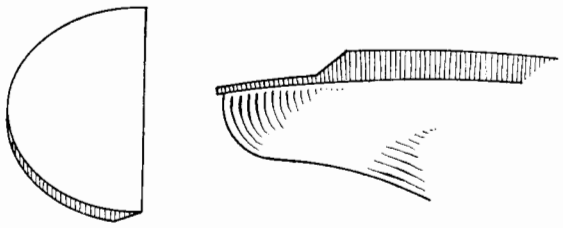


Fig. 102. Toe pieces.

of wear. Taper it to a feather edge and apply a coat of all-purpose cement. When the cement is tacky, apply it to the shoe and hammer it down all around. Trim and finish as you would a sole.

CEMENT

Cement manufacturers have made extraordinary progress in the past decade. They have produced a cement possessing pronounced cohesive qualities that make it a valuable asset to the shoe repair industry. By following the directions of the manufacturer and the general directions given below, you will be able to achieve excellent results every time.

If you have ever watched a painter or have had experience in painting, you know that in order to do a good job the surface must be thoroughly sanded to remove dirt, spots, etc. The first coat of paint usually does not cover the surface but is more or less absorbed in the wood. Painting and cementing are very much alike in that the first steps are the same for both. If these operations are not followed as directed, cement will not hold.

In order to have a satisfactory cement job, soles and shoe bottoms must be properly prepared by sanding or roughing to make a surface in which the cement can take hold (Fig. 225). Furthermore, all loose particles which cling to the surface must also be brushed away and removed, otherwise such particles will absorb the cement and prevent a firm bonding. This method pertains to all types of cements.

As with the primer coat in painting, the first application of cement should be thin and soft enough to flow freely and penetrate the leather fibers. The raised nap and porousness of the leather, and the penetrating qualities of the cement solvents, will cause this first coat to be almost entirely absorbed, and therefore it will have very little value as an adhesive.

If all-purpose cement is used, apply the prime coat to both the shoe bottom and the soles. Let it dry. Apply the second coat and lay the pieces aside to air dry for about 10 minutes or until tacky. Place the sole in position, and tap it with a hammer or, preferably, place it in a

press for about 2 minutes to insure contact in all areas. If the second coat dries prematurely, place the pieces in a cement activator (Fig. 78) until the cement becomes tacky again.

If pyroxylin cement is used, apply the first coat as before, being sure the amount is thinned down enough to penetrate the fibers. Let it dry, and then apply the second coat. Pyroxylin cement dries rapidly. While the cement is still tacky, place the pieces together. Then put the shoe in the press for 12 minutes to obtain a permanent bond. Remember that pyroxylin glue must *not* be heated. If it dries prematurely, apply another coat, or apply enough solvent to reactivate the dried cement.

CAUTION: With either type of cement, follow the instructions on the container carefully. Cements are highly inflamable and can be harmful with too long inhalation or skin contact.

TRIMMING

After a shoe has been resoled, the edges of the new sole must be trimmed. A cutter consisting of sixteen rapidly revolving blades is used for this purpose. Much skill and practice are necessary to use this cutter safely and correctly. It takes a light and uniform touch to make a smooth, even edge. The shoe is held firmly as shown in Figure 103. The right hand grasps the heel with the thumb over the top of the counter, the fingers around the bottom, and the forefinger against the shank. The left hand holds the upper. Trim the sole by pulling the shoe toward you with a sweeping continuous motion. Without stopping, round the toe by holding the shoe

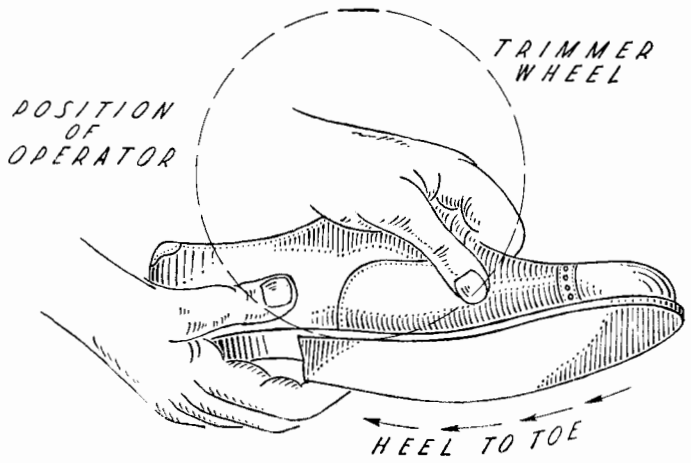


Fig. 103. Holding the shoe for trimming.

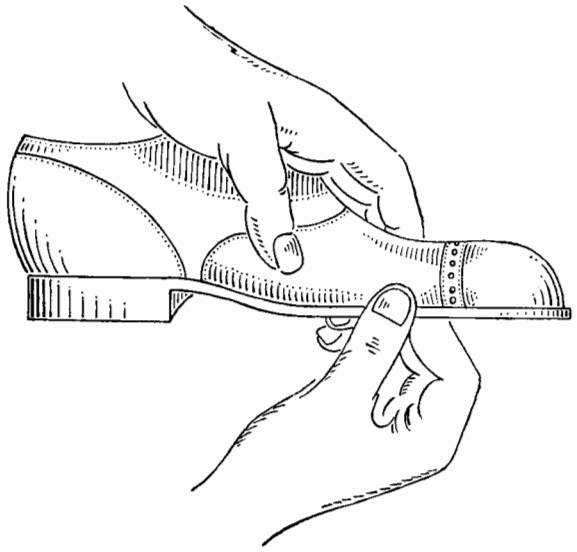


Fig. 104. Rounding the toe.

as shown in Figure 104. The left hand holds the upper as before, but the right is gradually moved forward to grasp the sole near the toe. Move the right hand to hold the toe as seen in Figure 10. Pull the shoe toward you, with the final cut being made from the toe toward the heel. The entire operation must be performed without stopping and with a smooth movement and even pressure. This is not the only way in which the shoe may be held for trimming. Use a method that suits you, re-

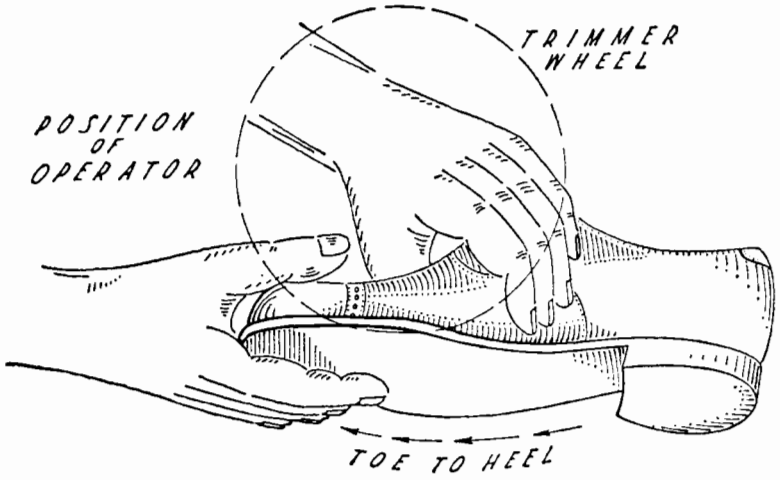


Fig. 105. Final trimming operation.

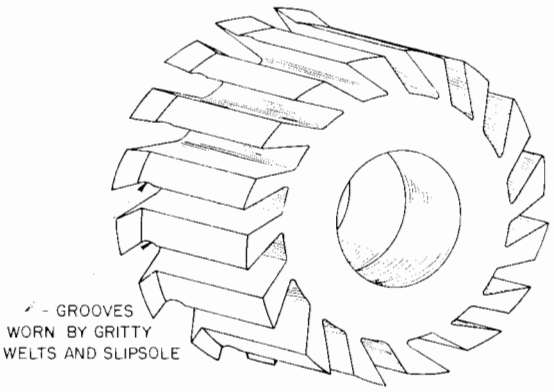


Fig. 106. Edge trimmer.

membering that a smooth even pressure is needed for best results. Though the toe and inside edge of the sole should always be trimmed straight, the outside edge may be beveled slightly, wider at the bottom than at the top.

EDGE TRIMMER

Proper trimming technique is useless if the trimmer blades are not correctly sharpened. Trimmers should be sharpened frequently, otherwise old welts and grit encrusted slipsoles will in a short time wear a groove into the trimmer. Be sure that each blade is sharpened with an equal amount of pressure to avoid uneven blades. Uneven blades will cause the cutter to grab or dig into and ruin the sole. Should the cutter grab, turn on the machine and hold a piece of chalk or white crayon ever so lightly against the revolving blades so that only the long blade will be marked. Grind this blade to the correct length. It is equally important to look for a short blade, one that is not marked when all others are. A short blade has the same effect as a missing blade and thus causes the following blade to dig.

BOTTOM SCOURING

The main reason for scouring the bottom of a shoe is to remove any material or substance that may interfere with the making of a smooth and evenly finished surface. Although this operation is not nearly as difficult as trimming, it takes considerable skill.

A light touch should be used when scouring because too much pressure will cut away too much wearing surface, destroy the life of the scouring paper, and scorch the leather so that it will be impossible to have an even finish.

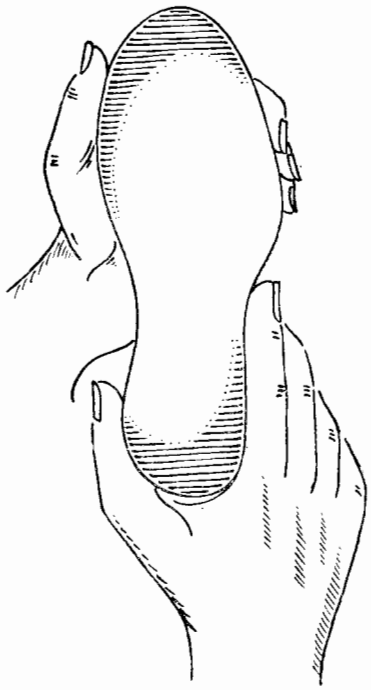


Fig. 107. Holding the shoe for bottom scouring.

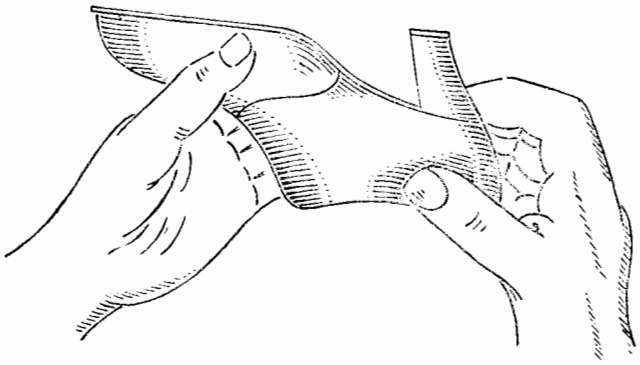


Fig. 108. Shoe swung parallel to finishing shaft.

Damp leather should not be sanded until it is dry because this will not produce a good finish. It may also clog the grit of the sanding material.

Scouring should be done with a long, sweeping motion along the entire length of the surface to be sanded. Unnecessary starting and stopping while scouring will make a wavy, uneven bottom.

To do this scouring, the shoe should be grasped so that the right hand circles the back of the counter and the front of the shoe rests lightly in the left hand, as shown in Figure 107. When the toe has been reached,

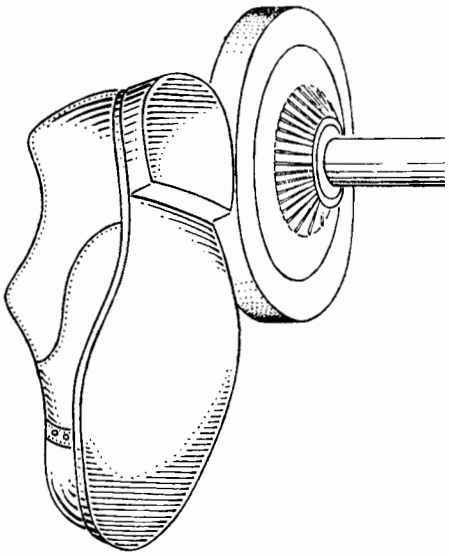


Fig. 109. First position in heel scouring.

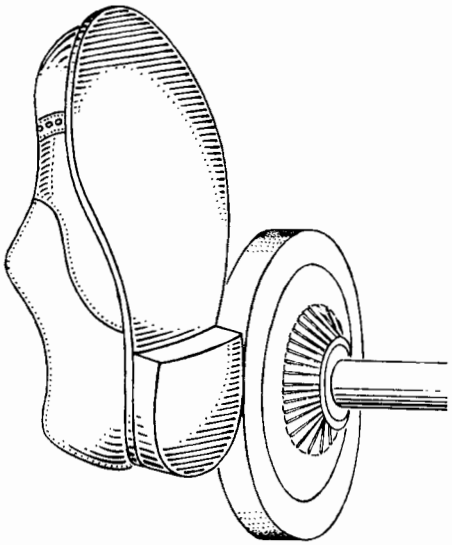


Fig. 110. Final position in heel scouring.

the shoe should be swung so that it is parallel with the finishing shaft, as in Figure 107. Scouring then should be continued around the toe until the original position of the shoe has been reached.

HEEL SCOURING

This operation is more than just scouring. Aside from having excess leather removed, the heel often must be reshaped. This takes quite a bit of skill. However, this procedure is necessary not only to produce a smooth, even surface, but also to have the shape of both heels alike.

A light touch is necessary for heel scouring for the same reason as when bottom scouring. When heel scouring, the operator should stand a little to the side of the scouring wheel rather than in front of it. This will give him plenty of room to turn the shoe, at the same time looking directly down upon it. He thus can see what he is doing during the entire operation. The shoe should be held in a vertical position with the toe down, and scouring should begin at the side farthest from the operator, as shown in Figure 109. The shoe is then rotated by moving the toe upward and toward the operator until the entire surface around the heel has been sanded, when the shoe again will be in a vertical position with the toe pointing upward, as shown in Figure 110.

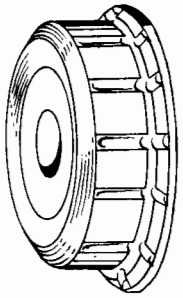


Fig. 111. Edge setter.

Without removing the heel from the sander, this operation should be reversed and continued back to the starting position, and repeated until the desired shape or smoothness has been obtained.

EDGE SETTING

Edge setting is a finishing operation performed on the edge of the sole whereby the edge is stained and waxed to the desired color and sheen. Edge setting is done after the trimming and scouring process has been completed.

A coat of burnishing ink is applied to the edges of the soles. The shoes then are set aside a few moments until the ink has penetrated the edges and dried.

It is necessary that the edges be permitted to dry because the ink contains a large amount of polishing wax in addition to the coloring matter. If the edges are brushed before they have dried, most of the wax will be removed.

The several steps followed in trimming the edges are repeated in burnishing. There is one difference, however, and that is, in burnishing pressure must be applied and must be repeated until there is enough friction to bring the edge to a bright, smooth finish. This operation is repeated, using more wax, until the desired gloss is achieved.

HEEL FINISHING

After edge setting, the heel is the next part of the shoe to be finished. Apply burnishing wax to the burnishing wheel (Fig. 112) by holding the cake of wax against the revolving wheel. Burnish the heel, holding and moving the shoe as in the scouring operation. Use a little more pressure to bring out a high gloss. Add more wax to the wheel as needed during the heel finishing operation. The procedure is repeated until enough wax has been worked into the surface of the leather to produce

a fine finish. The heel is then brushed lightly, first on a bristle or hair-brush to which polish is applied from time to time, and finally with a stick polish.

Occasionally one encounters heels that are hard to smooth down enough to get a good finish. To finish this kind of heel, shape and smooth it as much as possible. Apply a coat of fish glue, set aside, and when it is dry, smooth the heel down with a piece of fine or well-worn sandpaper. Apply the ink and wax, and finish it to a glassy smooth finish.

BOTTOM FINISHING

Shoe bottoms are finished in many ways and in many different colors. Black and brown finishes are generally obtained in the same manner as for heel finishing. After lightly sanding the bottom to insure good ink penetration, the desired color burnishing ink is applied, which when dry is burnished to a high luster. Additional wax is applied to the burnishing wheel as required. Black and brown as well as a variety of light color bottom stains, with suitable directions, can be obtained at your findings dealer. Bottoms can also be beautifully finished as men did years ago. The bottoms were sanded, creating a velvety texture, which was finished with a powdered chalk. Another beautiful finish was achieved by applying an emulsion made of gum tragacanth to the freshly sanded bottom. (Gum tragacanth can be purchased at a drug store and readily mixes with water. When applying, smooth the gum in one direction only.)

BURNISHING WHEELS

Average size shoe finishing machines come equipped with two burnishing wheels; larger machines have three. These wheels have a metal hub with a flange on one side and a threaded extension on the other.

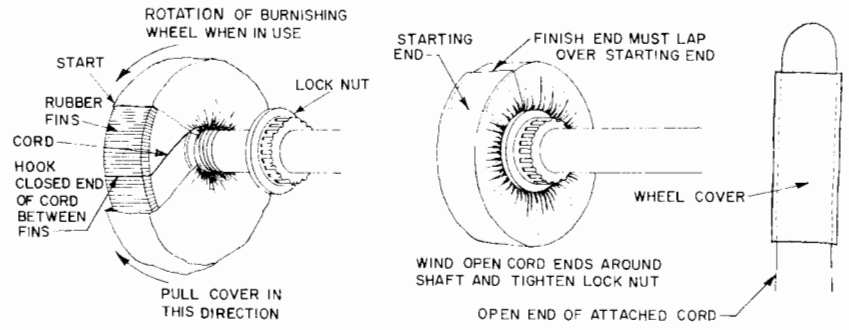


Fig. 112. Cloth covered burnishing wheel.

Another flange retaining nut is screwed onto this extension (Fig. 112). This nut must be screwed tight when the machine is running. To impart the necessary cushion, the wheel has a ribbed rubber tire. The wheel is covered with a burnishing cloth which is well waxed. These wheel (roll) covers are available in sizes to fit each wheel.

Along both sides of these is stitched a strong cord extending at one end, creating a loop.

1. Loosen lock nut (Fig. 112) and slide the wheel over just enough to remove the worn cover.
2. Select a cover to fit the wheel snugly. Lay it out so that the thread side is up and the loop end toward you.
3. Since the wheel rotates toward the operator, hook the loop into the fins of the rubber tire and bring it *up, over and around* the wheel (Fig. 112), ending by lapping *over* the starting end (Fig. 112). Be sure the cover fits well all around and has no wrinkles.
4. Slide the wheel back into position and wrap the two ends of the cord around the shaft.
5. Screw the other flange back gripping the wheel tightly so that the cover does not work loose when in use.

NOTE: Keeping the cover well waxed not only permits a better burnishing job, but will add considerably to the life of the cover.

FINAL INSPECTION

After all necessary reconstruction operations have been completed, all work, regardless of what it is, should be carefully checked.

Most important is the checking of both heels to make sure that they are the same shape and height, and both soles to see that they are uniformly trimmed. If there is the slightest difference the shoes may be considered as mismated.

All thread ends, both inside and outside of the shoe, should be carefully cut away. If they are allowed to remain, they can become very annoying as well as spoil the appearance of the shoe. The shoe should be carefully checked for protruding nails that may have failed to clinch.

A last check should be made for any other defects.

Finally, the shoes should be polished, and worn or frayed laces should be replaced. This will greatly improve the looks of the job and result in a well-pleased customer.

Check for nails or tacks that may not have clinched inside the shoe. Do not neglect to sew any rips and do not leave dangling thread ends.

REVIEW QUESTIONS

Joints and Bevels

1. How should the new and old soles be joined?
2. How long a taper or bevel should this joint have?
3. What is the most important thing about a joint?
4. How should the joint be sealed?
5. What should be the thickness of the completed joint?

Applying and Cementing Soles; Rounded Bottoms

6. If the rest of the shoe is not kept in mind when resoling, what will be the result?
7. On what types of shoes are soles cemented?
8. Why are soles cemented?
9. What should be done to a sole before attaching it?
10. What effect will too much molding have?

Attaching Soles — Shank-First Method

11. What are the two methods of attaching soles?
12. What must be done to a shoe with an exceedingly round bottom?
13. Which end of the sole must be pressed down and nailed first?
14. What is done with the heel end of the shoe?
15. What is done with the toe end of the shoe?

Toe-First Method

16. Where is the sole attached first in this method?
17. How much of the sole can be safely tapped or pressed down?
18. What is the difference between this method and the shank-first method?
19. What is the advantage in this method over the former?
20. After pressing down the front part of the sole, how can the rear part be correctly placed?

Toe Pieces

21. What area of women's shoes wears out most often?
22. Can this area be repaired without resoling the shoe?
23. By what means can the attachments best be made?
24. What is most important in this type of work?

Cement as a Permanent Attachment

25. For a satisfactory cement job, what is the first thing to do to soles and shoe bottoms?
26. In cementing, what is considered the priming coat?
27. What can be done to cement to make it more easily absorbed?
28. What does a binder coat consist of?
29. Why is one heavy coat of cement not enough?

Trimming

30. What tool is used to trim the edges of a new sole?
31. How should the shoe be held to begin trimming?
32. In what position are the right and left hands at the beginning of the operation?

Edge Trimmer

33. What happens to an edge trimmer aside from getting dull?
34. What happens if one of the blades is longer or shorter than the others?
35. How can one tell which blade is longer and which one is shorter?
36. How do you remedy a situation where one blade is shorter?
37. How will uneven blades affect a trimming job?

Bottom Scouring

38. What is the reason for scouring shoe bottoms?
39. What will be the result if too much pressure is used while scouring?
40. Why should not damp leather be sanded?
41. What effect will unnecessary starting and stopping while scouring have on the finish?
42. How should the shoe be held while scouring?

Heel Scouring

43. When scouring heels, what must be done to the shape of both heels?
44. What is most important when shaping heels?
45. What should be the position of the operator when scouring a heel?
46. How should the shoe be held while scouring?
47. How long should the scouring be continued?

Edge Setting

48. What kind of ink is applied to the edges of the soles?
49. What does this ink contain?
50. Why must the edges be dry before they are burnished?
51. The steps for holding the shoe in burnishing are similar to those in what other operation?
52. Why must pressure be applied in burnishing?

Heel Finishing

53. Heel finishing is similar to the finishing of what other part of the shoe?
54. How much pressure must be applied in burnishing?
55. How much wax must be used?
56. What kind of brush is used for the first burnishing?
57. What is used for the final brushing?

Burnishing Wheel

58. Why are these wheels covered with a cloth?
59. What is the purpose of the rubber tire?
60. Is it of great importance how this cover is put on? Why or why not?
61. The cloth creates the necessary friction, but what must be applied to the wheel to get a glossy lasting finish?

Bottom Finishing

62. How is a dark-colored bottom finished?
63. How is a light-colored bottom finished?
64. What method is used for all colors?

GENERAL QUESTIONS

1. List the typical steps in a resoling operation.
2. How important is resoling to the customer? To the repairman?
3. List the most important problems which arise in a resoling operation.
4. Give what you regard as the most important principles to be followed in a resoling operation.
5. Are there any differences of opinion regarding resoling? If so, what are they? What is your belief regarding these differences? Why?

CHAPTER 5

Assembled Operations Necessary in Repairing Shoes

Preceding and subsequent chapters contain complete information on how to determine the correct weights and grades of materials to be used in repairing the many types of shoes which are daily received in shoe-repair shops. Instructions have been given in what defects to look for and how to prepare a shoe for resoling. Various methods of applying and finishing replaced bottoms also have been given.

In the following pages, the various operations necessary to do resoling have been assembled and grouped under the various types of shoes.

WELT SHOE

1. Select the proper weight and grade of sole (see Selecting Materials, Chap. 3, and Correct Weight Soles, Chap. 11).
2. Cut the stitches between the sole and the welt, using a hawkbill knife (Fig. 202). Start and stop ripping at points indicated in Figures 77 and 78.
3. If soles are to be cut from a bend or strip, use the old sole for a pattern, or make one of paper (Fig. 86).
4. Check carefully for a damaged welt or broken inseam stitches (Fig. 76).
5. Examine the shank. Fasten it if it is loose, and replace it if it is broken or weak (Figs. 49 and 92).
6. Repair the insole or slipsole if either is worn through (Figs. 76 and 99).
7. Smooth out or replace the filler (Fig. 49).
8. Stitch all rips on the uppers. It is much easier to do this while the soles are off (page 100).
9. Taper (skive) the old and the new soles (Figs. 81–82).
10. Remove all excess flesh and loose fibers by buffing, and roughen the bottom of the new sole. Roughen the bottom side of the welt by hand.

11. Apply a liberal coat of rubber cement to the roughened side of the sole and welt, and permit the cement to dry.
12. When it is dry, press the sole into place. Be sure the shoe is straightened to its original shape during this operation (Fig. 97).
13. Nail it firmly across the shank, if all-purpose cement has not been used as a permanent attachment, use clinching nails (Fig. 228).
14. Trim away surplus leather, using a lip knife (Fig. 207). Trim even with the welt.
15. Cut a channel or groove into the sole for stitching (Figs. 56 and 223).
16. After stitching, seal the channel with rubber cement, or pound the stitches down lightly if they are stitched in a groove (Fig. 223).
17. Trim the sole edges (see "Trimming," Chap. 4).
18. If the leather is damp, permit it to dry, and then scour the bottoms (Figs. 107 and 108).
19. Apply a liberal coat of burnishing ink.
20. Permit the ink to dry and finish the bottoms.
21. Set the edges (see p. 65).
22. Brush well to bring out the luster.
23. Check the shoes for minor repairs (see "Final Inspection," p. 67).
24. Polish both the uppers and the bottom well.
25. Replace broken or frayed laces.

McKAY SHOE — SIMPLE TYPE

1. Select the proper weight and grade of sole (p. 40).
2. Remove the sock lining (see "Linings," Chap. 1, Fig. 22).
3. Make a paper pattern before ripping if the old sole is not usable (Fig. 86).
4. Cut the stitches between the uppers and the sole (Figs. 77 and 79).
5. Carefully remove the sole. Do not jerk the sole loose because the metallic fasteners are clinched on the inside of the shoe. Pull the fasteners out gently or cut them off (see p. 42).
6. Cut the soles to fit (Figs. 80 and 81, Length of Half Soles).
7. Taper (skive) the old and the new soles (Figs. 81 and 82).
8. See that the uppers are securely fastened all around (Fig. 54).
9. Check the shanks (Figs. 49 and 92).
10. Check the filler (Figs. 49 and 76).
11. Roughen the folded-under part of the uppers.
12. Remove all loose fibers from the bottom of the sole.
13. Cement both the uppers and the sole with rubber cement.

14. When the cement is dry, press the sole in position, but do not forget to straighten out the shoe (Fig. 96).
15. Tack the sole across the shank. Use clinching nails (Fig. 228).
16. Trim the sole to the correct shape, using a lip knife. Do this carefully as there is no welt to act as a guide.
17. Draw a line around the sole about ⅜ in. from the edge.
18. Select the correct length of clinching nails and tack the sole down, spacing the nails ⅜ in.
19. Trim, scour, finish, polish, and check as in the welt shoe.
20. Put in a new sock lining (Fig. 22).

The sole can be readily attached to this shoe with all-purpose cement.

McKAY SHOE — IMITATION WELT

1. Select the proper weight and grade of sole.
2. Check the sock lining. If it is wrinkled or damaged, remove it.
3. Cut the stitches between the imitation welt and the sole, using a hawkbill knife. Be sure to look for metallic fasteners which must be carefully removed.
4. Make a pattern of the sole (Fig. 86).
5. Cut the soles to fit.
6. Skive the old and the new soles.
7. Check the seam which attaches the imitation welt to the inner sole.
8. Check the shanks and the filler.
9. Roughen the sole and the welt, and cement them well. Soles may be applied to this type of shoe with pyroxylin or all-purpose cement since there is no danger of damaging an already badly strained and weather-beaten inseam.
10. Straighten the shoe, and press the sole in position.
11. Nail across the shank.
12. Cut away the surplus leather.
13. Cut a channel or groove into the sole for stitching.
14. Trim, scour, finish, polish, and check as in the welt shoe.
15. Replace the sock lining.

McKAY SHOE — DOUBLE SOLE

1. Select the proper weight and grade of sole.
2. Make a pattern of the sole (Fig. 86).
3. Cut the stitches between the midsole and the outer sole.

4. Cut the new sole to fit.
5. Skive the old and the new soles.
6. Roughen the midsole and the outer sole.
7. Cement a piece of cloth to the midsole. This cloth should extend to within ¼ in. of the edge of the sole.
8. Apply rubber cement to the sole and to the midsole, over the cloth.
9. Tack the shank; then stitch, trim, scour, finish, and polish as in the welt shoe.
10. Replace the sock lining.

STITCHDOWN — SINGLE-SOLE

1. Place the shoe or sandal on a piece of leather from which you will cut the soles, and mark the shoe all the way around.
2. Cut out the sole, shaping it along the line marked.
3. Rip the stitches between the extended uppers and the sole.
4. Sandpaper the bottom of the sole, and roughen the extended edge of the uppers.
5. Apply rubber cement to both the uppers and the sole, and permit the cement to dry.
6. Place the uppers in position on the sole. This will not be difficult if the sole has been accurately shaped. It is merely necessary to bring the edge of the uppers even with the edge of the sole all the way around, and then press them together.
7. Stitch, trim, scour, finish, and polish as in the welt shoe.

ALTERNATE METHOD

1. Make a paper pattern of the sole.
2. Thin the old sole to a light, uniform thickness.
3. Cement a piece of cloth to the old sole, as directed in step 7 under McKay Shoe — Double Sole.
4. Cut a new lightweight sole of such thickness that when it is combined with the thinned old sole, the two will not be heavier than the original sole.
5. Roughen the new sole, and cement both the old sole and new sole.
6. Place the new sole in position on the old sole and press them together.
7. Proceed further as directed for other shoes.

STITCHDOWN — TWO-SOLE

1. Select the proper weight and grade of sole.
2. Make a pattern of the sole.

3. Cut the stitches between the midsole and the outer sole.
4. Cut the new sole to fit the pattern.
5. Skive the old and the new soles.
6. Roughen the old and the new soles.
7. Cement a piece of cloth to the midsole.
8. Stitch the sole close to the edge. If stitched too far in, it will tighten the shoe, and during the process of stitching you may strike the staples in the shoe thus breaking the awl or the needle of the stitcher.
9. Trim, scour, finish, and polish as in the welt shoe.

CEMENTED SHOE

1. Select the proper weight and grade of sole.
2. Make a pattern of the sole.
3. Apply pyroxylin cement *solvent* around the edges of that part of the sole that is to be cut away, between the sole and the uppers, using an eyedropper or a small oilcan. Set the shoe aside to permit the solvent to loosen the old sole. Be careful not to apply the solvent to any part of the sole that is not to be removed.
4. Remove the old sole.
5. Cut a new sole to the pattern.
6. Skive the new and the old shoes.
7. Roughen the sole, and clean the turned-under margin of the uppers with solvent.
8. Apply soap or masking tape around the uppers bordering the roughened surface.
9. Apply pyroxylin cement to the shoe bottom and the sole and let it dry. While drying, the cement will penetrate the bottom and the sole.
10. After the cement has dried, if a heavy film of it remains on the surface of the sole and the shoe, apply a coat of solvent before placing the sole in position. If no cement remains on the surface, apply a light coat of cement, but be sure to spread it evenly and thinly.
11. Place the shoe in a press and permit it to dry.
12. Leave the shoe in the press for thirty minutes.
13. Remove the soap or tape.
14. Trim, scour, and finish as in the welt shoe.
15. Clean and polish the shoe, and replace the laces if worn.

ALTERNATE METHOD

1. Thin the old sole on the shoe considerably, making certain that the bottom and edges are uniform and even.

2. Be sure the entire area to be covered by the new sole has been properly sanded and cleaned of all dust particles.
3. Use a sole light enough so that when the new and old soles have been combined, the two will not make a heavier bottom than the original.
4. Apply a coat of pyroxylin or all-purpose cement to the roughened shoe bottom and new sole.
5. After the cement has become tacky, place the sole on the shoe and tap it down to insure that it will stay in position while it is being put in the press.
6. Proceed as in steps 11 to 15 of the previous method.

TRUE MOCCASIN

1. Select the proper weight and grade of sole.
2. Make a pattern of the sole.
3. Cut the stitches between the outer sole and the midsole.
4. Cut a new sole to the pattern.
5. Skive the new and the old soles.
6. Roughen both the old and the new soles.
7. Cement a piece of cloth to the midsole.
8. Press the sole in position.
9. Continue as in the welt shoes, steps 13 to 25.

IMITATION MOCCASIN

Compare the illustration of this shoe in Figure 64 with that of the welt shoe.

Since this is an exact duplicate of the welt shoe, the repair procedure will be the same.

STANDARD SCREW SHOE

1. Select the proper weight and grade of sole.
2. Make a paper pattern of the sole before removing it, because the old sole will be unfit to use as a pattern after its removal.
3. Insert a heel pry (Fig. 219) at the toe, between the outer sole and the midsole.
4. Loosen the outer sole sufficiently to get a good grip with nippers.
5. Pull the sole loose with the aid of the heel pry.
6. Cut off the nails which remain in the shoe.
7. Pound down the midsole to do away with the pry marks.
8. Skive the new and the old soles.

9. Roughen the midsole, and cement antisqueak material to it.
10. Roughen and cement the new sole.
11. Straighten the shoe, and press the sole in position.
12. Tack the sole across the shank, and trim the sole even with the midsole.
13. Draw a line around the bottom of the sole, ⅜ in. from the edge.
14. Select the correct length of clinching nails.
15. Tack the sole along the line drawn, spacing the tacks about ⅜ in.
16. After the sole has dried, trim the edges of the sole.
17. Scour the bottoms.
18. Apply a liberal coat of burnishing ink.
19. Burnish, or finish, the heels and bottoms.
20. Check the shoe for minor repairs to be made.
21. Clean and polish the uppers.
22. Replace worn laces.

This shoe also can be stitched in addition to nailing, which will add to its appearance and strength.

PREWELT SHOE

This type of shoe can be much better and more economically repaired by applying a full sole rather than a half sole.

Shoes made in this manner usually are small children's sizes, without heels. Therefore, the entire sole wears out evenly. For this reason, it would be a poor job of shoe repairing if any kind of joint were made in the sole.

1. Rip the stitches all the way around between the welt and the sole.
2. Remove all stitches from the welt.
3. Recement the uppers to the inner sole wherever loose.
4. Check the filler and the inner sole to make sure there are no bumps on the inner sole.
5. Should the inner sole have bumps, loosen the uppers all the way around.
6. Cut a new inner sole using the old sole as a pattern.
7. Apply rubber cement to the inner sole and uppers and permit it to dry.
8. Replace the inner sole, and press the uppers in position.
9. Refill the cavity between the inner sole and the outer sole with new filler.
10. Cut a new outer sole, using the old sole as a pattern.
11. Roughen the new sole, and clean the bottom part of the welt.
12. Cement the outer sole and welt, and permit it to dry.

13. Place the outer sole in position, and press the welt down firmly all the way around.
14. Trim the sole flush with the welt.
15. Channel or groove the sole for stitching.
16. Trim the edges all the way around.
17. Scour the bottoms.
18. Apply ink to the edges but not to the bottom.
19. Set the edges.
20. Clean the bottoms well and apply a light coat of bottom stain. Never wax the bottoms of infants' shoes.

PEGGED SHOE

1. Select the proper weight and grade of sole.
2. Make a paper pattern of the sole.
3. Remove the soles in the same manner as those on standard screw shoes.
4. These soles also can be easily removed, without damaging the balance of the shoe bottom, by prying the outer sole loose at the toe, then bending the sole back with nippers and cutting the pegs with a sharp knife or diagonal cutters (Fig. 218).
5. Remove all remaining peg stubs from the slipsole.
6. Plug up all holes in the shoe bottom with wooden pegs.
7. Roughen the slipsole, and cement antisqueak material to it.
8. Cut new soles to fit the pattern.
9. Roughen and cement the new soles.
10. Continue with the rest of the operations as directed for the standard screw shoe, steps 11 to 22 inclusive.

LITTLE-WAY

A comparison of this shoe (Fig. 71) with the simple McKay (Fig. 54) will show but a slight variation in its construction. The McKay shoe is lasted with tacks which pass through the inner sole, and in the little-way, the uppers are attached with staples which pierce but do not pass completely through the inner sole.

The procedure of repair in both types of shoes is the same.

The method of attaching soles, however, can be varied. Instead of tacking the soles, both the soles and the folded-under uppers can be roughened and attached to each other with pyroxylin cement. The rest of the procedure then would be as for the cemented shoe.

TURN SHOE

Very few of the shoes made in this manner are repaired by turning the shoe wrong side out. This is the way in which the shoe is constructed. It is very difficult to turn the shoe, and it is almost impossible to restore the shoe to its original shape without the last over which the shoe was made.

The most satisfactory method in resoling such shoes is by cementing the soles to the shoes, which will in no way change the appearance of the shoe.

1. Check carefully to see that the seam combining the sole and the uppers is in good condition.
2. Thin the old sole on the shoe considerably, and be sure you have a uniformly even bottom and edge.
3. Be sure the entire area to be covered by the new sole has been properly sanded and cleaned of all dust particles.
4. Apply a sole light enough so that when the new and old soles have been combined it will not make a heavier bottom than the original.

The procedure for resoling this shoe then is the same as for the cemented shoe.

NOTE: If the seam combining the uppers and the original sole is loose or broken, mend it as shown in Figures 156 to 159 inclusive.

GENERAL QUESTIONS

1. List the kinds of shoes in order of importance for a repairman's business.
2. Which type of shoe is most difficult? Why?
3. Which type of shoe is most easily resoled? Why?
4. What steps are common to the repairing of all types of shoes?

CHAPTER 6

Heeling

TYPES OF HEELS

Heels are prebuilt to various heights, sizes, and shapes, and are made of different materials for all grades of shoes. There are several types: leather, rubber, wooden, and plastic.

In leather heels, only the top layer, or *top lift*, is made of the best grade of leather, known as *top grade*. The rest of the heel sometimes is made of pieces of leather too small for any other use. Other materials used are paperboard, leather substances firmly pressed together, or solid layers of leather, usually belly stock.

When shoes are being manufactured, after the heels have been fitted for the correct size and height, they are attached to the shoe by a machine which drives all the required nails in one operation.

LEATHER HEELS

When repairing leather heels, the kind of material used must be taken into consideration. This is important because different materials have different finishing qualities, and a heel that does not have the same finish throughout will ruin the appearance of the entire shoe.

Oftentimes heels are repaired with chrome leather wedges or skivings which show a distinct difference in their finish. The use of wedges or

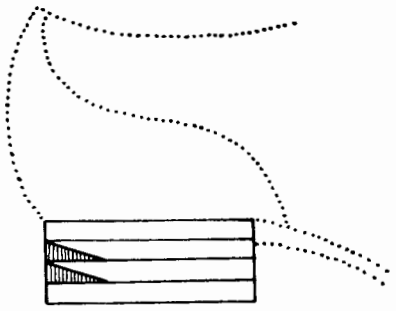


Fig. 115. Incorrect method of heel repairing.

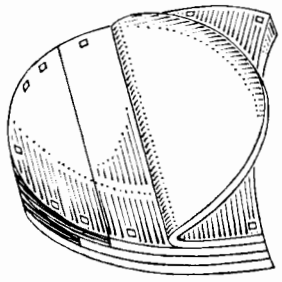


Fig. 116. Correct method of heel repairing.

skivings is not considered good shoe repairing because, no matter how well they may be cemented or nailed in position, the pounding that a heel receives in wear will cause these pieces to bulge out. The lines of such a heel, therefore, will not be even as those found in a new heel (Fig. 115).

The correct way to repair a heel, which requires no more time or expense than inferior methods, is to cut away the worn part of the underlift, and replace it with pieces of waste sole leather. Pieces of old soles which have been cleaned of filler and grit can also be used. This method of repair will not only hold the original lines of the heel but it will make a better wearing heel. When two or more under lifts need to be repaired and to make a good solid-built heel, the lifts should be staggered by cutting the lower replacement piece a little shorter, as shown in Figure 116.

Whether whole lifts or pieces are used, a liberal coat of cement should be applied between lifts. This will prevent cracks through shrinkage from frequent wetting.

Oftentimes repairmen cut away only part of the old nails, allowing them to project enough to go into the next lift. This should not be done because it has happened that such parts of nails have been forced through to the inside of the shoe.

RUBBER HEELS

The attaching of rubber heels is a large part of every shoe repairman's business (Fig. 117). Because it is one of the few "good profit" jobs which can be done in a hurry, it is often done very carelessly by a repairman who knows how to do a better job. It is merely a case of forming a bad habit which may creep into the rest of the repair work. No shop is so busy that time cannot be taken to rebox and replace a pair of heels that are found to be too large for a shoe, or properly prepare both shoe and heel before attaching the heel. A French-shaped heel never should be

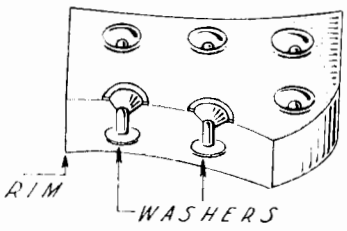


Fig. 117. Rubber heel.

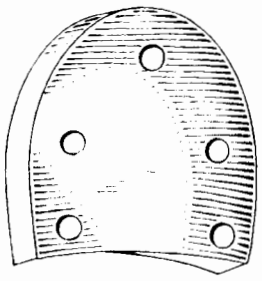


Fig. 118. Cuban rubber heel.

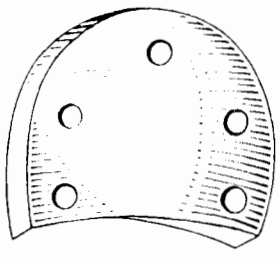


Fig. 119. French rubber heel.

made to serve the purpose of a Cuban heel, or vice versa (Figs. 118 and 119). Rubber-heel manufacturers have gone to great expense in making a large variety of sizes and shapes of heels. They have left only a few operations for the repairman which, if he follows them correctly, will result in a perfect repair job.

When half rubber heels are to be attached, the necessary number of lifts to equal the thickness of the rubber heel first should be removed from the leather heel of the shoe. Heel nails which extend then should be cut off, and the leather heel should be scraped and sanded smooth. Rubber heels usually are finished with a waxy glaze. This should be sanded from the surface which will be attached to the leather heel, but no more of the rim of the rubber heel than necessary should be removed (Fig. 117). The new rubber heel and the leather heel then should be cemented well and be permitted to dry thoroughly before the rubber heel is applied. Wedges should never be used to level a heel, especially not when rubber heels are to be attached. As mentioned before, rubber heels are made in many shapes and sizes; therefore, the right size should be selected because, if too much sanding is required to fit a heel, the completed job will be very unsatisfactory.

When full rubber heels are required, the old leather heel should not be removed with a heel pry or a screw driver, because this method leaves permanent indentations in the sole. The right way to remove heels is to lift off enough layers of leather, or *lifts*, as are necessary to reach the nails, and then pull the nails out.

When full heels are to be applied, the proper size should be selected, and before the glaze is removed from the rubber heel, the heel should be fit to the shoe to see whether the heel seat is too high in the center. The heel should fit tightly all the way around because cement should never be relied upon to hold it down. Nails should never be driven deeper into the rubber heel than necessary because they will draw the heel down and cause it to pull away at the edge.

Rubber heels are constructed with a metal washer in each nail hole (Fig. 117) to hold the nail from pulling out, and if either of these is clinched too tightly it will ruin the job. To avoid this trouble, some manufacturers are making heels with a wooden or metal plate throughout the center of the heel.

SPRING HEELS

Spring heels (Fig. 120) usually are found on children's and sport shoes, and are formed by a wedge under the sole at the front of the heel. These

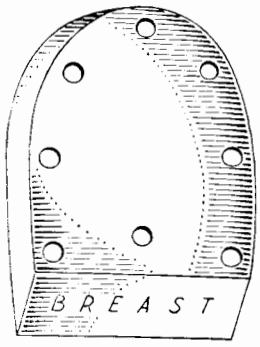


Fig. 120. Spring heel.

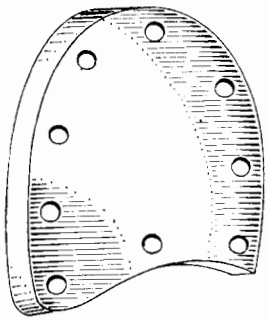


Fig. 121. Orthopedic heel.

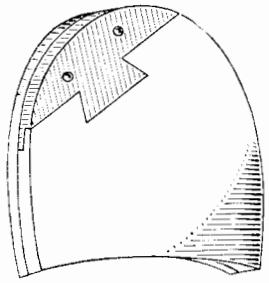


Fig. 122. Combination heel.

heels never should be attached without first carefully cementing them, especially at the breast or front of the heel, because this is the only means of holding the taper or bevel firmly to the shoe. It is well, when roughing the sole, to sand just a little beyond the amount necessary so as to remove the glaze. This will protect the thin edge of the bevel from stubbing.

ORTHOPEDIC HEELS

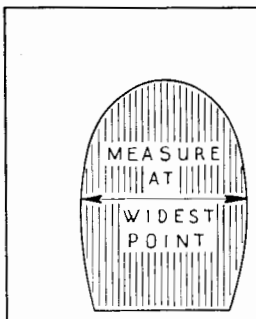
It is necessary at times to attach a pair of orthopedic heels (Fig. 121) the purpose of which is mainly to support the transverse arch. Therefore, these heels should be brought forward as much as possible. If it is necessary to rebuild the heel, the reason for doing this should be explained to the customer. Orthopedic heels are specially made for the right and left shoes. Be sure the long side of the heel is on the inner or longitudinal side of the shoe.

COMBINATION HEEL

Another type of rubber heel is the rubber insert or rubber plate (Fig. 122). Since the greater part of this heel consists of leather, it should first be cemented as all leather lifts should be before nailing. It should always be set far enough forward on the shoe so that all necessary trimming will be done from the leather, thus retaining as much of the rubber as possible, which is the only part of the heel that acts as a shock absorber.

WOODEN AND PLASTIC HEELS

Wooden heels have played an important part in the development of design and lightness in women's footwear, because they help keep the



SIZE NUMBER	WIDTH IN INCHES
4	1 11/16
5	1 3/4
6	1 13/16
7	1 7/8
8	1 15/16
9	2
10	2 13/16

Fig. 123. Wood heel sizes.

proper balance in these shoes (Fig. 123). The plastic heel has brought in new design possibilities by providing additional durability and strength. Oftentimes, however, a shoe that would have been attractive with a particular type of heel is ruined by the manufacturer when he substitutes another type of heel which will help lower the cost of the shoe. Many times an individual has heels changed on shoes that require a certain style, to another style or of different height, without considering the damage that may be done to the shoe as well as its comfort.

Heels should always be replaced with heels of the same height and wedge angle to conform to the lines of the shoe. For example, the heels in Figures 124 and 125 as well as those in Figures 126 and 127 never should be exchanged for each other because of the difference in pitch. This is shown by placing a piece of paper over both along the wedge of the heel in Figure 125. The difference in the wedge angle of the heel in Figure 124 thus is shown. Both height and wedge angle are most important in a heel. Heels which are replaced should follow the lines shown in Figure 128.

An examination of Figure 129 will show that the weight of the body

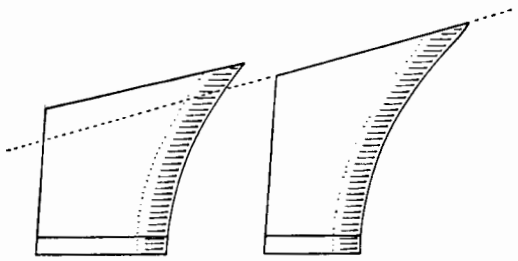


Fig. 124. **Fig. 125.**

Cuban heels: note difference in pitch.

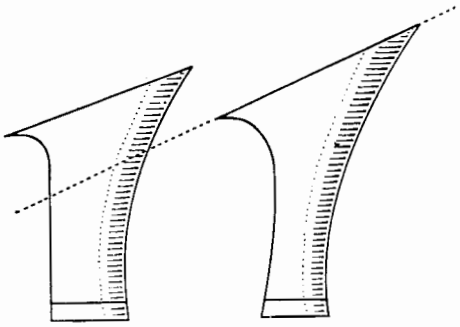


Fig. 126. Boulevard heel.

Fig. 127. Spike heel.

Note difference in pitch.

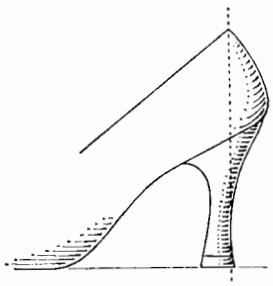


Fig. 128. Correct position of heel.

will force the shoe down at *A* until the heel sets level. This would break the arch of the shoe. It would also force the shoe forward at *C*, causing it to pinch or bind, at the same time forming a bulge at *B*.

Foot pressure between *A* and *C* on the heel shown in Figure 130 would force the counter back far enough to cause slipping at the heel and an ugly gap at *B*. In a short time the heel would become detached at *C*, and the arch brace at *D* would break away, thereby removing the entire support of the shoe and causing a complete breakdown.

PINCHING AT BACK AND BULGING AT SIDES

Many shoes pinch or bind at the back, as shown in Figure 131. Oftentimes an attempt is made to correct this trouble by inserting a heavy heel pad or by pounding or stretching the back, which gives temporary relief.

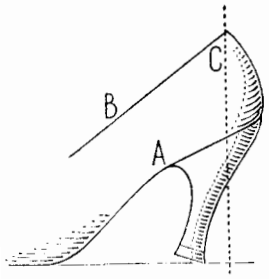


Fig. 129. Heel forced down will cause pinch at C.

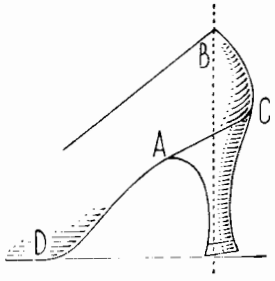


Fig. 130. Heel forced down will cause gap at B.

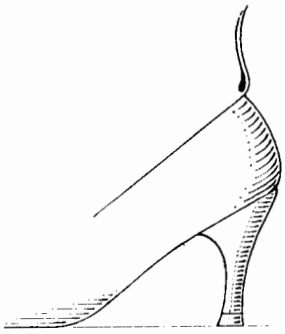


Fig. 131. Pinching at heel.

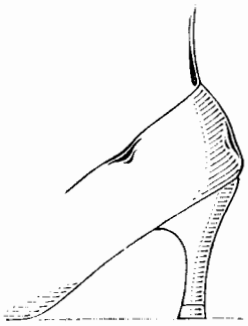


Fig. 132. Bulging at sides.

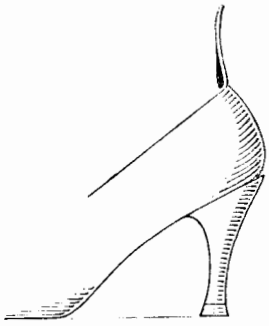


Fig. 133. Gapping remedied with nonslip lining.

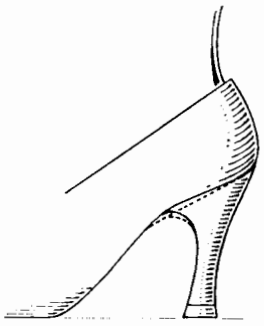


Fig. 134. Large gap at heel.

Neither of these methods, however, will correct the difficulty because they do not get at the source of the trouble, but will only lead to further difficulties, such as ripping or breaking of the stitches. The insertion of a heavier heel pad or heel cushion will only make things worse.

Another defect often found is a bulge at the side of the shoe as shown in Figure 132. The reason why a shoe pinches at the back and bulges at the sides is that the heel has too much wedge angle and therefore not enough support at the front of it. These difficulties may not become evident until some time after wearing the shoes, and then again they may show up immediately because of lack of support to a weak transverse arch. This situation can be corrected by replacing the heel with one having the right kind of wedge, as was done for other heel defects.

GAPPING AT THE HEEL

Very frequently shoes have faults which do not develop until after they have been worn, and cannot be corrected unless the reason for them has been found. One of these problems is the slipping or gapping at the heel. This difficulty may be very slight, as shown in Figure 133 and may be

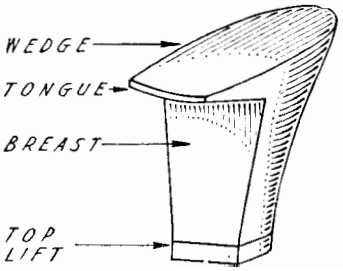


Fig. 135. Parts of a heel.

remedied by inserting a very light nonslip lining. However, where the gap is larger, as shown in Figure 134, the cause of the trouble should be found. Here, a heavier lining may prevent the shoe from slipping, but it will not do away with the gap. It may even increase the size of the gap.

Gapping usually is caused by a heel with not enough wedge angle, and does not show up until the shoe has had time to set to the foot. This can be corrected only by replacing the heel with one of accurate pitch. Correction should not be attempted by slanting the bottom of the heel because this will cause the heel to kick back (Fig. 130).

DOWELED HEELS

The exceedingly high narrow heels on women's shoes break frequently. When replacing worn top lifts, good shoe repairing demands careful selec-

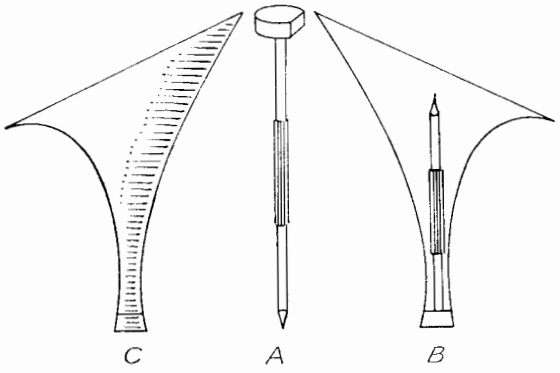


Fig. 136. Dowled heel — A. Dowel; B. Placement of dowel left; C. Finished appearance.

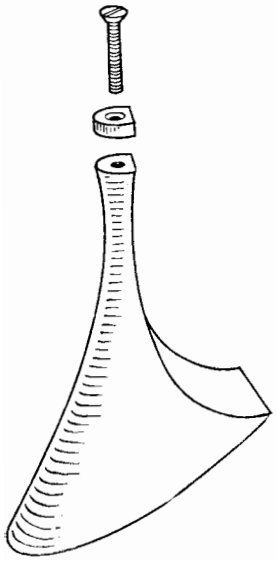


Fig. 137. Simple screw-type dowel and top lift.

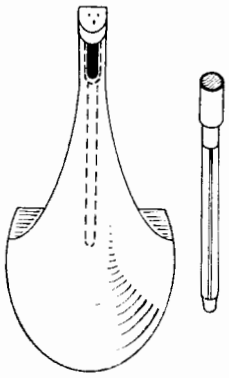


Fig. 138. Metal- and wood-core dowel with top lift.

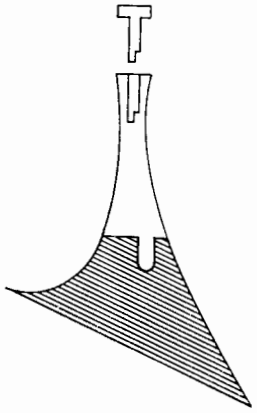


Fig. 139. Metal and wood heel.

tion of the type of dowel that will add strength to the heel (Figs. 136–139). Often the dowel will be hard to extract, however, it can be accomplished with little or no effort with one of the many dowel extractors available at your finders.

COVERING WOOD HEELS

One of the most profitable shoe repairing skills is the ability to re-cover the heels of women's shoes. About 45 percent of the over six hundred million shoes produced annually in the United States are women's shoes. Many of these require new heels for one reason or another. Some heels are replaced even before the shoe is ever worn. Others become broken or scuffed. Some must be re-covered to match the color of a new wardrobe.

The following steps, if observed carefully, will enable you to produce a top re-covering job:

1. The cover must be cut out with care. The finished job must have no wrinkles.
2. Leather stretches more in one direction than in the other. Cut the cover so that the greatest amount of stretch is from the top lift to the heel base.

Fig. 140. Positioning cover and heel.

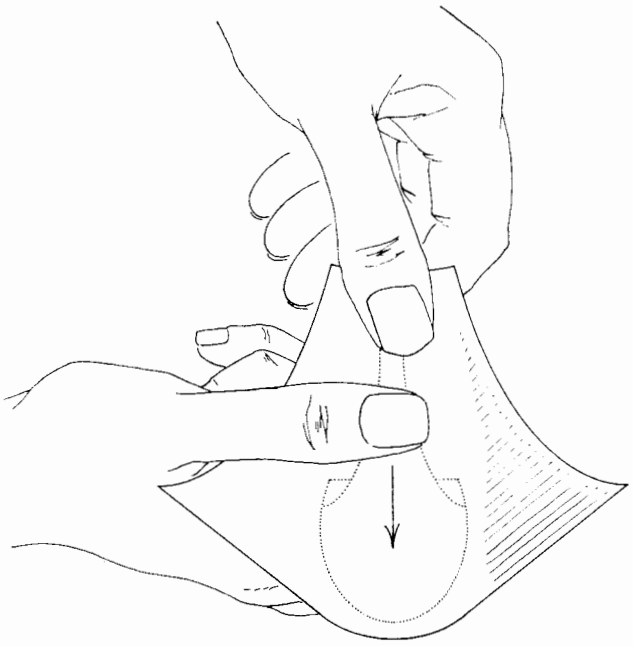


Fig. 141. Shaping cover to back of heel.

3. Give the heel and the cover a coat of rubber cement and permit it to become almost dry.
4. Position the heel as in Figure 140; be sure the cover does not stick to the heel, except where it is held under the thumb.
5. With the other hand, grasp the heel so that the forefinger rests on the

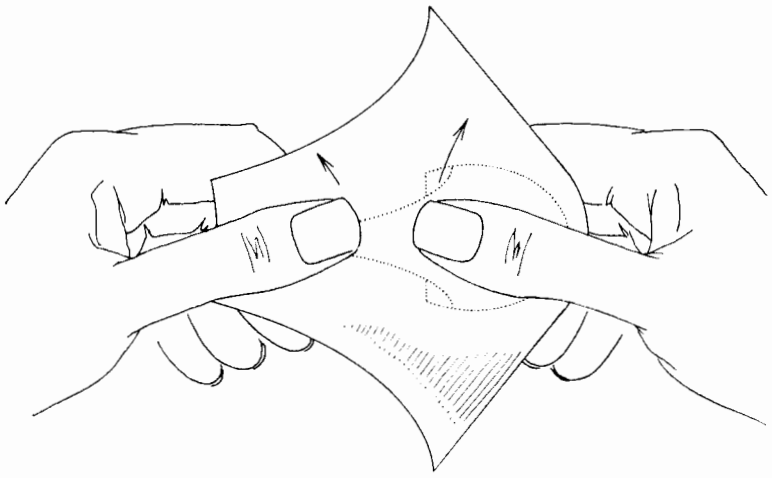


Fig. 142. Shaping cover to sides of heel.

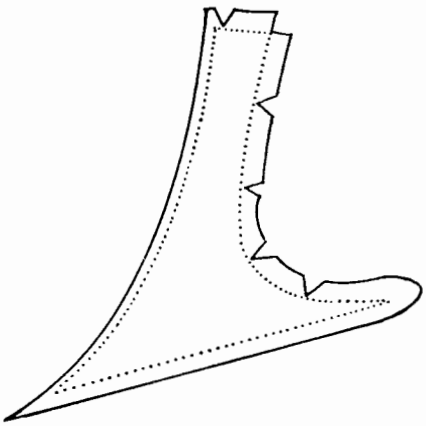


Fig. 143. Fitting cover to breast of heel.

base of the heel and the thumb on the back as shown in Figure 141.

6. Slide the thumb of the right hand along the back of the heel in the direction of the arrow, pressing the cover down to conform to the curve of the heel.
7. Grasp the heel so that the fingers of both hands rest upon the breast of the heel and the thumbs on the back of the heel.
8. Press down with the thumbs, and at the same time, slide each along in the direction of the arrows (Fig. 142).
9. Repeat this operation on the other side of the heel.
10. Cut notches into top, bottom, and both sides of the extended edges of the cover as shown in Figure 143.
11. Give the notched cover and heel another coat of cement. When they are dry, fold them into place. Avoid making any bumps or wrinkles.
12. Attach the heel as shown in Figures 144 and 145.
13. Cut a piece of heel breasting, the covering for the front part of the heel. Cut it long enough so that you can tuck ¼ in. under the top lift and at least ¼ in. beyond the end of the heel tongue. Apply cement to the breast of the heel and to the breasting.
14. When tacky, attach to heel and trim down both sides to the shape of the heel.
15. Put on the top lifts and fasten them with metallic fasteners (Fig. 316) or brads (Fig. 234).

ATTACHING WOMEN'S HEELS

Attaching wood or plastic heels (Fig. 144) is not a difficult job. After selecting the proper size and shape of heel, mark off and prepare the area

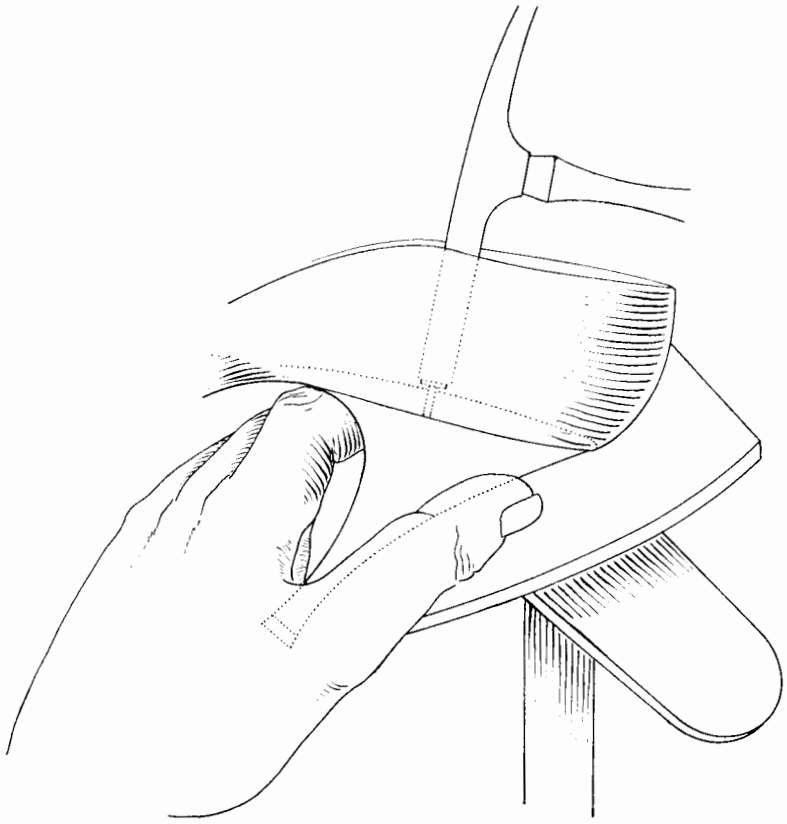


Fig. 144. Attaching wood or plastic heel.

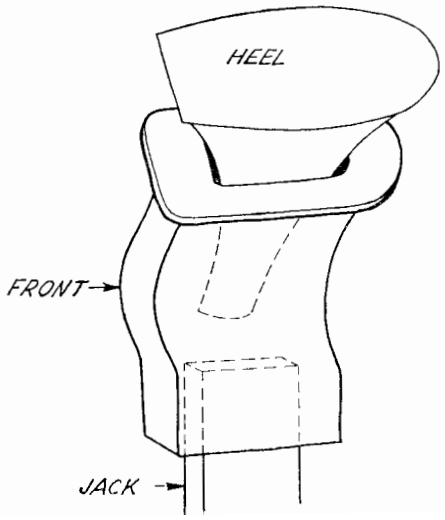


Fig. 145. Rubber-cushioned heel rest.

to be occupied by the heel by removing any obstacles that may interfere with complete contact all the way around the heel. In some cases it may be necessary to lower the center of the heel seat slightly. This can be done by skiving that part of the sole upon which the heel will rest. Remove a little at a time until a good fit is obtained. (If too much is removed a split heel may result.) *Do not* try to fit the sole by gouging out the base of the heel (Fig. 135), because the tongue of the heel (Fig. 135) may be wrecked and with it the entire heel. Remove the glaze from the base of a covered heel with a piece of sandpaper. The glaze on a plastic heel may be removed on the roughing wheel (Fig. 225). Coat the heel and sole with all-purpose cement and let it become tacky. Place the heel in position and press it down firmly to make sure that the edges have made contact all the way around.

To make doubly sure that the heel will withstand the terrific daily pounding, drive no less than three nails into the heel from the inside of the shoe. Hold the shoe so that the back of the heel rests on the edge of the last as shown in Figure 144. Place a relatively soft rubber sole between the heel and the last to cushion the hammer blows and protect the heel. With an awl make a starting hole for the nails that are to be driven into wood heels (Fig. 215). Use wood heel attaching nails (Fig. 232) and toe them in toward the center of the heel. Start the nails far enough from the center of the heel so that they will not strike the metal shank. Because it is more difficult to drive nails into plastic heels, you can make your starting holes with a ratchet drill using a No. 53 bit. Use a plastic heel attaching nail (Fig. 233). Put in a new heel pad (Fig. 23).

ALTERNATE METHOD

An alternate method of attaching women's heels is becoming very popular. It employs a rubber-cushioned heel rest that will hold the heel firmly in position during the nailing operation. It is a very simple piece of equipment that will fit most jacks (Fig. 145). In using this method, follow the same general procedure as in the previous method.

REPAIRING WOOD HEELS

Although it is a simple process to replace top lifts, it often is necessary to restore, rather than replace, a badly worn block or cover. Where a heel has been worn down to such an extent that it is necessary to cut away part of the block, it is better to replace the heel completely. Where it is not possible or advisable, however, care should be exercised to keep the original pitch of the heel (Fig. 128). The cover should not only be

carefully smoothed and cemented in place, but enough should be turned under the heel to make a good and permanent job.

When a top lift is applied, it is good to use a Celluloid under lift. Where this cannot be obtained, the underside of the new top lift must be carefully cleaned of all flesh and loose fibers. Neither too many nor too heavy brads should be used in attaching the lift.

All loose breasting should be cemented and the heel should be trimmed along its original lines.

A repairman always should do a complete job by checking a shoe and mending where necessary. For instance, a shoe may need gluing at A, Figure 146. Such repairs should be made without first consulting the customer. The cover and breasting should be checked. See pp. 135–146.

HEEL AND SHANK SUPPORTS

A severe breakdown is an indication that the shoe is being subjected to more rigorous service than that for which it was constructed. Explain to your customer that in order to receive the comfort and service which they have a right to expect, the shank will need additional support. This can adequately be supplied by inserting shank and heel supports (Fig. 147).

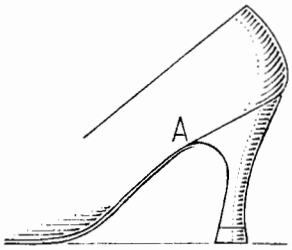


Fig. 146. Heel joined with sole at A.

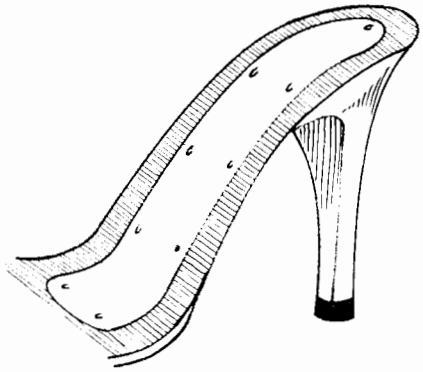


Fig. 147. Heel and shank supports.

REVIEW QUESTIONS

Types of Heels

1. What is meant by prebuilt heels?
2. How many types of heels are there? What are they called?
3. What material is used for the top lift? What is it called?
4. What is used for the rest of the heel?
5. How are heels attached to a shoe?

Leather Heels

6. When repairing leather heels, what material should be used?
7. Why is the use of wedges or skivings not considered good shoe repairing?
8. What makes a good solid-built heel?
9. Why should cement be applied between lifts?
10. What should be done about old nails in a heel?

Rubber Heels

11. What should be done to rubber heels that are too large?
12. When half rubber heels are to be attached, how much of the old heel should be removed?
13. What should be done about the wax glaze on rubber heels?
14. How are the rubber and leather heels combined?
15. Before attaching a half rubber heel, how should the old leather heel be removed?
16. How should a full rubber heel fit?
17. How should nails be driven into rubber heels?

Spring Heels

18. What type of shoes have spring heels?
19. How are spring heels formed?
20. What is the breast of the heel?
21. How is the taper or bevel of the heel held firmly to the shoe?
22. How far should roughing be done on the sole?

Orthopedic Heels

23. What is the purpose of an orthopedic heel?
24. How should such heels set on a shoe?
25. Who wears such heels?

Combination Heel

26. What is another name for a combination heel?
27. Why should this heel be cemented before nailing?
28. How should this heel be set on a shoe?
29. When trimming the heel, why should as much rubber as possible be retained?

Wooden Heels

30. Why are wooden heels used in women's modern footwear?
31. Why does a manufacturer oftentimes substitute a wrong type of heel?
32. How can the correct height or wedge of a heel be determined?
33. What will the weight of the body do to a shoe on which the heel does not set level?
34. If the arch brace is broken, what happens to the shoe?

Pinching and Bulging

35. What is a common defect in low shoes?

36. What will be the result if a heavy heel pad is inserted?
37. What will stretching or pounding do to a shoe?
38. What is another defect in low shoes?
39. How can pinching and bulging be corrected?

Gapping at the Heel

40. What defect often develops after a shoe has been worn?
41. How can this difficulty be corrected?
42. What will the insertion of a heavier lining do?
43. If the heel is the source of the trouble, how can a correction be made?
44. What should not be done to the heel?

Covering Wood Heels

45. What makes covering wood heels such a stable and profitable project?
46. In which direction should the leather be cut?
47. What is the important thing to avoid in covering heels?
48. Why must the breast side of the cover be carefully notched?

Attaching Women's Heels

49. How is the heel fitted to the sole?
50. Why should the heel not be gouged out to fit the sole?
51. What may happen to the heel if too much material is removed from the sole?
52. What kind of nails are used to attach the heel?
53. How are the starting holes made for the nails on a wooden heel, on a plastic heel?
54. What alternate method is available for supporting the heel during nailing?

Repairing Wooden Heels

55. If a heel has been worn down too much, what should be done?
56. If a heel is not replaced, what must be kept in mind?

Heel and Shank Supports

57. How can one tell when a shoe is subjected to a more rigorous service than that for which it was built?
58. How can you guard against the recurrence of a breakdown?
59. What should be done to the heel covering?
60. What should be done to an under lift before the top lift is applied?
61. When breasting is loose, what should be done to it?

GENERAL QUESTIONS

1. Why are heels important?
2. List the various kinds of heels. Which is most common? Least common? Under what condition is each used?
3. What are common difficulties in putting on heels?

CHAPTER 7

Miscellaneous Repairs

HEEL LININGS

Worn heel linings can be replaced by the following procedure:

1. Trim away all ragged edges from the old lining.
2. Cement the remaining lining to the shoe, by applying rubber cement in and around the hole.
3. Cut the new lining long enough to cover all spots which show wear.
4. Permit the new lining to extend about ¼ in. under the foot and about ⅛ in. above the top of the oxford or slipper, for trimming.
5. Skive both ends and the bottom of the new lining.
6. Notch (serrate) the bottom of the lining around the back of the heel, which will make a smooth fold under the foot (Fig. 150).
7. Cement the inside of the shoe and the lining.
8. When the cement is dry, fold the lining end to end, with the cement side out.
9. Place the fold in position in the back of the shoe (Fig. 151) allowing ⅛ in. to extend above the top.
10. Press both sides into position along the top, keeping in mind that there is a ⅛-in. surplus.

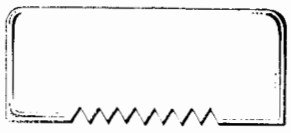


Fig. 150. Heel lining notched at the bottom.

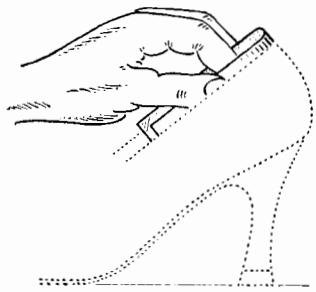


Fig. 151. Placing lining in the back of the shoe.

11. Press the balance of the lining in position. Begin at the back, and press downward and forward. This will prevent it from wrinkling and from adhering too quickly.
12. Stitch around the top and be sure to follow the old seam.
13. Trim the surplus leather from the top. Do this in one complete operation, avoiding stops and starts, as this would produce a ragged edge.
14. Dye or stain the raw edge and rub it smooth. Insert the heel pad.

CEMENT PATCHING

When there is a break in the vamp it can be repaired by cementing a patch to it and then finishing it so that it is hardly noticeable. It is done as follows:

1. Wrap a piece of emery cloth around a small, flat stick that will fit into the break.
2. Work it under the uppers, immediately around the break, to clean the under surface thoroughly.
3. Apply a coat of all-purpose cement to the cleaned surface.
4. Should the lining also be broken, give it a coat of cement.
5. Permit the cement to dry, but see that the lining does not stick to the uppers.
6. Cut a piece of good but not too light patching leather, large enough to extend at least ⅜ in. beyond each side and end of the break.
7. Carefully skive, or bevel, the edges all around, and rough up the smooth surface.

   NOTE: Patches that are to be inserted between the lining and uppers should always be skived on the hair side and inserted with the hair side up. If any of the skiving is visible after inserting, the patch is not centered and will not hold.
8. Apply cement on both sides of the patch if the lining is also broken.
9. When the cement is dry, insert the patch between the uppers and the lining.
10. Should the hole be too small to receive the patch, roll the patch up tightly and insert it into the break.
11. Unroll the patch and position it with the point of a sewing awl.
12. Place a stretcher into the shoe.
13. Apply a light coat of cement to the inserted patch and the uppers.
14. Tighten the stretcher enough to fill out the shoe.
15. Press the two broken edges of the vamp tightly together.
16. Pin them down with a few small lasting tacks to prevent slipping while drying.

17. When the lining also is broken, apply cement solvent to the lining with a small cotton dauber over and around the break.
18. Press the lining tightly to the patch and permit it to dry. This will make the cement previously applied to the lining stick to it.
19. When the cement is dry, only a hairline should indicate the location of the break, and this can be eliminated by applying repair crayon or heel ball, then polishing over it.

PATCHING NEAR SEAM

1. Should the break occur near a seam, rip the part that is still attached.
2. Follow the preceding patching direction.
3. Stitch the ripped section back into place.
4. Finish as directed above.

PATCHING NEAR SOLE

1. Insert a knife, and rip the inseam between the welt and the uppers a little longer than the length of the break.
2. Cut a patch the length of the ripped section and wide enough to extend from ⅜ in. beyond the break to ¾ in. beyond the edge of the upper.
3. Skive, or taper, the rounded side of the patch (Fig. 152).
4. Insert the side of the patch so that it is ⅜ in. beyond the break, and cement it with all-purpose cement. The straight unskived edge should then extend ¾ in. along the edge where the upper and insole meet.
5. When the cement is tacky, cement both sides of the extension well.
6. Tuck the extension between the welt and the inner sole. Check to see that enough cement is left on the patch, and apply more if necessary, because some of it may be removed while tucking in the patch.

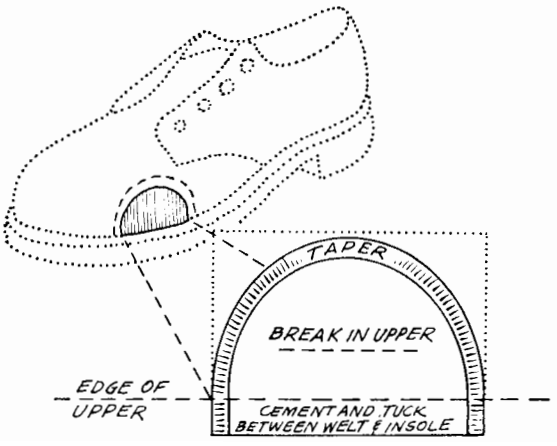


Fig. 152. Patching near the sole.

7. Place the shoe in a press, and let it dry.
8. If no press is on hand, pin the sole down with a few nails which can be removed later when the cement has dried.

PATCHING GREASY VAMPS

1. If the shoes are more or less greasy, some of the grease can be removed from the area around the break with cleaning solvent.
2. When this part has dried, follow the same procedure as directed under "Cement Patching."
3. Reinforce the cement by cross-stitching, as shown in Figure 153. A cross-stitching attachment is available for the sewing machine, eliminating the constant raising of the presser foot (Fig. 308). Once this device is attached it need not be removed when doing regular sewing.
4. Tie down these stitches, called an *overseam*, by stitching down the center of the break as in Figure 154.
5. Tie down the edges by stitching close to the edge along each side of the break as in Figure 155.

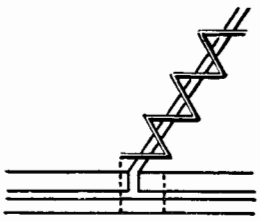


Fig. 153. Cement reinforced by cross-stitching.

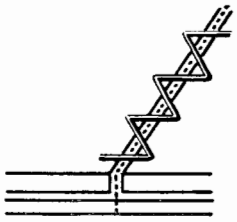


Fig. 154. Stitch down center.

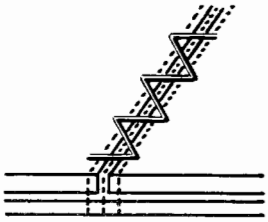


Fig. 155. Stitch along each side of shoe.

PATCHING NEAR SOLE ON GREASY OR HEAVY SHOES

1. After degreasing follow the same procedure as for the same type of job under "Cement Patching."
2. Reinforce the cement by running one or two rows of stitches along the broken edge of the uppers.
3. Tuck in the patch as previously directed and tack it permanently in place. Be sure that the tacks pass through the outer sole, the patch, and the inner sole, drawing them firmly together.

SEWING RIPS

When seams rip it is usually due to a strain at that certain point. Therefore, when repaired, this seam must be stronger than it originally was.

To do a good repair job, first, all dirt should be cleaned from the surfaces to be joined. Rubber cement then should be applied to both pieces, and after the cement has dried, the pieces should be pressed together.

To be sure that a seam will not ravel or open up at the point where stitching is started and stopped, about half a dozen stitches should be taken in the opposite direction away from the rip. The direction of sewing now should be reversed, sewing about five or six stitches beyond the outer end of the rip. The sewing then again should be reversed and several stitches made over last stitches beyond the rip.

Oftentimes a repairman is asked to sew a rip on shoes which have been worn too long before mending, or have been very wet so that in drying a part of the rip has shrunk away. If the leather around such a tear is hard to pull back in place, it should not merely be stitched down as it is. Such a shoe should be placed on a last or stretcher, the leather should be wetted and stretched into its original position. It can be held in place with a few lasting tacks driven in just enough to hold it. After the leather has dried, it should be cleaned, cemented, and stitched with overlapping ends as directed previously.

Frequently the seam which unites the two sections of the quarters in the back of the shoe rips, thus straining the seam which attaches the backstay causing it to rip. To repair this, the backstay should be ripped all the way around, and the seam uniting the quarters should be stitched together by hand, with an overseam as shown in Figure 153. The backstay then should be cemented and stitched down.

NOTE: If shoes are to be resoled, it is much easier to sew all rips while the sole is off.

SEWING RIPS IN TURNED SOLES

1. Get a sewing awl and bristle-end thread, as shown in Figures 243 to 245 inclusive.
2. Begin at one end of the rip and punch a hole through the sole where the sole and the uppers meet.
3. Pass the thread through the hole, and pull it through to the center of the thread (Fig. 156).
4. Punch a hole into the uppers, next to the sole and even with the protruding thread.
5. In the same operation, the awl should come out ¼ in. from where it entered, also next to the sole (Fig. 157).
6. Pass the thread on the upper side through the first hole, and bring it out through the second hole (Fig. 158).

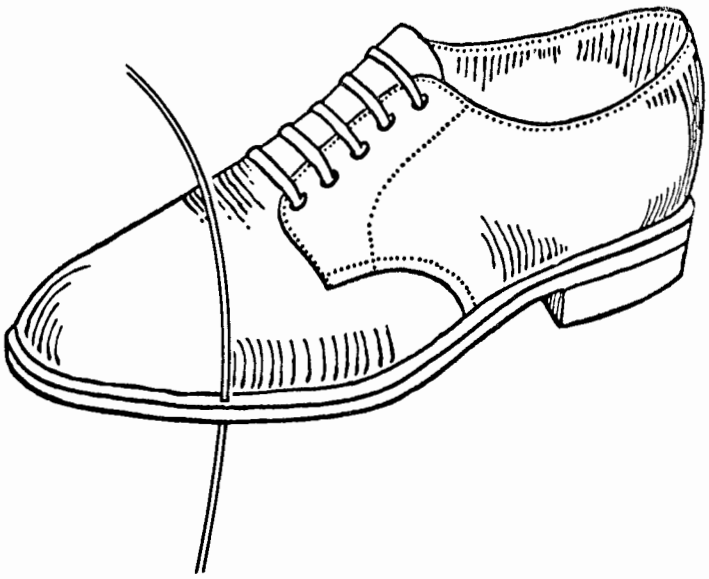


Fig. 156. Thread passed through hole and pulled through to center of thread.

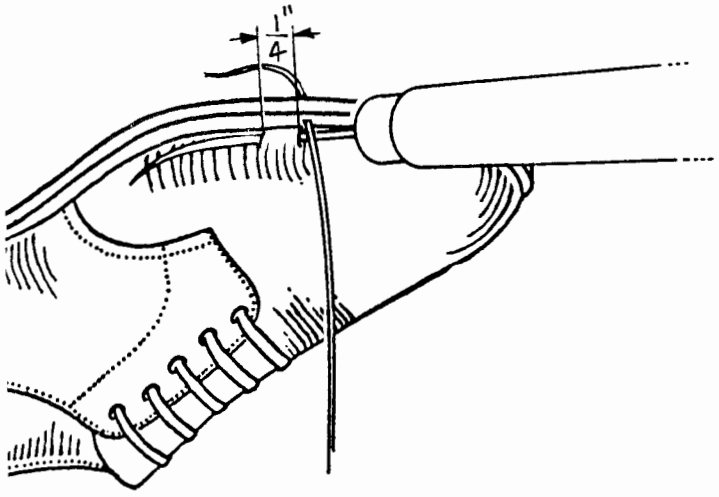


Fig. 157. Awl poked into last hole where thread emerged.

7. Punch a hole through the sole even with the thread which emerges from the uppers.
8. Pass the end of the thread on the sole side through this hole, and at the same time pass the other end of the thread through from the upper

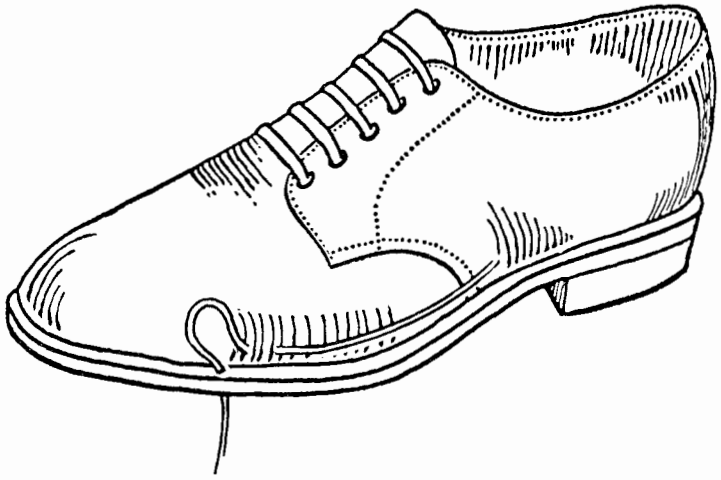


Fig. 158. Thread passed on upper side through first hole and brought out through second hole.

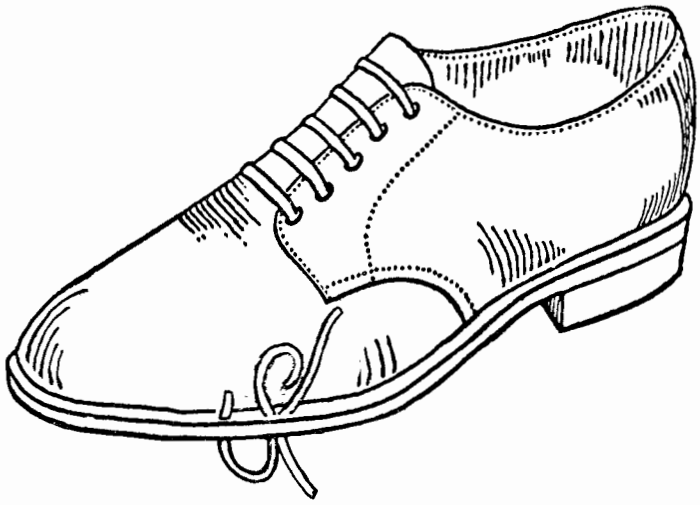


Fig. 159. Thread on sole side passed through hole at the same time thread is passed through upper side.

side. Then pull the thread tight (Figs. 158 and 159). This is the first stitch, and all that should be visible of this stitch is the thread on the sole.

9. Poke the awl into the last hole from which the thread appeared, and let it come out of another hole as shown in Figure 157.
10. Punch another hole through the sole, and repeat as in step 8.

11. Repeat these operations until the rip has been mended.
12. When completed, all that should be visible of the seam are the threads on the bottom of the shoe because the other side of the seam is on the inside of the shoe.

STRETCHING IN WIDTH

It is impossible to stretch the rigid type of materials used in shoe bottoms; and, therefore, all stretching is accomplished at the expense of the more pliable materials used in uppers.

Shoe stretching must be done very cautiously especially when the shoe is made of lightweight materials and fabrics which may break very easily. Although there is less danger of this in heavier shoes, still the inseams and other stitches may be broken.

To stretch shoes in width, wet them sufficiently from the inside to penetrate the lining before inserting the stretcher (Fig. 160). Then tighten the stretcher and at short intervals give it another turn. This will cause the leather to expand gradually.

Occasionally a situation arises where the customer purchased the wrong shaped shoe or was in an accident causing a condition which is not serious enough to require medical attention nevertheless too painful to have any part of the shoe press upon it. In many such cases raising the toe of the shoe even a little will give relief. A special toe-raising stretcher is used for this purpose (Fig. 161). Toe boxes in most instances will give readily since they are usually made of pliable material. Raising the toe of only one shoe will many times make the pair look mismated. The toe on the other shoe will have to be raised if the difference is too pronounced.

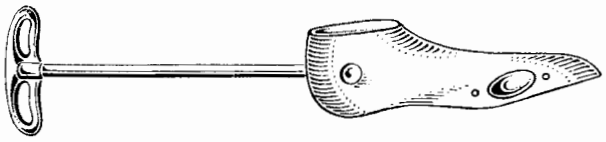


Fig. 160. Shoe stretcher.

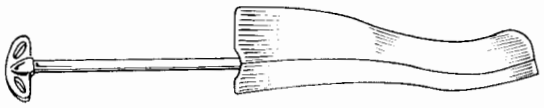


Fig. 161. Toe raising stretcher.

STRETCHING IN LENGTH

Stretching a shoe in length can rarely be done satisfactorily. Usually, if the shoe is not exceedingly short, some relief can be obtained by inserting a heavy heel pad or heel cushion. This will raise the heel of the foot

and tend to draw the foot back. However, this may make the laces come too close together. If so, a tongue pad can be stitched to the inside of the tongue, thereby spreading the laces once again.

REMOVING SQUEAK

Squeak, the result of friction, is not confined to shoes that have been repaired, but is found on occasion in high-priced new shoes. In double-soled shoes, friction is most likely to develop between the midsole and the outer sole. In single-sole shoes, the offending area is often the shank. When a squeak develops in either of these places, it is a simple matter to remove it. Merely rip the sole for about an inch, at A (Fig. 162). Insert

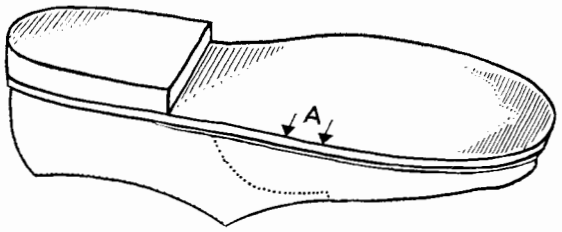


Fig. 162. Location for inserting soapstone.

a screwdriver between the soles, in the direction of the squeak. Give the screwdriver a quarter turn to further separate the two chafing pieces of leather. Before removing the screwdriver, drop about one half teaspoonful of soapstone through the hole on each side of the screwdriver. This can easily be done with the tip of a square point knife. Now tap the bottom of the sole a few times with the butt end of the knife to insure a good distribution of the powder. Remove the screwdriver, sew, tack, or cement the rip, and refinish the sole so as to remove all trace of the opening. If the squeak is in the shank, proceed in the same manner, except that when inserting the screwdriver, point it slightly upwards so as not to catch and detach the shank.

NOTE: Do not attempt to remove the squeak by soaking the soles in oil or water, because after drying the squeak will often be intensified. Also driving a lot of nails into the sole is ineffective, because generally the chafing is confined to a very small area, often not more than a fraction of an inch.

Sometimes shoes will squeak in least suspected places, and at times be so elusive that mere hand manipulation will not reveal the location. When a squeak develops in inaccessible places, a small rubber syringe (Fig. 163), partially filled with soapstone, will enable you to blow the soapstone

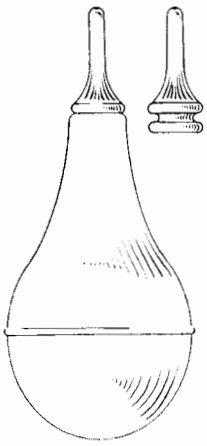


Fig. 163. Syringe.

into hard-to-get-places, without tearing into the shoe. The syringe can be purchased at a drugstore.

HEEL PLATES

Many industries have come into existence which have soon been followed by manufacturers of accessories. Retailing such accessories often has developed into a profitable business, otherwise there would not be so many accessory stores.

The shoe business is no exception to this rule. A great many shoe accessories can be profitably handled, but many repairmen do not bother with them. Some of these items are sold over the counter, while others, like heel plates, must be attached by the repairman.

Heel plates are divided into two groups, the insert type and the surface type, each of which is attached differently.

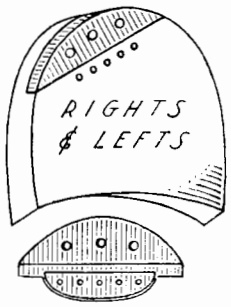


Fig. 164. Quarter tips.

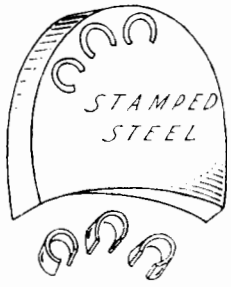


Fig. 165. Circlettes.

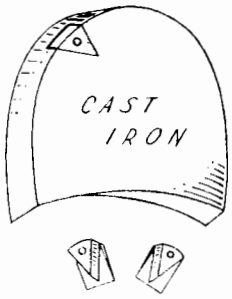


Fig. 166. V plates.

Fig. 167. Economy plates.

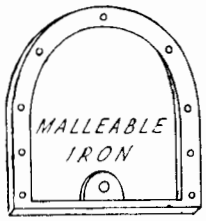


Fig. 168. Miners' rim plates.

Fig. 169. Horseshoe plates.

INSERT TYPE

The different kinds of insert plates are known as follows: quarter tips, circlettes, V plates, economy plates, miners' rim plates, and horseshoe plates (Figs. 164–169).

Before attaching insert plates to shoes which have been considerably worn down at the heels, build up the heel to the stage where a top lift would normally be applied. The heel should be built up either as shown in Figure 116 or complete new lifts should be used. Wedges or skivings should never be inserted.

The heel should now be leveled and fitted with the correct size plate which should be fastened permanently.

A previously tempered top lift then should be selected and placed on the heel. It should be lightly tapped with a hammer which will imprint the outline of the plate on the bottom of the lift. The imprinted section then should be cut out accurately, after which this top lift should be nailed in position.

On new shoes, after removing the top lift, dampen the remaining lifts and then follow the above procedure.

SURFACE TYPE

To attach a surface plate, place it in position on the heel, marking the location of the holes or prongs. Remove the plate and punch the marked

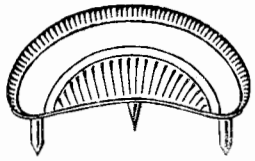


Fig. 170. Malleable-iron surface plate.

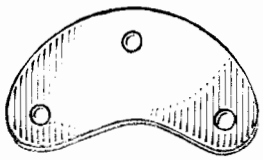


Fig. 171. Steel surface plate.

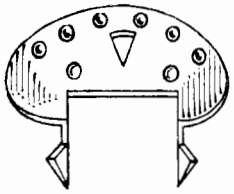


Fig. 172. Steel surface plate.

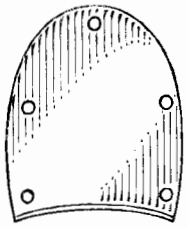


Fig. 173. Steel surface plate.

holes in the heel. Dampen the heel, permitting the water to seep into the holes. Then attach the plate. This method insures against losing the plate and cracking the heel. Various kinds of surface plates are shown in Figures 170–173.

REVIEW QUESTIONS

Heel Linings

1. What should be done with the ragged edges of the old lining?
2. How long should the new lining be cut?
3. What should be done to the ends and the bottom of the new lining?
4. How is the lining placed in the shoe?
5. In what direction should the lining be pressed in position?
6. What should be done to the top of the lining?

Cement Patching

7. What is the first step in repairing a break in a vamp?
8. If the lining is broken, what should be done?
9. Why should patches be skived on the hair side?
10. Which side of the patch should be up when it is in place?
11. How should a patch be prepared before inserting it?
12. What should be done to the broken edges of a vamp?
13. How can the location of the break be made invisible?

Patching Near Seam

14. If the break is near a seam, what is the first thing to do?
15. How is this patch finished?

Patching Near Sole

16. How far should the inseam be ripped?
17. How large should the patch be?
18. How should the patch be shaped?
19. Why should the patch be rounded on one side?

Patching Greasy Vamps

20. How can grease be removed from shoes?
21. How can a cemented patch be reinforced?

Patching Near Sole on Greasy Shoes

22. What is the first step when getting ready to patch near the sole on a greasy shoe?
23. What is done next after tucking in the patch?

Sewing Rips

24. What causes seams to rip?
25. After the ripped parts have been cleaned, what should be done next?
26. How can a seam be sewed to prevent raveling?
27. How can a rip be prepared when the ends do not meet?
28. What should be done if the seam under the backstay rips?
29. What will happen if the backstay is stitched without first stitching the seam underneath?
30. Why should all rips be sewn before attaching new soles?

Sewing Rips in Turned Soles

31. What tools are used to sew a turned sole?
32. How is the thread prepared to sew this sole?
33. Where should this stitch be visible?

Stretching in Width

34. Why is shoe stretching a risky operation?
35. What should be done with shoes before stretching?
36. What will gradual tightening of the stretcher do to the leather?
37. Will stretching also widen the inner and outer sole?
38. Where does all the give in stretching take place?
39. How can additional width be gained in extreme cases?

Stretching in Length

40. How can a shoe sometimes be made wearable if it is a little too short?
41. How will this correction affect the foot while in the shoe?
42. How will the lacing be affected? How can this be remedied?

Toe Raising Stretcher

43. Why do toe boxes occasionally need raising?
44. What are some of the causes?
45. Is this to correct or alleviate a condition?
46. Of what materials are toe boxes made?
47. What action must be taken to prevent a mismated appearance?

Removing Squeak

48. What are the causes of squeak?
49. Are squeaks limited to any particular area?

50. Is holding the shoe up to the ear and flexing it an infallible method of locating the squeak?
51. Where is the shoe most likely to squeak?
52. When resoling, how are shoes prevented from squeaking?
53. Does soaking in oil or water permanently remove the squeak?
54. Is driving the sole full of nails sufficient to remove all friction?
55. What method can be employed to remove squeak in inaccessible places?
56. What material is used for removing squeak?

Heel Plates

57. How many types of heel plates are there?
58. What are the names of the different types of insert plates?
59. How should a heel be prepared for an insert plate?
60. What should be done to the top lift before it is fastened?
61. What is the first step when surface plates are to be attached?
62. What should be done to the heel to prevent the plate from loosening?

GENERAL QUESTIONS

1. List the steps in replacing heel linings.
2. List the steps in cement patching.
3. Which kind of repair job discussed in this chapter is likely to be required most often? Why?
4. Which type of shoe repair discussed in this chapter is most difficult? Why?

CHAPTER 8

Shoe Alterations

FOOT IRREGULARITIES

As with the other medical sciences, chiropody, or the curing of ailments of the foot, has made great advances in recent years. There has always been a substantial need for correcting or at least alleviating the discomfort of foot troubles. Some of these ailments are present at birth; others are the result of disease, accident, vanity, or abuse.

In the not too distant past, the responsibility for a great deal of the care of foot troubles fell upon the shoe repairman. In those days, a shoemaker apprentice learned the art of custom shoemaking and so was well trained in fitting shoes to any kind of foot – even the seriously crippled. He learned to measure a foot by having the customer stand on a piece of paper and then tracing the outline of the foot (Fig. 176). He then took critical measurement at the ball, waist, instep, heel, and ankle (Fig. 177). From the measurements and the outline, he was usually able to make a comfortable shoe. At times he made a plaster cast of the foot. He used the measurements in building up the last with leather (Fig. 178). In this way many cases of foot troubles not of a permanent nature were relieved or cured.

Today chiropody has eliminated much of the need for guesswork in diagnosis and treatment of foot ailments. The role of the shoe repairman as adviser has, at the same time, shrunk considerably. His part in foot health is similar to that of the pharmacist. The shoe repairman fills the prescriptions of a licensed chiropodist, refills when there is no change in

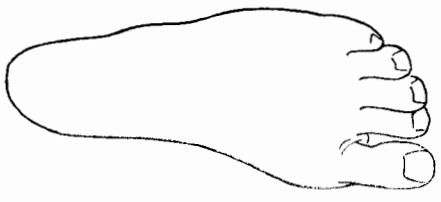


Fig. 176. Foot outline.

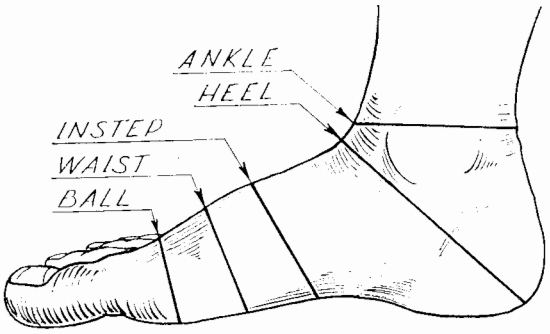


Fig. 177. Foot measurements.

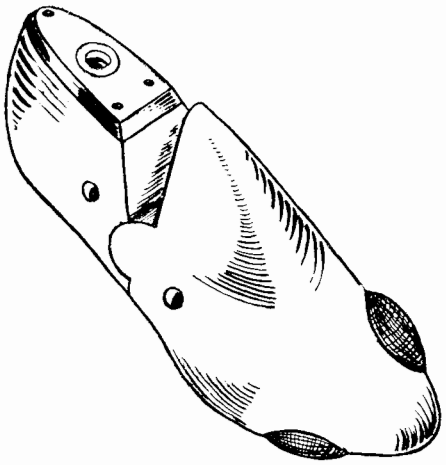


Fig. 178. Last built up with leather.

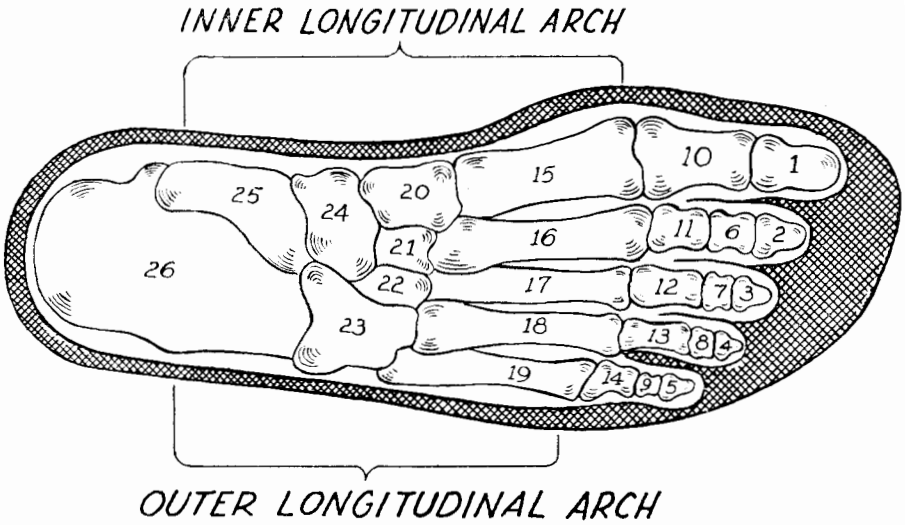
the condition of the foot, and gives advice sometimes on very minor problems.

Because of the tremendous need for special footwear, manufacturers have entered the custom-shoe building field. Some have taken up the manufacture of combination last shoes. However, no one is eliminated in the field of shoe refitting, for nature has endowed all of us with feet that are not mates. This makes it exceedingly difficult, and in many instances impossible for regular stock shoes to deliver a maximum of wear and comfort, or to maintain a neat appearance for a long time without having alterations made in some form or other.

Altering regular stock shoes so that they will give the same long-lasting appearance and comfort as custom-made shoes, or combination last shoes, opens a tremendous field for all shoe repairmen. To all appearances feet are alike, yet there is a vast difference. There are long and short, high

and low, weak and strong arches. The individual's weight, health, type of work, and whether the ailment is of a temporary or permanent nature is of vast importance in correctional work. This variation is often so extensive that it is patently impossible to construct stock shoes to fit all of these feet. In spite of the fact that length and width have been standardized, by the manufacturers, and many methods have been devised for the measuring of feet, the feel and comfort of the shoe is the deciding factor in a good fit. A well-fitted shoe *should permit the foot to relax completely at each step.*

Clothing sizes also are standardized, yet very few suits are sold which do not require some alterations. In fact, this need is so extensive that clothing stores require the services of one or more bushelmen. Unlike clothing, where misfit is evident at the time of purchase, shoe irregularities are in many instances not evident until the shoes have been worn for some time.



TOES. 1 to 14. Phalanges.

INNER LONGITUDINAL ARCH
26. Oscalsis — Heel bone
25. Astragalus — Angle bone
24. Scaphoid
20. Inner Cuneiform
15. First Metatarsal

TRANSVERSE ARCH
20. Inner Cuneiform
21. Middle Cuneiform
22. Outer Cuneiform
23. Cuboid

OUTER LONGITUDINAL ARCH
26. Oscalsis — Heel bone
23. Cuboid
19. Fifth Metatarsal

ANTERIOR METATARSAL ARCH
15. First Metatarsal bone
16. Second Metatarsal bone
17. Third Metatarsal bane
18. Fourth Metatarsal bone
19. Fifth Metatarsal bone

Fig. 179. Bones of the foot.

The fitting of shoes offers the repairman unlimited opportunities. These services are extremely valuable to the customer. Just as with clothing, the public must be convinced of the importance of well-fitting comfortable footwear.

Anyone doing correctional work, altering, or making new shoes to fit crippled or abnormal feet, with or without a prescription, must have some knowledge of the construction and workings of the feet. He must also bear in mind that no matter how extensive his knowledge, he cannot write the prescription.

The feet are a very intricate mechanism, for in them are found 52 of the 206 bones of the body, a great many muscles and tendons, scores of ligaments in addition to many tissues, nerves, and so on. The bones are divided into three identification groups: the toe bones (Phalanges) numbered from one to fourteen in Figure 179, the metatarsal bones numbered from fifteen to nineteen, and the tarsal group numbered twenty to twenty-six. Each functions in its own way and serves a definite purpose. Any misalignment or injury to any of them, will not only involve others, but oftentimes makes it hard to detect the offender.

A glance at Figure 180 will show an arch formed by the latter two groups. This arch is subdivided in order to define and localize its functions. The innerside, known as the inner longitudinal arch, is much higher and longer, extending from the heads of the metatarsal bones at the anterior end, to the oscalsis (heel bone) at the posterior end. Its counterpart the outer longitudinal arch is considerably lower and shorter, extending from the head of the fifth metatarsal bone, at the anterior end, to the lowest point of the heel bone at the posterior end.

Transversely the posterior end (transverse arch) is comprised of the cuboid and the three cuneiform bones. The anterior end (metatarsal arch), comprises the five metatarsal bones and extends across and to the rear of the ball of the foot.

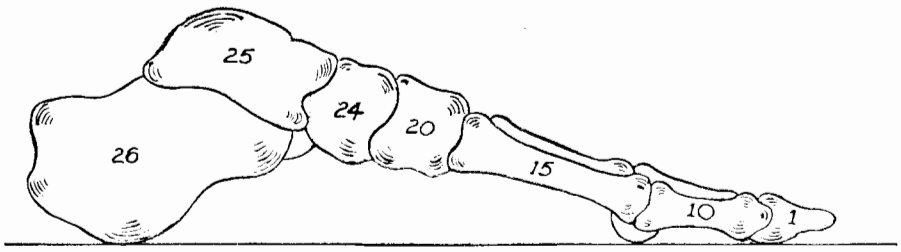


Fig. 180. Bones of the arch.

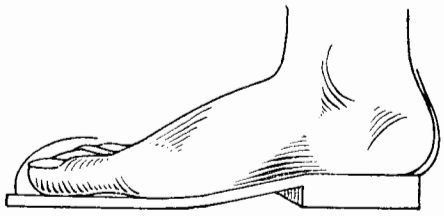


Fig. 181. Shoe too short.

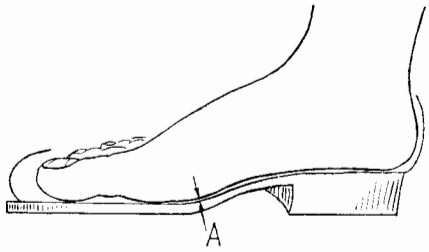


Fig. 182. Correct fit of shoe.

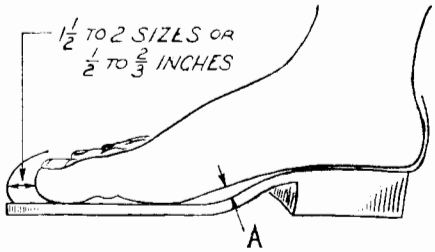


Fig. 183. Improper fit at ball of foot.

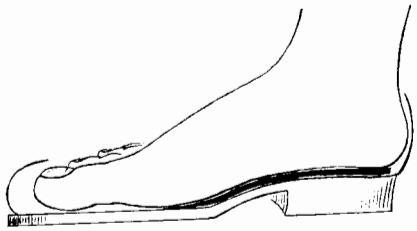


Fig. 184. Using a half inner sole to correct fit.

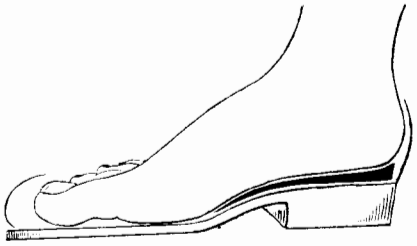


Fig. 185. Raising the heel to gain toe room.

Every pair of shoes brought in for repairs has a story to tell. An observant shoe repairman will readily notice any irregularity and make correctional suggestions. Some of these ailments may be actually or potentially serious and require reference to a chiropodist. The vast majority however are of a minor nature, or are in the preventive stage.

One of the main difficulties encountered are those caused by shoes that are too short (Fig. 181). Shoes are built, so that a normal foot, fitted on a heel to toe measurement, should also fit at the ball of the foot as in A, Figure 182.

Feet with long arches, which have ample lengthening room of 1½ to 2 sizes (½ to ⅔ in.) at the toe, may in many instances fit improperly at the ball of the foot A (Fig. 183) and must therefore be considered too short.

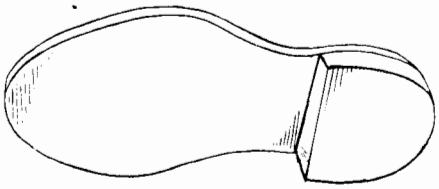


Fig. 186. Special heel construction.

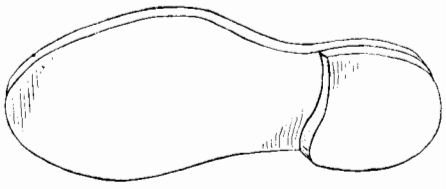


Fig. 187. A second kind of heel construction.

This condition can be corrected by taking up the void with a half innersole (Fig. 184). Be sure this is properly tapered at the ball of the foot. Where the shoe is too short at the toe (Fig. 181), ample length may be acquired by raising the foot, and thus bringing it farther back in the shoe as illustrated in Figure 185.

Weak ankles are often the result of or a contributing factor in most foot disorders. Though this condition may be only temporary due to prolonged illness, if not corrected, it will lead to more serious foot disorders.

By circumscribing the disorder, more serious complications can be avoided. This can be accomplished by altering the construction of the heel (Figs. 186 and 187) in order to support the extra burden placed upon the transverse arch, which has to support the sagging side of the ankle bone. The extent of correction should be determined by a chiropodist.

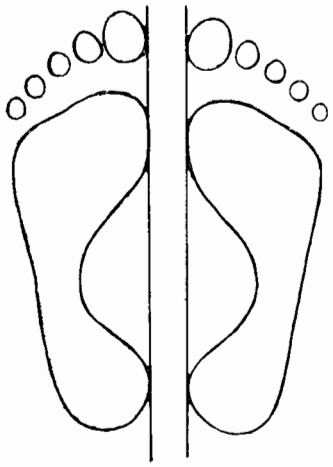


Fig. 188. Correct walking posture of feet.

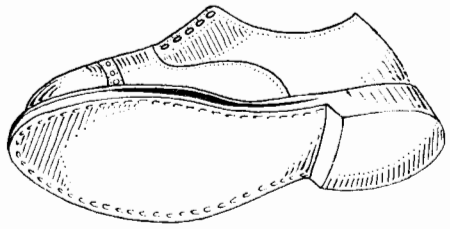


Fig. 189. Adding a wedge to the arch.

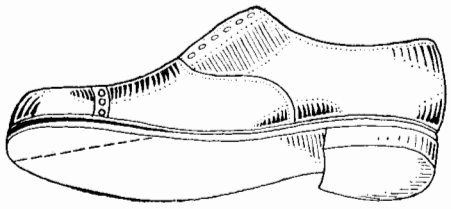


Fig. 190. Adding a wedge to the toe area.

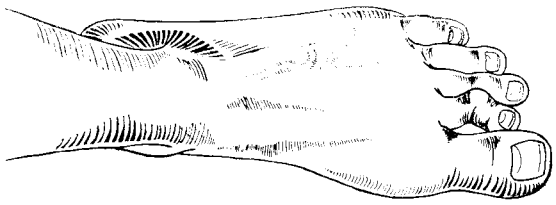


Fig. 191. Hammer toe.

WEDGES OR DUTCHMEN

Excessive wear on one side or the other of the sole may indicate that the shoes are too narrow, or that the walking posture is incorrect (Fig. 188). More often, however, it is due to some foot disorder which can be corrected. Referring the customer to a chiropodist may save him more serious trouble later. In minor cases, wedges, or Dutchmen, may be used to compensate for a weakness or imperfect posture.

When you use wedges, be sure they are positioned correctly to serve the purpose for which they are intended and do not disrupt healthy foot functions (Figs. 189 and 190).

HAMMER TOE

The hammer toe (Fig. 191) is caused by wearing shoes that are too short or too pointed. This deformity can be reduced to a minimum by discovering and removing the cause in the early stages. Resulting in most instances from shoes that gratify vanity, this condition is not only neglected, but frequently aggravated, until complications requiring surgery arise. Like most other foot troubles, the case should be referred to a chiropodist. To allay the condition, place an insole with a hollowed out place for the offending toe, into the shoe, or make this indentation in the regular insole when half-soling the shoe.

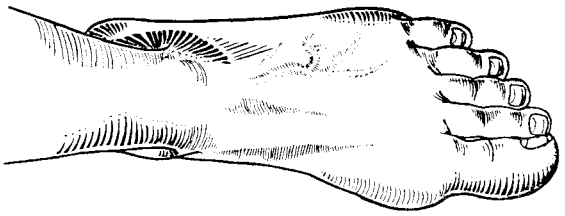


Fig. 192. Bunion.

BUNION

Another very common condition, the bunion (Fig. 192), is caused mostly by wearing footgear which is either too pointed, too short, or has a tendency to crowd the toes into an unnatural position.

This problem should be referred to a competent foot doctor because it will not correct itself. Once this condition has started, it is more likely to become worse instead of better unless remedial steps are taken. Until a chiropodist can be consulted, the condition can be alleviated by discarding the offending footwear and by wearing a pad between the first and second toes.

EXTENSIONS

At times one leg may be shorter than the other, requiring an extension to raise the short leg equal to the other. Because shortages result from a wide variety of causes, not all of which are incurable, diagnosis and measurements should be made by a chiropodist. Extensions may not always be the solution, as in congenital, or undiscovered hip dislocations. Extensions whenever possible should be made in the most inconspicuous manner, inside the shoe if possible. Where the shortage is small, it can be remedied by building up the inside of the shoe as shown in Figure 185. This with an added lift or two to the heel will often serve the purpose.

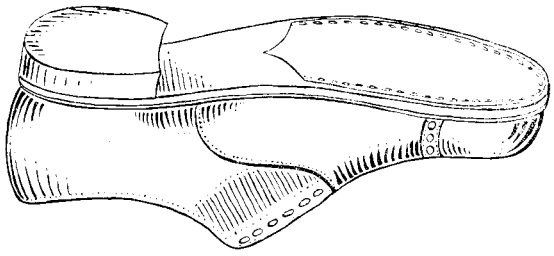


Fig. 193. A Napoleon sole.

Fig. 194. An extension made from a pair of platform shoes.

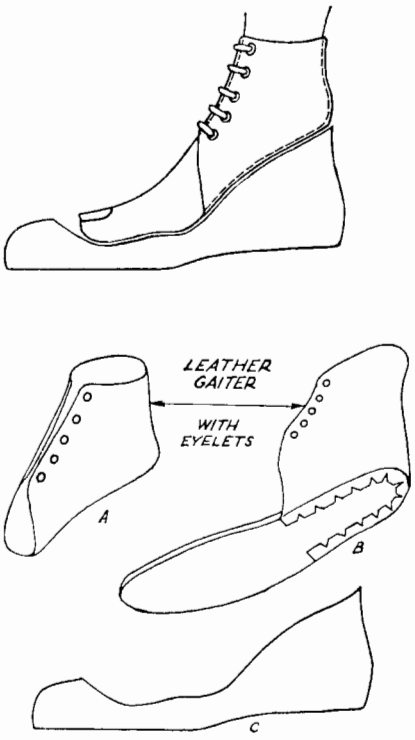


Fig. 195. An interchangeable extension.

To this can be added a Napoleon sole (Fig. 193), which can be cemented to the bottom of the shoe. The new sole should extend almost to the very edge of the old sole, and should be tapered to a feather edge.

Another method, efficient and yet very inexpensive, is to have the customer purchase a pair of platform shoes (available in various heights). Loosen and fold back the sole, on the shoe that does *not* require the

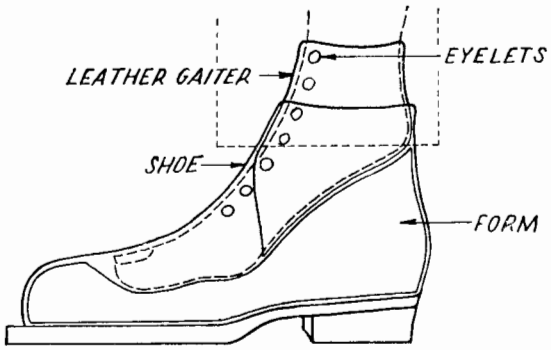


Fig. 196. Finished extension.

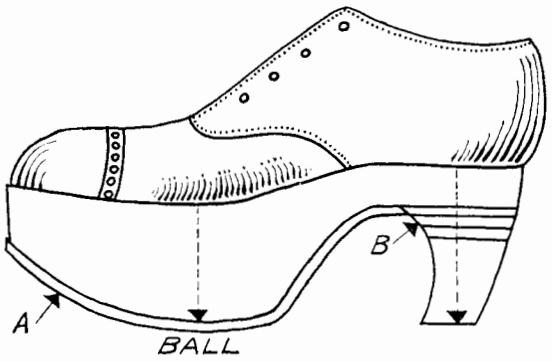


Fig. 197. A built-up sole on a man's shoe.

extension. Remove the platform, and replace the sole, or resole the shoe if the sole does not fit (Fig. 194). This is a very simple procedure and eliminates matching colors and leathers. Rather than cut down the heel, replace it with a new one. If you cannot match the covering material, the heels can be replaced with patent leather finished heels, since they go with any leather.

Larger extensions (for men) can be made by building up a footrest of cork or balsa wood to which shoe quarters made to the measurement of the customer's ankle (Fig. 177) are attached.

This type of extension (Fig. 195) can be changed from one pair of shoes to another. It will also be covered by the trousers (Fig. 196).

The built-up sole is another kind of extension (Fig. 197 and 198). This

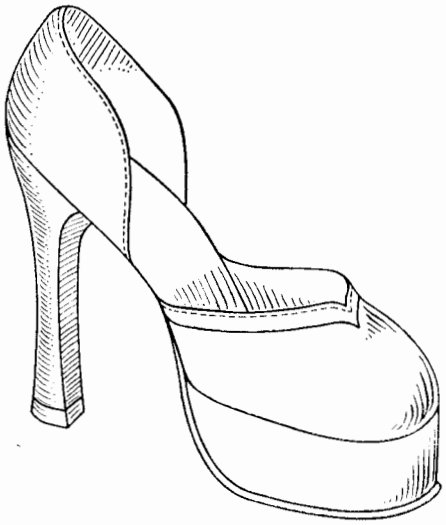


Fig. 198. A built-up sole on a woman's shoe.

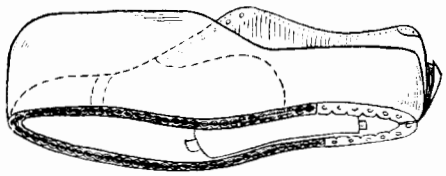


Fig. 199. Attaching an extension cover.

kind of shoe is more comfortable than that shown in Figure 196 and similar kinds in which the rear of the foot is considerably higher than the front. The extension may be made of a number of materials, cork and balsa wood being very widely used.

It is important that all completed jobs be as inconspicuous as possible. To avoid making a big bulky extension, remove the sole and welt and attach the cover as you would attach a welt (Fig. 199). This method insures a much neater and lighter job. When the extension is to be attached to a McKay shoe, the cover can be attached in the same manner as the upper. The cover should be cemented and pulled snugly over the cork, before attaching the sole. The sole can best be attached by cementing. It can also be safely attached by nailing, in which case a light leather sole should be cemented to the cork beneath the cover.

Be sure the extension is not too high in order to avoid dragging or stumbling, for extensions are a bit awkward. Since the bottoms are stiff, the shoe will not bend when completing a step. The front end should be considerably rounded (Fig. 197) or tapered as in Figure 198. In cases where high heels are required, it is important that the heel be built with a tongue to prevent cave in (*B*, Fig. 197). The heel should be centered so that it will not kick under or back.

REVIEW QUESTIONS

Foot Irregularities

1. What is chiropody?
2. What are some of the sources of foot trouble?
3. What part did the shoe repairman play in the care of foot problems?
4. How may measurements be taken for custom-made shoes?
5. What is the present role of the shoe repairman in the care of foot ailments?
6. Why cannot stock shoes fulfill the needs for specialized footwear?
7. What should be the main characteristic of a well-fitted shoe?

Foot Anatomy

8. How many bones are there in each foot?
9. What are the bones of the toes called?
10. What are the bones in the waist and instep called?
11. What is the group of heel bones called?
12. What differences do we find in arches?
13. Will shoes fitted on a heel to toe basis insure a correct fit?
14. In properly fitting a shoe, how much space should be permitted between the toes and the end of the shoe?
15. A shoe size equals what part of an inch?
16. How does a heavy heel pad create more length space at the toe?

Wedges

17. What is the most frequent cause of excessive wear on the sides of shoes?
18. Why does inserting a wedge (Dutchman) not always remedy the difficulty?
19. Why is it important that the wedges not extend to places where they are not needed?

Hammer Toe

20. What factors cause hammer toe?
21. Is this condition avoidable?
22. What may happen if hammer toe is not attended by a chiropodist?
23. How can the condition be eased?

Bunion

24. What kind of shoes should be worn to avoid a bunion?
25. Will this condition get better if left alone?
26. Should a bunion be treated by a chiropodist? Why or why not?
27. What is likely to happen if it is neglected?

Extensions

28. Who should decide whether extensions are needed?
29. Why should a chiropodist decide what type of extension will best serve the purpose?
30. What procedure is best where the shortage is slight?
31. How should a Napoleon sole be trimmed to make it inconspicuous?
32. How can an inexpensive, yet efficient extension be made?
33. Why are cork or balsa wood used in extensions?
34. Why is it best to remove the sole and heel before attaching the extension?
35. How should the cover for the cork be attached?
36. Can the outer sole be attached with nails? How?
37. What will be the result if the extension is too high?
38. Why should the front end of the extension be slightly rounded?
39. Of what service is the tongue on a high heel?

CHAPTER 9

Tools

SHOE KNIVES

In looking over the large assortment of shoe knives, it may seem that so many knives are not necessary. Many shoe repairmen have this idea, and consequently try to get along with only two or three knives. No matter how expert a man is at his work, he must admit that with the proper tools a job could have been done more accurately and with less time and effort. Many times a job which may seem difficult to the repairman could have been greatly simplified if he had the right tools for that particular work.

An important thing to remember is that knives must be kept sharp, and to do so they should not be thrown among other tools. A separate place should be arranged for them on the workbench, and they should be treated with as much care as a razor.

A *hawkbill* is purely a ripping knife and is used principally for ripping old soles from shoes (Fig. 202). It comes in the following sizes:

SIZE	LENGTH OF BLADE IN INCHES
2	3⅛
3	3½

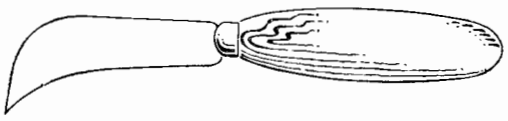
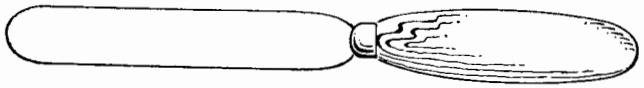


Fig. 202. Hawkbill knife.

The *round-point heavy skiver* has a long, fairly heavy blade, and is used for skiving, or beveling, old soles (Fig. 203).

SIZE	LENGTH OF BLADE IN INCHES
2	6¼
3	6⅝

Fig. 203. Round-point heavy skiver.



The *straight square point* is a utility knife, used for all manner of leather cutting, including the skiving of new soles when no skiving machine is on hand (Fig. 204).

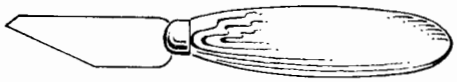
Fig. 204. Straight square point knife.

SIZE	LENGTH OF BLADE IN INCHES
0	2
1	2⅛
2	3
3	3⅝
4	3⅞
5	4¼

The *McKay* is a handy knife for cutting in close quarters as well as for riping. It is also ideal for cutting the threads on soles after stitching (Fig. 205).

SIZE	LENGTH OF BLADE IN INCHES
1	2½

Fig. 205. McKay knife.



The *round-point thin skiver* is a very thin flexible-blade knife for skiving upper leathers, especially for patching purposes (Fig. 206).

SIZE	LENGTH OF BLADE IN INCHES
3	4⅞

Fig. 206. Round-point thin skiver.

The *lip knife*, either curved or straight, is used strictly for trimming, thus the protective lip (Fig. 207). This knife, unlike the others, is beveled on the lower side of the cutting edge, and should be kept that way when sharpening for efficient use. This knife *never* should be honed or whetted on the front side of the blade. It comes either right or left handed.

SIZE	LENGTH OF BLADE IN INCHES
00	1¾
0	2
1	2¼
2	2½
3	2¾

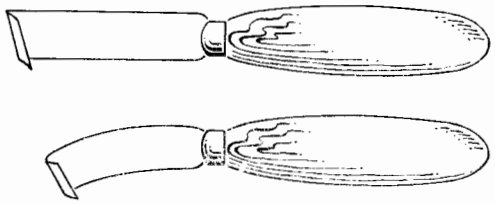


Fig. 207. Lip knives.

The *tapered lip* is almost a duplicate of the lip knife (Fig. 208). It is slightly narrower, and is used especially for trimming the top lifts of wooden heels. The length of its blade is 1⅝ in.

Fig. 208. Tapered lip knives.

For all-round shoe-repair purposes, a smooth-face hammer should be used because it will not mar the leather. If a rough hammer were used, it would be necessary to sand away quite a bit of the wearing surface of the sole to get rid of the hammer marks so that a good finish could be produced.

Some shoe repairmen think that unless the face of the hammer is corrugated the nail will spring out from under the hammer blow. This is not the fault of the hammer, but the angle at which the blow is struck. It is caused either by holding the hammer incorrectly, or working on a stand, or jack, that is too high for the operator. Oftentimes it is because the shoe does not set firmly on the last. Sometimes this can be corrected by using a hammer with a different pitch, as those shown in Figures 209 and 210.

When driving nails where the hammer does not come directly or forcefully in contact with the leather, as heel nails, hobnails, conehead nails, etc., it is well to use a corrugated-face hammer. Here it will do no damage and work can be done more rapidly.

A hammer that is found very necessary by every shoe repairman is a tack hammer. This hammer is used when attaching wooden heels and for tacking the inside of shoes (Fig. 211).

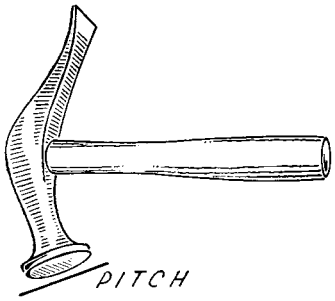


Fig. 209. French hammer.

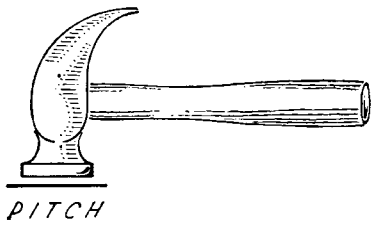


Fig. 210. Smooth-face hammer.

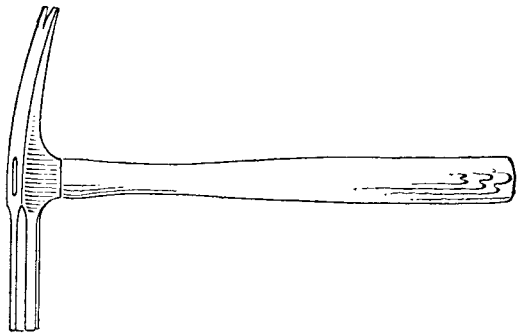


Fig. 211. Tack hammer.

SEWING AWLS

Another very important tool in good shoe repairing is the sewing awl. The awl is used to make holes in heavy or hard leather where hand stitching is required, principally when resewing inseams or attaching new welts.

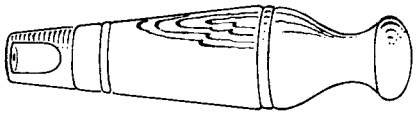


Fig. 212. Short-nut sewing-awl haft.

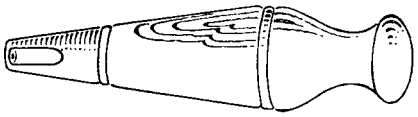


Fig. 213. Long-nut sewing-awl haft.

Fig. 214. Curved sewing awl.

Fig. 215. Stabbing awl.

Two basic kinds of hafts, or handles, are available (Figs. 212 and 213).

For general, all-round sewing, a short-nut haft (Fig. 212) fitted with a No. 7 sewing awl is recommended (Fig. 214). For other hand sewing, where the leather is too heavy for the needle to go through, as for instance in some uppers, or wherever a fine hole is needed, a long-nut haft (Fig. 213) fitted with a No. 106 stabbing awl should be used (Fig. 215).

NIPPERS AND CUTTERS

Nippers. To have a complete set of tools, it is very necessary that *heel pincers*, or nippers (Fig. 216), be included. These nippers are used to remove worn layers, or lifts, of heels which need replacing. One handle of the nippers is usually fitted as a pry for loosening or raising lifts to enable the repairman to get a good grip.

Cutters. A cutter is much sharper than nippers (Fig. 217). It is used to cut off nails, especially those in heels when one or more lifts have been removed. These nails always should be cut off and never driven down.

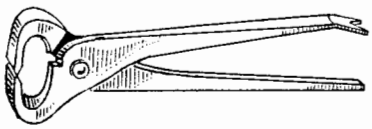


Fig. 216. Heel pincers or nippers.

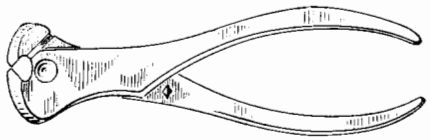


Fig. 217. Cutters.

DIAGONAL CUTTER

Diagonal Cutters. Too many shops are without the diagonal cutter, which is an important tool (Fig. 218). Many times, when old soles are ripped from shoes, staples, or other metallic fasteners are found which should be clipped off. If they are pulled out, the inseam stitches may be torn, or the lip on the inner sole, to which the uppers and the welt are attached, may be damaged. The diagonal cutter also is very useful for removing tacks from places not easily reached.

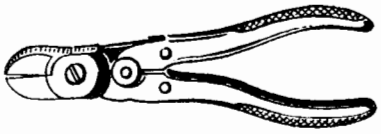


Fig. 218. Diagonal cutters.

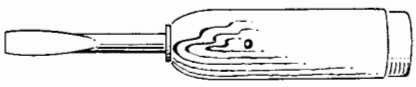


Fig. 219. Heel pry.

MISCELLANEOUS TOOLS

Heel Pry. The heel pry is merely a wide-bladed screwdriver (Fig. 219). It is used to separate layers, or lifts, on heels, just enough so that they can be easily gripped with heel nippers. It is oftentimes very much misused as it is driven under a tightly fitting heel, thus leaving indentations that cannot be removed.

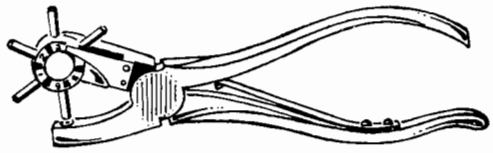


Fig. 220. Revolving punch.

Revolving Punch. The revolving punch has several sizes of tubes used to punch holes in leather. It is very necessary when repairing or replacing eyelet stays and for perforating toe caps that need to he replaced. It is advisable to have a six-tube punch to take care of the different sizes of eyelets and toe-cap perforations.

Fig. 221. Nail set.

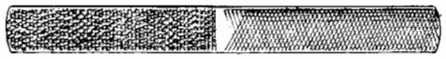


Fig. 222. Rasp.

Nail Set. The nail set is used in attaching rubber heels to set the nails below the surface of the heel (Fig. 221).

Rasp. A rasp has many uses in shoe repairing (Fig. 222). It is necessary for hand roughing, making paper patterns (Fig. 86), removing excess leather, and many other smoothing operations both inside and outside the shoe.

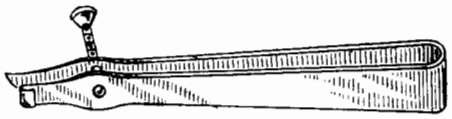


Fig. 223. Groover.

Groover. When soles are stitched to shoes, it is important that the stitches be protected, especially during the scouring operation. Because channeling is difficult and has no particular value outside of its appearance, most shoes are stitched *aloft*. This means that the stitches can be seen on the bottom of the shoe. To protect these stitches, however, soles are grooved, and the stitches lie in this groove slightly below the surface. Figure 223 shows a tool used for this purpose.

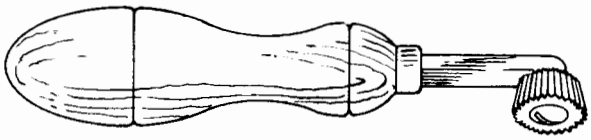


Fig. 224. Fudge wheel.

Fudge Wheel. The fudge wheel is used to give a resole job a finished appearance. It is actually a stitch impression wheel, giving the new sole job a sewed appearance. It is used on all types of shoe construction where the sole extends beyond the upper (Figs. 42 and 54 to 58). The cogs are spaced to represent the number of stitches per inch.

Roughing Wheel. The roughing wheel is an economic, efficient way to rough leather. It eliminates the uneven or slow hand-roughing jobs (Fig. 225). Coming in wheels 1 in. wide x 4 in. diameter, the wheel will fit all standard finisher shafts.

CAUTION: Do not use on welts, upper leathers, or other finished surfaces.

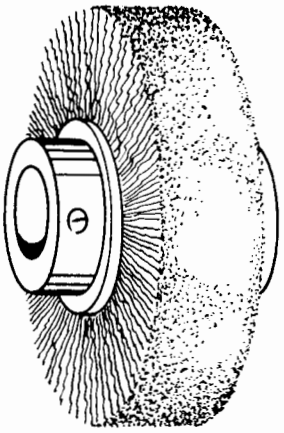


Fig. 225. Roughing wheel.

REVIEW QUESTIONS

Shoe Knives

1. Why is it well to have an assortment of knives?
2. How should knives be cared for?
3. What is a hawkbill knife used for?
4. For what is a round-point heavy skiver used?
5. What knife is used for all kinds of leather cutting?
6. What work is done with a McKay knife?

7. What is a thin flexible-bladed knife used for?
8. What knife is used strictly for trimming? How is it beveled?
9. What is almost a duplicate of the lip knife? What is its use?

Hammers

10. What type of hammer is best suited for all-round purposes?
11. Why should the leather be marred as little as possible?
12. What is the reason for nails springing out from under a hammer blow?
13. What is meant by the pitch of a hammer?
14. For what kind of nails can corrugated-faced hammers be used?
15. For what purpose does a shoe repairman need a tack hammer?

Sewing Awls

16. For what is a sewing awl used?
17. What is a short-nut haft? A long-nut haft? For what are they used?
18. For what purpose are heel pincers or nippers used?
19. What is the difference between a cutter and nippers? For what is a cutter used?
20. What is the purpose of diagonal nippers?
21. What is a heel pry? How is it oftentimes misused?
22. What type of revolving punch should a repairman have? What is its use?
23. What is the purpose of a nail set in shoe-repair work?
24. For what is a rasp used in shoe repairing?
25. What is the purpose of a groover when stitching soles?
26. For what purpose is the fudge wheel used?
27. Why is it necessary to roughen up a piece of leather?
28. What advantage does a rougher have over hand roughing?
29. What shoe parts should be roughened by hand? Why?

GENERAL QUESTIONS

1. Have good tools any value other than for efficiency in work? Explain.
2. List in order of importance the tools discussed in this chapter.
3. How can the cost of tools be kept at a minimum?

CHAPTER 10

Nails and Threads

In all types of shoe nails, with the exception of lasting tacks, the length is given in eighths of an inch.

Half sizes are not given in sixteenths, as would be expected, but in half eighths. For example, the size between 3/8 and 4/8 is 3½/8. Beginning with 3/8, the sizes are 3½/8, 4/8, 4½/8, 5/8, 5½/8, etc.

The thickness of shoe nails is given in gauge numbers ranging from 11 to 20, as shown in the following table:

GAUGE NO.	INCH
11	.120
12	.109
13	.095
14	.083
15	.072
16	.065
17	.058
18	.049
19	.042
20	.035

The smallest number, 11, indicates the heaviest nail, and No. 20 is the lightest weight shoe nail.

CLINCHING NAILS

Clinching nails are slender nails used for attaching leather soles (Fig. 228). Part of the shank is corrugated and the point has a peculiar shape. It is straight on one side and tapered on the other side. The points are shaped this way so that the repairman can be sure of the direction in which a nail will clinch. He can thus prevent the nail from turning in the wrong direction and possibly puncture the uppers. When fastening a sole, therefore, nails should be started with the straight side facing the center of the shoe because that is the direction in which the nail will clinch.

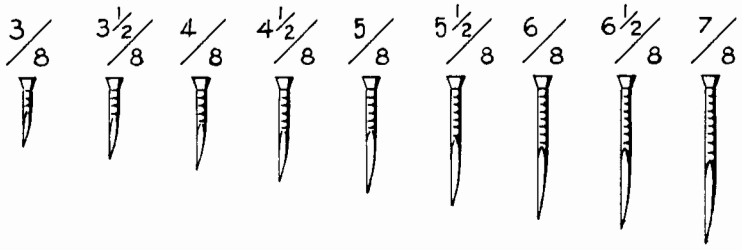


Fig. 228. Clinching nails.

Nails should be selected a half size longer than the thickness of the material to be nailed so that enough of the point will be left for clinching.

RUBBER-SOLE NAILS

The rubber-sole nail is similar to the leather-sole nail, but it is a little heavier and its head is somewhat larger to keep it from pulling through the rubber sole (Fig. 229).

RUBBER-HEEL NAILS

Nails used for attaching rubber heels are made in many different ways by different manufacturers, but they are all heavy nails, about 13 gauge, with a large head (Fig. 230).

Fig. 229. Rubber sole nails.

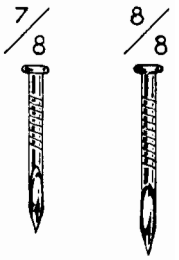


Fig. 230. Rubber-heel nails.

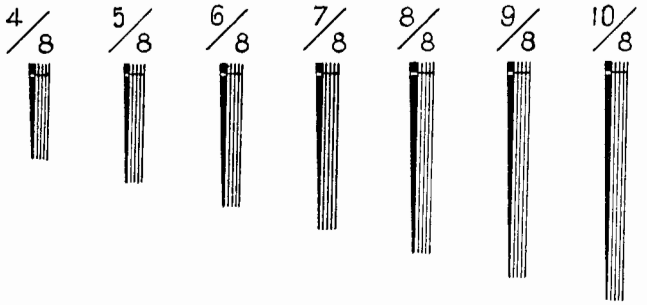


Fig. 231. Leather-heel nails.

LEATHER-HEEL NAILS

Leather-heel nails are also known as *Swedes nails* and *iron-heel nails.* It is a square nail, without a head, and tapers down to a blunt point (Fig. 231).

WOODEN-HEEL ATTACHING NAILS

The wooden-heel nail is merely a brad with a flat head (Fig. 232). Besides the head, the only difference between a brad and this nail is that the latter is corrugated the full length of the shank. They are made in light gauges in all lengths.

PLASTIC-HEEL ATTACHING NAILS

Plastic-heel nails (Fig. 233) are similar to wood heel attaching nails. However, the plastic-heel nail has helical grooves that give the nails a screw-like holding power.

BRADS

Brads used in shoe repairing are similar to those used in woodworking, with the exception that these have a much sharper point (Fig. 234).

In shoe work they are used in attaching leather lifts to wooden heels. They are, therefore, made in all required sizes in a very light gauge.

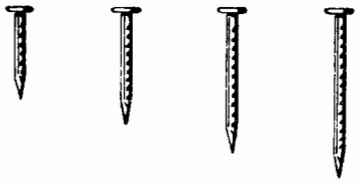


Fig. 232. Wooden-heel attaching nails.

Fig. 233. Plastic-heel attaching nail.

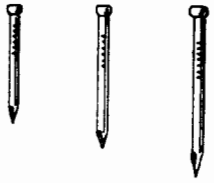


Fig. 234. Brads.

SHOE TACKS (LASTING TACKS)

This is a very sharp-pointed, flatheaded tack used for various purposes such as attaching flexible leathers to more rigid types as is done in the lasting operation (Fig. 235).

This is the only type of shoe nail in which the length is not given in eighths of an inch, but in ounces. The following table will be a help in comparing the lengths of these tacks with other nails:

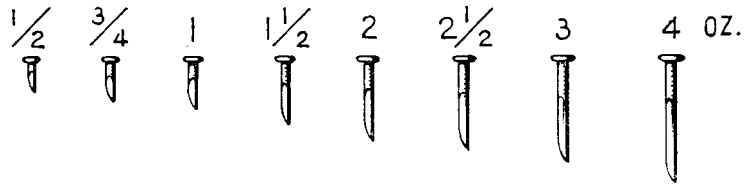


Fig. 235. Shoe tacks.

Ounces	1/4	1/2	3/4	1	1 1/4	1 1/2
Inches	1/8	6/32	1/4	10/32	11/32	12/32
Ounces	1 3/4	2	2 1/2	3	3 1/2	4
Inches	13/32	14/32	16/32	18/32	19/32	20/32

SHOE THREADS

Shoe threads are divided into two groups, each to meet a certain need. One group of threads is used in sewing uppers, and the other for heavier duty such as attaching shoe bottoms. Threads used by repairmen should be selected with as much care as is done by manufacturers of new shoes. The amount of service given by threads depends a great deal upon the type and place of the seam as well as the kind of leather to be stitched. Very little stitching is done by hand; therefore, there is additional strain from the action of the machine. To meet these requirements, threads should have the following qualities:

1. Possess durability.
2. Be able to withstand friction.
3. Have elasticity.
4. Will pull in or seat properly.
5. Have a good finish.

Upper Threads. Threads used for stitching uppers and for patching are made of nylon, silk, linen, and cotton (Fig. 236). Of these, nylon and silk make a neater and more lasting job.

Machine stitching requires an upper thread and a lower, or bobbin, thread. Both threads, however, need not be of the same quality or material. Therefore, either linen or cotton, preferably linen, may be used as a bobbin thread in combination with nylon and silk.

Bottom Threads. Threads used for attaching bottoms should be more or less elastic but strong enough to produce a firm seam (Fig. 237). This seam is given very hard wear. It, therefore, should be sewed with good linen thread made of the best quality flax.

For most types of chain stitching or any seams which are supported by other reinforcements, a good cotton thread will do.

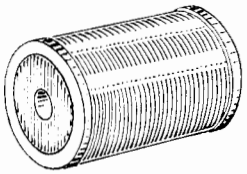


Fig. 236. Thread used to stitch uppers.

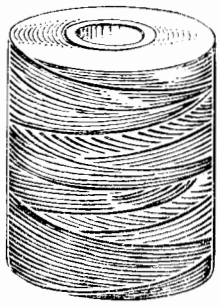


Fig. 237. Thread used to stitch bottoms.

Fig. 238. Thread to be waxed.

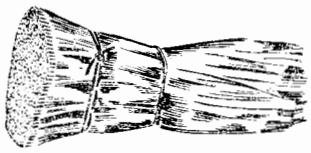


Fig. 239. Hog bristles.

Waxed Threads. Shoe repairmen often have need of a very strong thread for stitching heavy leather seams which cannot be done on a machine, such as resewing and attaching welts (Fig. 238). The type of stitch used for this purpose (Fig. 88) cannot be made with a needle. Instead, hog bristles are used in place of a needle (Fig. 239). Since the bristle has no eye to receive the thread, it must be attached to a specially prepared thread. The ends of this thread, after the bristle has been attached, may not be thicker than the balance of the thread, otherwise it will catch in the leather and the bristle will be stripped from the thread. The thread can be made any desired strength by merely adding more strands. The thread is prepared according to the following procedure:

1. Determine the length and strength of the thread to be made (see "Mending Welts," page 47 ff).
2. The thread must have a feathery edge. If the leading end of the thread is new or has been cut or broken cleanly, unreel a short length. Then twist the thread until you can see the fibers (Fig. 240), and snap it, giving a feathery edge (Fig. 241). If the thread already has a feathery edge, go at once to step 3.

Fig. 240. Untwist thread until you can see through fibers.

Fig. 241. Snap thread which will sever it with feathery ends.

Fig. 242. Thread rolled and waxed.

3. Unreel one strand the desired length of the thread.
4. Untwist the thread until you can see through the fibers (Fig. 240).
5. Give it a quick snap. This will sever the thread with a feathery end (Fig. 241).
6. Repeat the operation with each strand that you add to the thread. The number of strands will depend on the strength desired. Each subsequent strand should be 2 in. shorter than the one before it.
7. When all the threads are ready, place them so that their centers are in line. Each thread will then be placed so that it is one inch shorter at each end than the next longer thread.
8. Bind the ends tightly together by rolling them along your thigh with the palm of the hand. Then apply hand wax which will produce a long tapered needle-point end (Fig. 242).
9. Roll, or twist, the balance of the thread in the same manner. To do this, fold the thread to form a loop, so that both ends are even. Hook the loop over some object. Then hold one end so it will not interfere while rolling the other end. When this has been done, roll the other end, but in the same direction.
10. Grasp both ends in one hand so that one finger separates the two threads, and wax well. Rub the waxed thread briskly with a piece of cloth or soft scrap leather so that the wax is smoothly spread to all parts of the thread. You will now have one continuous waxed thread which tapers at both ends.
11. Take a hog bristle and hold it at the middle, between the thumb and index finger, with the root end downward. The root end has the shape of a bulb, and the tip usually is split.

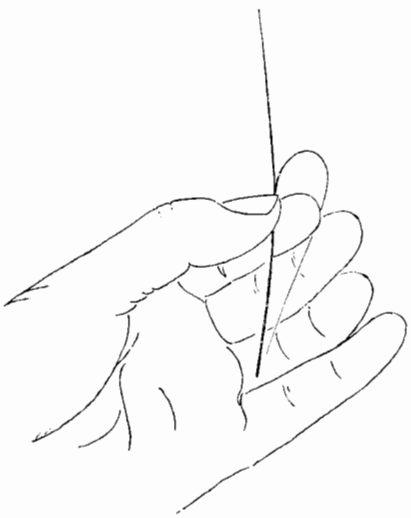


Fig. 243. Bristle split halfway down.

Fig. 244. Tip of bristle inserted through hole in twisted thread.

12. Locate the center of the split, and continue to split it halfway down the length of the bristle, or to where it is being held between the finger and the thumb (Fig. 243).
13. Bend one half of the split end around the index finger, and grasp it between the index and middle fingers (Fig. 243).
14. Place the end of the hairlike tip of the waxed thread into the opened crotch of the bristle.
15. Release the bristle end that was held between the index and middle fingers, and twist it well into the thread.
16. Twist in such a manner that the thread does not overlap but lies side by side, otherwise it will become too thick which will cause the thread to be stripped from the bristle while sewing.
17. Poke a hole through the twisted thread somewhere between the crotch and the end of the bristle (Fig. 244).
18. Insert the tip of the bristle into this hole and pull it through, thus locking in the bristle (Fig. 244).
19. Repeat the entire operation of preparing the end with the bristle at the other end of the thread, as just described.
20. When sewing, never pass the thread over the joined edge. Insert one end of the thread and pull it through until the center of the thread has been reached, so that an equal amount of thread extends on each side of the edges that are to be joined, as shown in Figure 156.
21. Punch one hole at a time as you sew, and always enter the thread

Fig. 245. Wire bristle. 

simultaneously at the same side from which it protrudes from the leather, as shown in Figure 88. Do not cross over.

22. Pull the bristles through at the same time, passing each other in opposite directions, otherwise the thread may be stripped from the bristle.
23. If one end passes through freely while the other sticks, do not force it. Pull the free end partially through, then pull it back again taking the tight thread on through with it.

Ready-made waxed threads in a few lengths with wire bristles attached are now available at some finding jobbers (Fig. 245).

REVIEW QUESTIONS

Nails

1. How are the length and size of shoe nails given?
2. What are clinching nails? How are they used?
3. What is the difference between rubber-sole nails and leather-sole nails?
4. What type of nail is used to attach rubber heels?
5. What other name is given to leather-heel nails? How are they shaped?
6. What are the differences between a wooden-heel attaching nail and a brad?
7. What characterizes a plastic-heel attaching nail?
8. What is the purpose of a lasting tack? How is it shaped?
9. How is the length of a lasting tack given?

Threads

10. Into how many groups are shoe threads divided? What qualities should they have?
11. What are upper threads? Of what are they made?
12. What are bottom threads? Of what are they made?
13. What kind of thread is used for stitching heavy leather?
14. What is used in place of a needle when sewing with waxed threads?
15. Can this thread be bought or must it be made by the repairman?

GENERAL QUESTIONS

1. How may the required quantity of each type of nail be estimated?
2. Show how using the wrong kind of nail may lead to difficulties.
3. What are the main types of thread?
4. Illustrate the importance of using the correct kind of thread.

CHAPTER 11

Leather

The technical development of leather tanning has been very rapid within the past years, resulting in a greater variety of fast and uniform colors as well as much better finished leather. Although much has been done with the improved tanning methods, the quality of the pelts cannot be changed. Such qualities depend greatly upon the climate in which the animal lived, its feeding, the season in which it was slaughtered and its age at that time.

Leather is a by-product of the wool, dairy, and meat industries and must be taken as it comes. The majority of pelts are from cattle raised here in the United States and most of those which are imported come from South America. Packing and methods of preserving during transit are all important factors in the value of imported leather.

PICKLING OR PRESERVING

These pelts, before they are pickled, are said to be *green.* Some are preserved by stretching and drying them in the sun. Most of them, however, are pickled by piling them in layers with salt between the layers, which forms a brine. After about thirty days this brine has thoroughly penetrated the pelts. They are now considered *cured* and ready for tanning.

WEIGHTS

When a pelt weighs more than 25 pounds, it is called a *hide;* when it is between 15 and 25 pounds, it is known as a *kip:* and those less than 15 pounds are *skins.*

PREPARING HIDES FOR TANNING

Although the first steps, such as softening, cleaning, trimming, fleshing, unhairing, etc., are the same for all kinds of pelts, the tanning process

differs for each weight group because each is used for a different purpose. While hides are used for soles, harnesses, and leather beltings, the lighter weights are made into boot and shoe uppers, purses, etc. Most hides are vegetable tanned; for many years oak, hemlock, and chestnut were extensively used in tanning. But blight and deforestation have led to the importation of various vegetable tannins from such places as South America, India, and Africa. Today over 80 percent of the tannage used in the United States is imported, the largest single source being the quebracho wood found in South America. The extract of this wood produces a soft, mellow leather.

CHROME

In the late nineteenth century, a new tanning method was perfected. Utilizing chromium compounds, the chrome method produces a very soft, pliable, bluish-green leather. Chrome-tanned leather wears better and longer than vegetable-tanned, and more so when it remains unwaxed. Since in this state it absorbs water more readily, chrome sole leather is wax or grease filled which makes it stiffer but water-resistant.

This method of tanning is used almost entirely in the tanning of leather for shoe uppers because a multitude of colors, glazed finishes, and prints for the manufacture of women's shoes can be produced.

RE-TAN

A further development of this tanning method is to put chrome-tanned leather also through a vegetable-tanning process. This will make a flexible but tough sole leather, known as *re-tan.*

SPLITTING

Thick skins, such as cattle hides, are split to be used for various purposes (Fig. 250). In one method of splitting, a thin layer first is removed from the grain surface or hair side. This piece can be identified by hair-lines, scratch scars, etc. When it is too badly scarred, the outer or top grain is removed and is replaced with an artificial grain. The rest of the hide then is split into layers of equal weight. The lower splits are artificially grained for use in cheaper shoes, or they are embossed for other uses. These split layers are used when there is a need for firm but not too expensive leather for some types of shoes, luggage, inner soles, upholstery leather, work gloves, etc.

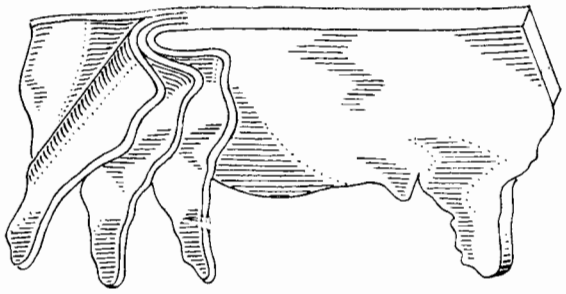


Fig. 250. Split cattle hides.

FINISHING

Skins undergo a shaving process to create a uniform thickness. This is done by forcing the skin, flesh side up, through a machine with rollers, the top one of which has a large number of rapidly revolving blades. Skins then are smoothed, flexed, oiled, and ironed, after which they are put through the finishing or seasoning operations. In this procedure, colored waxes and oils are worked into the leather which has been previously dyed to the desired color, thus setting and giving the desired depth and richness to the colors.

SOLE LEATHER

The terms, *upper* leather and *sole* leather, are used merely to identify the more rigid and heavier types of leather from the lighter and softer kinds. The heavier leathers are used in shoe bottoms, such as outer soles, slipsoles, heel leather, counters, rands, welts, etc. The lighter weights are used in shoe tops, such as vamps, quarters, toe caps, tongues, etc., which are known as the *uppers* after they have been assembled.

Bottom leathers, especially the outer sole, which is subjected to more moisture and harder wear than any other part of a shoe, are obtained from heavier cattle hides. This does not mean that leather, in order to give satisfactory wear, must be heavy and hard. Sole leather is tanned hard or flexible according to the use for which it is intended. For instance, if a shoe or boot is required to hold calks or other wear-resisting accessories, the leather must be hard to hold these calks firmly in position. If, however, leather is tanned for ordinary shoe soles, it may be just as strong as that which has been tanned harder, if it is taken from the same part of that hide. The difference in the several parts of a hide probably will be best understood if it is compared with the different cuts of meat from a certain animal.

LEATHER GRADES

By comparing Figure 251 in which the various grades of meats are outlined, with Figure 252, which shows the different grades of leather, it will be found that the better grades of meats are covered by the better parts of the hide. This comparison, therefore, will convince anyone that the entire hide cannot have the same wearing quality, and thus all of it cannot be used for outer soles which must be made of good quality leather.

Hides are cut in half lengthwise along the backbone to make it easier for handling. The better parts, which amount to only about 50 percent of the hide, are usable for outer soles. These parts are called *bends*. The rest of the hide, consisting of the shoulders and belly, can be used for other purposes (Fig. 253). Bends are sold by the pound and are sorted into weight grades such as light, medium, heavy, and extra heavy.

Bends also are sorted according to thickness which is measured by a gauge known in the shoe industry as an *iron* and is equal to ¼s in. This measurement is necessary because very often bends of equal weight

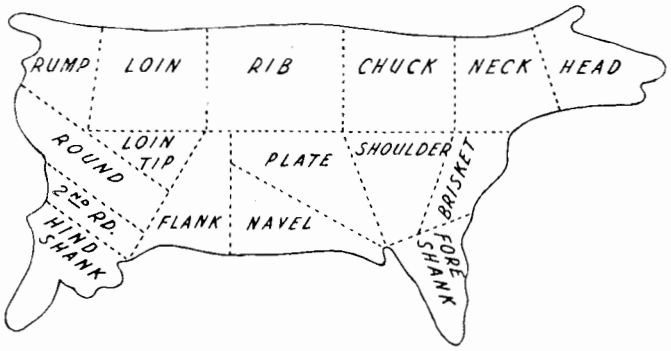


Fig. 251. Meat cuts.

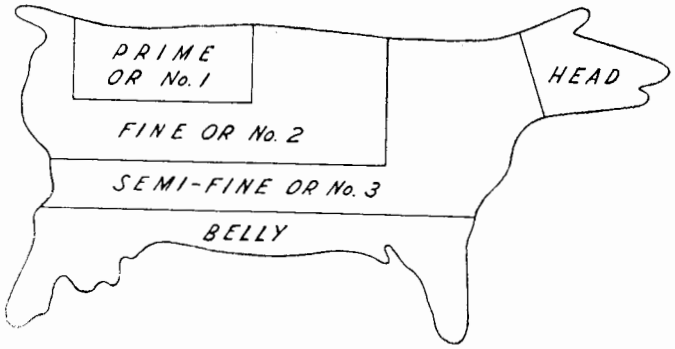


Fig. 252. Leather grades.

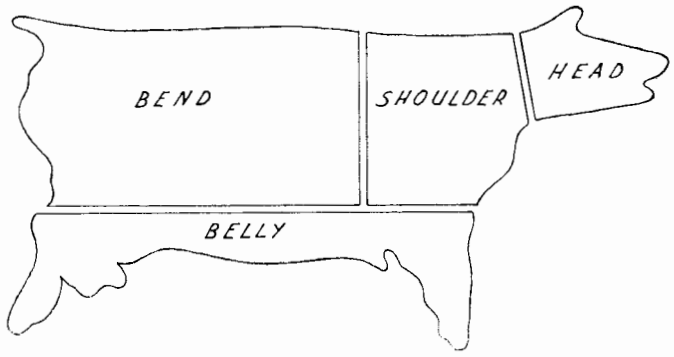


Fig. 253. Bends.

are quite different in thickness. Individual bends do not have the same thickness throughout, and for that reason must be measured at a point that will strike a fair average, which usually is about 18 in. from the root of the tail. Bends are sorted into weight grades and are sold according to the different grades. Grades are determined by clearness and texture, and are termed as follows:

Prime: Select texture, and free of brands, cuts, and other defects.

Clear: Good texture, and free of brands, cuts, and other defects.

A grade: Select texture, but with brands, cuts, or other defects not to exceed the size of a tap, which is a half sole.

B grade: Bends with brands or other defects equal to two or more taps.

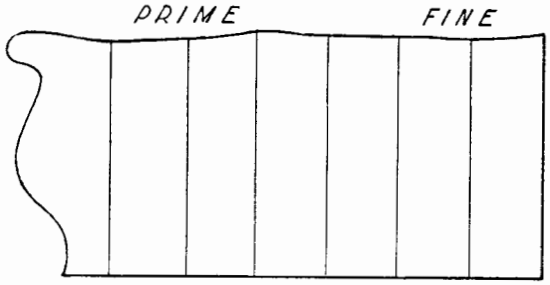


Fig. 254. Leather grades.

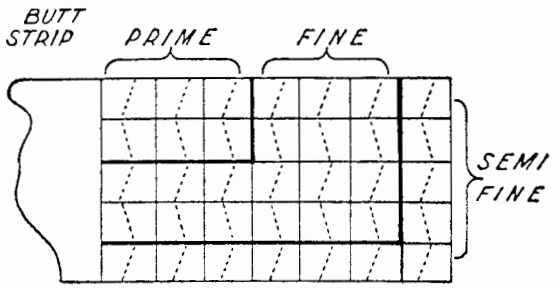


Fig. 255. Taps.

STRIPS AND TAPS

To enable small shops to buy in small quantities, and to eliminate the leather which is not the same grade, bends are cut into strips (Fig. 254) 5, 6, 8½, 11, and 13 in. wide. Since each bend is not of the same grade and weight throughout, these strips must be assorted accordingly. To further set apart grades, bends also are cut into taps which again are graded and made ready to sell to the busy shop owner. A small shop owner may have the time to cut his own taps, but as a result, he may have a pair of taps which he cut from different parts of a bend or from different bends and, therefore, may not be mates so far as grade and weight are concerned (Fig. 255).

CORRECT-WEIGHT SOLES

It is very important, when shoes are resoled, that the new soles be of the correct weight for that particular shoe. A manufacturer always selects the correct-weight sole for certain foundations and lines in a shoe, in order to keep the proper balance. Good shoe repairing, therefore, requires that this balance be kept and that the foundation will not be weakened.

If a shoe is brought in for resoling on which the uppers will last only another few months, a sole of the same weight but of a poorer grade will answer the purpose. Or, if a customer asks for a lighter sole, one of more flexible leather will solve the problem. On the other hand, if a heavier sole than the original is attached, it may collapse the foundation and completely ruin the shoe.

WEIGHTS AND GRADES

Most taps at the present time are cut at various oblique angles (Fig. 256), and are known to the trade as *angle taps*. Formerly these taps

Fig. 256. Oblique-angled tap.

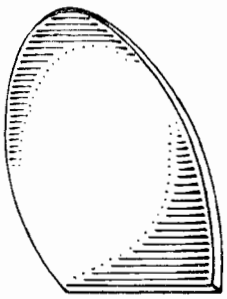


Fig. 257. Shaped tap.

were cut to the correct shape (Fig. 257). Taps still can be bought shaped, but to a much lesser extent. They are sorted according to grade and thickness, and are sold in bundles of one dozen pairs. The thickness of the taps is measured by the iron, which is 1/48 in. The number of inches to the dozen pair of taps can be found by dividing by two the iron thickness of a piece of leather from which a tap has been cut. For example, a tap which measures 12 irons or 12/48 in. thick (Fig. 258), stacked into bundles of 24 soles or 12 pairs, will measure 288 irons or 6 in. to the bundle (Fig. 259). This applies to all weights, and in order to find the iron thickness of one tap out of a stack, the number of inches should be multiplied by 2.

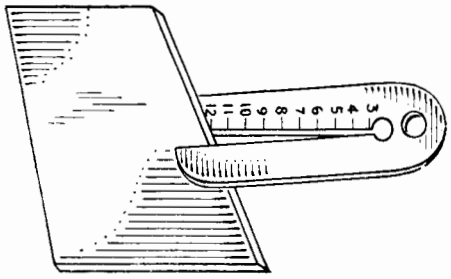


Fig. 258. Measuring iron thickness of tap.

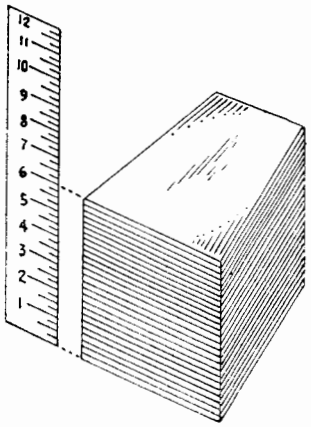


Fig. 259. Bundle of taps.

SUMMARY

Leather is measured for thickness by the *iron.*

Taps, or cut soles, are sold in bundles of 12 pairs each.

Taps, when tied into bundles of 12 pairs, are measured for thickness by inches and half inches.

For example: 1 iron equals 1/48 in.

1 sole cut from 11-iron leather equals 11/48 in.

1 bundle of 12 pairs (24 soles) equals 264 irons or 264/48 in.

Thus, if 48 irons equal 1 in.,

264 irons will equal 5½ in., or 5½-in. taps.

NOTE: By dividing the iron thickness of the leather, from which the soles are cut, by 2, we have the inch thickness of a 1-dozen-pair bundle.

To find the iron thickness of a tap, merely multiply the inch thickness by 2.

This detailed explanation should help to understand the term *inches* as applied to taps, in which manner they are sold, as for instance, 3½ in., 4 in., 4½ in., etc., and its relation to the iron-gauge measurement.

TEMPERING LEATHER

It is very advantageous to have pliable soft sole leather so that the repairman can work with the leather easily and without danger of damaging it. The process of making sole leather soft and pliable is called tempering. Tempering methods differ slightly, but basically the leather is dipped into water and subsequently kept moist. However, caution should be exercised; a shoe can be completely ruined by soaking the shoe leather too long, which will loosen the leather fibers and thereby destroy its wearing qualities. Furthermore, when sole leather is still too wet at the time it is attached to the shoe, its natural shrinkage will make it too small. This will create an unsightly, uncomfortable shoe, as well as putting an unbearable strain on the inseam and the attaching seam.

The term *tempering* here may be a little confusing, and it may be more correct to say that the leather is *humidified* because it really is mellowed by keeping it in a humid atmosphere. This can be easily done by using a metal container with a snug-fitting cover into which is fitted an extra bottom, shelf, or ledge made of screen or wire netting (Fig. 260).

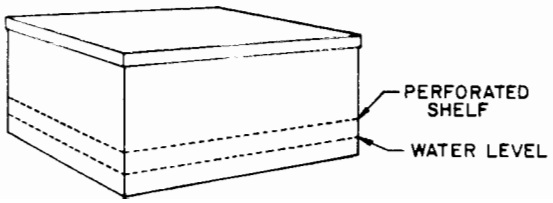


Fig. 260. Tempering box

The container should be filled with water to just below the level of this bottom or ledge. The leather should be dipped into water for a minute or two, and then placed on the screen or netting, closing the lid tightly.

If you do quite a bit of cemented work, the soles should be roughened, skived, and given a coat of cement before placing them into the tempering box. When the soles are needed remove them 5 or 10 minutes before using. Give them another light coat of cement and permit them to become tacky before attaching. In this way, a two- or three-day supply always can be kept mellow. If any of the leather shows signs of mildew, this should not be alarming because it will do no harm.

A less satisfactory but cheaper method is to soak the leather from 5 to 10 minutes and then wrap it in newspaper and burlap or oilcloth.

UPPER LEATHERS

Leather for uppers is measured for thickness in a different manner than sole leather. These weights are given in ounces instead of irons. Here the ounce is based on the average weight per square foot. For example, a skin measuring 12 sq. ft. and weighing 3 lb. (48 oz.) would average 4 oz. per square foot. It would, therefore, be known as a 4-oz. skin. A system of measurement has been devised that is more reliable than the scale weight. The thickness of the leather is determined by the use of a gauge (Fig. 261). The term "ounce" has been retained and is comparable to $\frac{1}{64}$ inch. Thus the above 4 ounce skin would be $\frac{4}{64}$ inch thick.

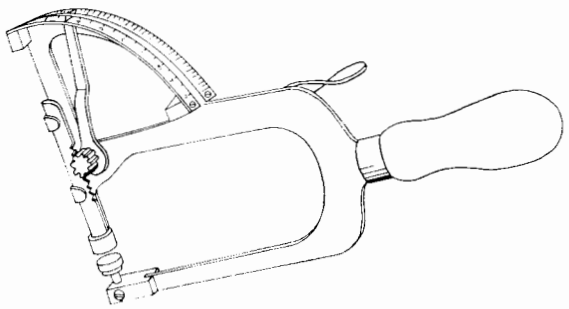


Fig. 261. Leather guage.

CALFSKIN

Calfskin is used for shoe uppers more than any other leather because it has strong, closely knit fibers and a very fine, deep-seated grain, as a result of which this leather is not easily scuffed (Fig. 262). It is the most satisfactory and serviceable leather for all-round use. The finest

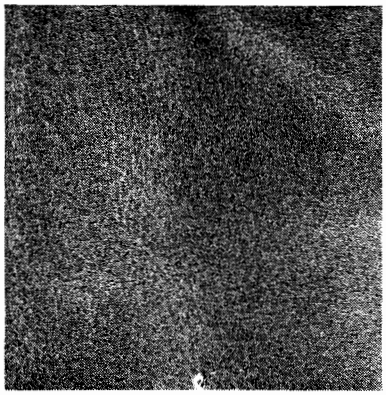


Fig. 262. Calfskin.

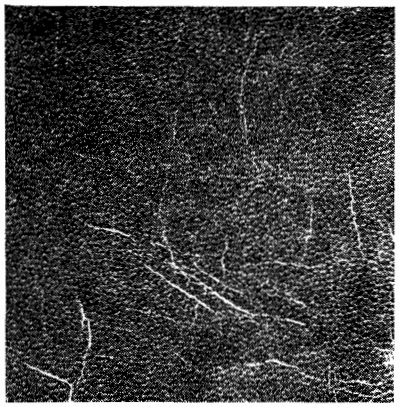


Fig. 263. Kidskin.

men's and women's shoes as well as sport, semidress, and work shoes, and many other commodities are made of calfskin.

Through modern embossing methods, calfskin has been transformed to resemble the skins of many other animals and reptiles. Such transformations are not only perfect and permanent, but they give much better service than the natural skins of the animals or reptiles imitated.

Many other types of leather are produced from calfskins, such as patent leather, glazed calf, boxed calf, and a large assortment of smooth finishes, as well as top-grade suede or ooze.

The finest calfskin is imported from countries where the animal is killed before it has taken to grazing, that is, unweaned or milk-fed calves.

KIDSKIN

Although a large proportion of the so-called kidskins are really goatskins, improved tanning and finishing methods have so developed its fine qualities that it is now one of the most desirable leathers for shoe uppers. Its soft, pliable texture does not detract from its wearing quality (Fig. 263).

It has been possible to produce scores of fast colors in this leather, which makes it most suitable for women's footwear. Because it is a very lightweight leather, it requires no splitting. Therefore, it keeps all of its natural qualities, making it an outstanding leather for high-grade shoes.

PIGSKIN

Even though a tremendous number of pigs are slaughtered annually in the United States, most of the pigskins used for commercial purposes are imported. Pigskins have many imperfections, and since there is no

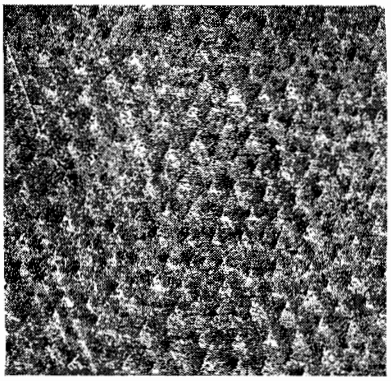


Fig. 264. Pigskin.

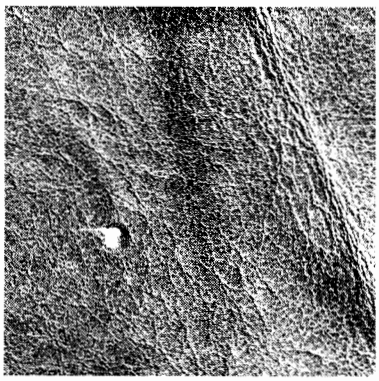


Fig. 265. Sheepskin.

particular line of separation between the skin and the fat, the skinning or paring operation takes considerable time. In spite of this, however, many skins are removed in whole or in part because there is a great demand for the type of leather obtained only in pigskin.

Pigskin will not scuff or peel because there is no division between the grain and the fiber body of the skin. While it is one of the strongest hard usage leathers, it is also very flexible and lends itself readily to the manufacture of counters, welting, inner soles, and a large number of other things.

It is especially suited for summer and sportswear shoes as it is quite porous because the hairs penetrate the entire thickness of the skin. Pigskin oftentimes is imitated and is not easily identified by one not familiar with leather (Fig. 264).

SHEEPSKIN

This is the most useful of all leathers, not because it is the least expensive, but because it is so flexible. It is produced in large quantities and for a greater variety of purposes than any other leather. It is used for gloves, garments, bookbinding, and in the manufacture of shoes, but mostly in the cheap grades. Shoe linings, slippers, sock linings, and facings also are made of sheepskin.

Sheepskin cannot be classed as a hard-usage leather because it has very loose fibers, absorbs water readily, is very stretchy, and scuffs easily. The layers of the skin can be easily separated. The upper or grain side is used in the manufacture of many things where it can be reinforced or backed.

HEAVY UPPER LEATHERS

Heavy upper leathers are used very extensively in the manufacture of coarse, heavy shoes, called *brogues*, in work and sport shoes and boots, because this leather can be grained and finished in so many different ways. These heavy leathers, made from kips and small cattle hides, also are tanned for use in dress shoes.

Very often the natural grain in these leathers is completely or partly removed and an artificial grain is applied. This makes it possible to use leather which had been badly scarred for the manufacture of shoes.

Many times these kips or sides are too heavy and must be either split or shaved to produce the desired weight (Fig. 250). This, however, does not lessen the wearing quality, and it makes excellent leather for shoes from which hard service is demanded.

REVIEW QUESTIONS

Preserving, Tanning, Finishing

1. What has been accomplished by improved tanning methods?
2. What affects the quality of a pelt?
3. What treatment does a hide receive before it is ready for tanning?
4. How are pelts graded according to weight?
5. What are some of the uses of hides?
6. What is union tannage?
7. What kind of leather is produced with the chrome-tanning method?
8. Why is chrome-tanned leather very frequently used for uppers?
9. Why are certain tannages called re-tan?
10. How can the outer grain of hides which have been split be identified?
11. What is done to this outer grain when it is too badly scarred?
12. Why are skins shaved?
13. After dyeing, why are colored waxes and oils worked into the leather?

Sole Leather, Strips, and Taps

14. What part of a shoe is given the hardest wear?
15. What types of leather are known as upper leather and sole leather?
16. Why is sole leather tanned either hard or flexible?
17. How can the better parts of a hide be identified in comparison with the grades of meat on an animal?
18. What are the names for the better parts of a hide? How are these parts graded?
19. What is meant by iron measurement?
20. Why are bends frequently cut into strips? What is their size?
21. In what other way are bends cut?
22. Is there any advantage in buying taps ready cut?

Correct-Weight Soles

23. How can the correct weight of a sole be determined?
24. What kind of a sole should be used for resoling a shoe on which the uppers are well worn?
25. What may a new sole that is too heavy do to a repaired shoe?

Weights and Grades

26. How were taps formerly cut? How are they cut now?
27. How are taps sorted and sold?
28. How is the thickness of taps measured?
29. How is the iron thickness of a tap found?

Tempering Leather

30. What is meant by tempering leather?
31. What will happen to a shoe if sole leather is attached which has been soaked?
32. What is a better expression than the term "tempering"?
33. How can leather be mellowed so that a two- or three-day supply always is on hand?
34. What is the cheapest method of mellowing leather?

Upper Leathers

35. What term is used in giving the thickness of a skin?
36. How is this weight measurement found?

Calfskin

37. Why is calfskin used so much for shoe uppers?
38. What type of shoes are made from calfskins?
39. Why are calfskins embossed to resemble the skins of other animals and reptiles?
40. How is the finest calfskin obtained?

Kidskin

41. What is one of the most desirable leathers for shoe uppers?
42. Why is this leather so suitable for women's footwear?
43. What other skin is used to imitate the kidskin?

Pigskin

44. Where do most pigskins used for commercial purposes come from?
45. What is an outstanding quality in pigskin?
46. For what is pigskin used?
47. Why is pigskin so well suited for summer and sportswear?

Sheepskin

48. Why is sheepskin the most useful leather?
49. What is sheepskin used for?

50. What qualities in sheepskin make it less desirable?
51. When is the upper or grain side used?

Heavy Upper Leathers

52. What are coarse, heavy shoes called?
53. Aside from its use in heavy shoes, what other shoes are made from this leather?
54. What can be done to badly scarred leather to make it useful in shoes?
55. For what are split or shaved kips or sides used?

GENERAL QUESTIONS

1. Why is some leather better than other kinds?
2. Describe the steps by which leather is tanned.
3. List five important parts of a shoe. Make recommendations as to the best leather to use for each part.

CHAPTER 12

The Care of Shoes

In addition to fit and appearance, the aim of a shoe manufacturer is to make a long-wearing shoe. Manufacturers are continually trying to produce footwear, in both materials and method of construction, that will give the best wear under all conditions for which a shoe has been constructed.

In the first chapters of this book are shown the many different ways of shoe construction which have been made necessary by the many purposes which shoes must serve.

Shoes must not only be made to be able to withstand the elements and the many hard uses to which they are put, but also the inexcusable abuses to which they are subjected. Shoes are specially manufactured for many different purposes, but nobody can control the use to which shoes are put by the wearer, or the wearing of improperly fitted shoes. Some individuals completely neglect the care of their shoes, and they do not have necessary repairs made in time to avoid excessive wear.

DAILY CARE

After having worn shoes all day, they should be thoroughly brushed or wiped clean with a flannel cloth to remove all foreign substances which may become encrusted or work into the leather. If allowed to remain, such substances will mar the finish and give the shoe a faded appearance.

Laces should be loosened before removing the shoe to avoid breaking them or tearing out the eyelets. Forcing shoes off before loosening the laces also will wear out the back linings. Before setting them away for the night, shoes should be carefully examined for necessary repairs especially at the seams. Even though they will be worn again the next day, forms should be placed into the shoes overnight, preferably display forms, to help keep their shape (Fig. 268). Such a form will prevent them from curling and wrinkling, and will not shut off the free circulation of air

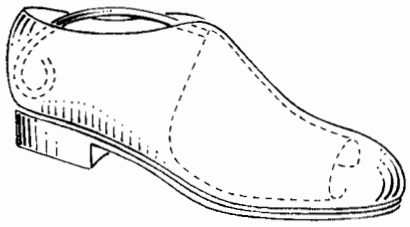


Fig. 268. Display form in shoe.

in the shoe. Shoes never should be set near heaters but be permitted to dry at normal temperatures. Shoes always should be put on with a shoehorn, and laces should be sufficiently loose, otherwise the counter may be broken down, the back seam ripped, and heel linings torn from the quarters. When shoes are put on, laces should be drawn up as carefully as they were loosened.

POLISHING SHOES

In order to keep a good finish, shoes should be polished at least once a week as a protection against the elements. Rain and dirt ruin both the wax and coloring matter. Before shoes are polished, they should be thoroughly washed with warm water and soap to remove the more or less absorbed or encrusted foreign matter. If dirt is not removed, it will be impossible to work in the wax contained in the polish.

Before polishing, the shoes should be rubbed briskly with the back of the polishing cloth to warm them and to remove the dirt and dust particles. If these dust particles are not removed from the pores, they will show through the thin veneer of polish and give the shoe a faded appearance. Shoe polishing means a great deal more than merely smearing on a lot of polish and rubbing it down. First of all, it is necessary to select a good polish, that is, not one that will react quickly to a few strokes with a polishing cloth, but a hard-finish polish that requires brisk rubbing to bring it to a luster. This rubbing will leave no polish on the surface of the leather to gather dust or dirt.

If polish is applied with a rag or dauber, more remains on the shoe than is necessary to renew the finish or that can be worked up. This will only gum up the polishing cloth and leave a certain amount of polish on the surface to become a dust and dirt collector and destroy the possibility of a lasting shine.

Polish should be applied with the fingers by first running the fingers lightly over the polish and then over the surface of the shoe. It should then be worked in briskly with a polishing cloth until the desired luster

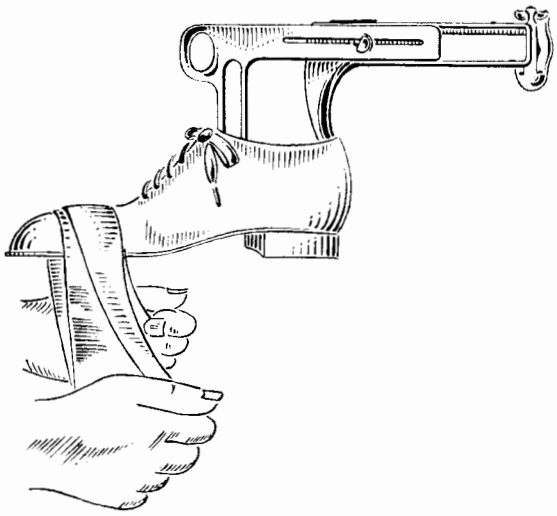


Fig. 269. Polishing shoes.

has been obtained. This will produce a dry, hard-finished shine that will last for some time and can be renewed by merely wiping the shoe with a cloth.

A good polishing job should restore the new-shoe appearance. Therefore, the appearance of the welt and edges of the soles cannot be overlooked. They should be treated in the same manner as the rest of the shoe, or they should be given a coat of sole and heel dressing.

DYEING

There are many methods of coloring and many more of staining and finishing leather. Though there are significant differences among these methods, the indiscriminate use of the term dyeing has made it almost impossible for the public to differentiate between them. The repairman, however, must acquaint himself with each of the products by experimenting with them on the numerous types of leathers, so that he may speak with authority when advising customers and thus maintain their confidence.

To get a permanent and uniform color the leather should be dyed. Dyes do not merely cover the surface but penetrate sufficiently to color the fibers that constitute the leather. To give depth to the color and prevent fading and crocking, the leather should be properly cleaned of all extraneous matter including the original finish. Some finishes can be dissolved with water and a mild detergent while most can be dissolved

with denatured alcohol and scoured with very fine steel wool or a stiff fiber brush. After the removal of the original finish, a fast color dye job can be assured with the use of a mordant which creates an affinity between the dye and the leather. After once more checking to see that no areas or spots have been overlooked, apply the dye with a wool dauber or camel's hair brush. This original or primer coat of dye should be permitted to dry. After this it should be rubbed briskly to remove any dye concentration, resulting from irregular or streaky application. The second coat also should be rubbed briskly. This should be done before the dye is completely dry, not only to insure uniformity, but to guard against any residue remaining on the surface which would create a condition that is often mistaken for crocking.

The final step is to apply a good hard wax-base polish in the manner described under polishing shoes. *Shoes never should be dyed while on the feet, nor should they be worn until several hours after dyeing.*

Do not attempt to dye a dark shoe lighter. This can only be accomplished by covering the old color by using a pigment-type finish. This method does not penetrate the fibers but adheres to the surface and, therefore, should be classed as a recoloring job rather than a dye job. There are many varieties of recoloring agents on the market each made with different ingredients, some of which cannot withstand the constant flexing of normal usage. It, therefore, behooves the repairman and the bootblack to acquaint himself with the capabilities of the various brands available to his customers.

Recoloring is accomplished in steps similar to those followed in dyeing. In recoloring, it is particularly important to remove the glaze (glossy finish) put on by the tannery. This glossy protective coating would prevent the new color from adhering properly. Follow the directions of the manufacturer as to the number of coats. Good judgment, however, should be used since the customer will judge only the quality and durability of the final appearance.

OILING SHOES

More shoes are ruined by continuous wetting than in any other way because this continuous moisture washes out the natural oils so necessary to the life and flexibility of the leather. If sufficient oil is not restored, the fibers of which the leather is composed will become brittle and break, thus ruining the leather.

Dress shoes should be rubbed down with a light coat of castor oil whenever they shown signs of excessive dryness. If shoes have been

thoroughly soaked, oil should be applied very lightly and should be rubbed in until all trace of it has been removed from the surface. They should then be set aside for about ten or twelve hours to permit the oil to penetrate the leather, after which they can be readily polished.

Shoes which do not require polishing, such as heavy work shoes and boots, should be thoroughly cleaned while still wet. If necessary, they should be washed with soap and water, and when they are partly dry, they should be rubbed with neat's-foot oil.

If the oiling is merely for the purpose of softening the shoe for summer wear or for outing purposes, a light coat of neat's-foot oil compound will be sufficient. For winter wear, however, the consistency of the oil should be more in the nature of grease, such as a mixture of petroleum jelly and paraffin wax.

Before oils or greases are applied, they should be warmed by setting the grease container in hot water so that they will flow and thus penetrate the leather quicker. *Oils and grease never should be warmed by setting them over or near an open flame.*

The most satisfactory way to waterproof soles is to set the shoes for ten to fifteen minutes in a shallow pan with enough oil barely to cover the soles. They should not be permitted to become soggy because nothing will be gained by it. The fibers in the leather are so compact that merely oiling the leather will make it water resistant.

CLEANING SUEDE

Cleaning and restoring suede leather shoes and accessories is not a problem, nor is it as difficult as it seems. A great deal depends upon the nature and type of materials used in preparing and cleaning the shoes. There are many excellent brands of dressings available. Have your findings dealer recommend a brand available in your territory.

A good job should have the following qualities:

1. It should not rub off and soil whatever it comes in contact with.
2. It should not run when it becomes wet.
3. It should be color fast and not fade in direct sunlight.
4. It should not be streaked.
5. It should not penetrate through to the lining.
6. The nap should have a rich, fluffy appearance.

Remove all extraneous matter by thoroughly brushing the suede. Do not use force to remove spots and encrusted matter, for in so doing you may also remove the nap.

Do not saturate the spot with strong solvents, lest you create a ring, by displacing coloring matter. Rub the spot briskly, applying a pure white soap with a slightly dampened sponge or clean white cloth. Should bald spots be encountered, create a new nap, by working up the fibers with a piece of medium coarse sandpaper.

Apply a liberal coat of dressing and brush up the nap while it still contains a trace of moisture.

REVIEW QUESTIONS

Daily Care

1. In addition to fit and appearance of a shoe, what is considered very important by a shoe manufacturer?
2. Aside from hard wear, what else must a shoe be able to withstand?
3. What should be done to a shoe that has been worn all day?
4. What will happen if shoes are forced off without opening the laces?
5. How should shoes be dried?
6. How should shoes be put on?

Polishing Shoes

7. How often should shoes be polished? Why?
8. Before polishing, what should be done?
9. What kind of polish should be used?
10. How should polish be applied?

Dyeing Shoes

11. Why is redyeing difficult?
12. What should be done to the old finish before redyeing?
13. How should dye be applied?
14. How long after shoes have been dyed may they be worn?

Oiling Shoes

15. Why does continuous wetting ruin shoes?
16. How can oil be restored to leather?
17. How long does it take for oil to penetrate leather?
18. How should heavy work shoes and boots be cleaned?
19. What is used to oil shoes for summer wear and winter wear?
20. How should oils and greases be warmed? How not?
21. What is the most satisfactory way of oiling shoes?

Cleaning Suede

22. What are the requirements of a good suede cleaner?
23. What are the first steps in cleaning suede? Why?
24. Can badly scuffed spots be remedied? How?

GENERAL QUESTIONS

1. Discuss: "It pays to tell customers how to care for shoes?"
2. Which aspect of shoe care is most important? Why?
3. How do you account for the fact that shoes are not given better care?

CHAPTER 13

Operations and Maintenance of Shoe Machinery

GENERAL OPERATION

The old cobbler at his bench with awl, needle and thread was required to do many painstaking and slow jobs by hand which today are accomplished quickly and accurately by machine. A number of different kinds of machines are available, from buffing and polishing wheels to stitchers. As with all electrical equipment, close reading of manufacturers'

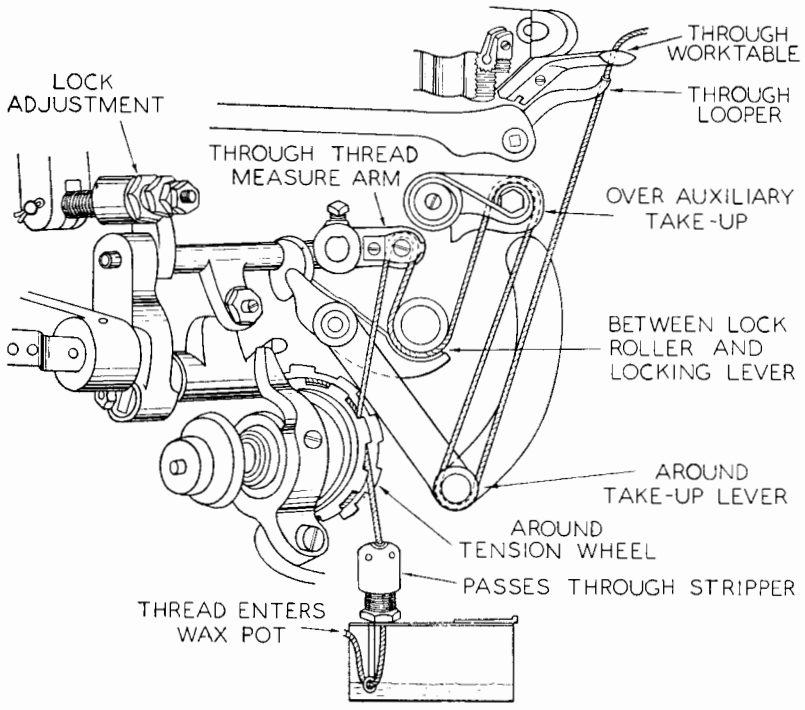


Fig. 270. Curved-needle stitcher. Threading the machine.

directions and common-sense application of the principles of safety and preventive maintenance will in the long run save time and money.

CURVED-NEEDLE STITCHER

Oil well in the morning; clean well in the evening.

Anyone who is interested in learning shoe repairing must also learn how to operate the curved-needle machine, by means of which soles are stitched to the shoe (Fig. 270). Many new workers approach this machine with fear, which, however, is uncalled for, because it is simple to operate. All that is required of the operator is the steering of the shoe. The beginner should place a shoe in position in the machine as though he were getting ready to sew. The shoes should be left in this position and the operator should view it from a short distance. This will give a good perspective of how little he is required to do. The machine not only holds the shoe, it does everything but turn the shoe.

The machine is operated as follows:

1. Before placing the shoe in position, turn the handwheel until the *take-up lever* (Fig. 271) reaches the top of the stroke. At this point

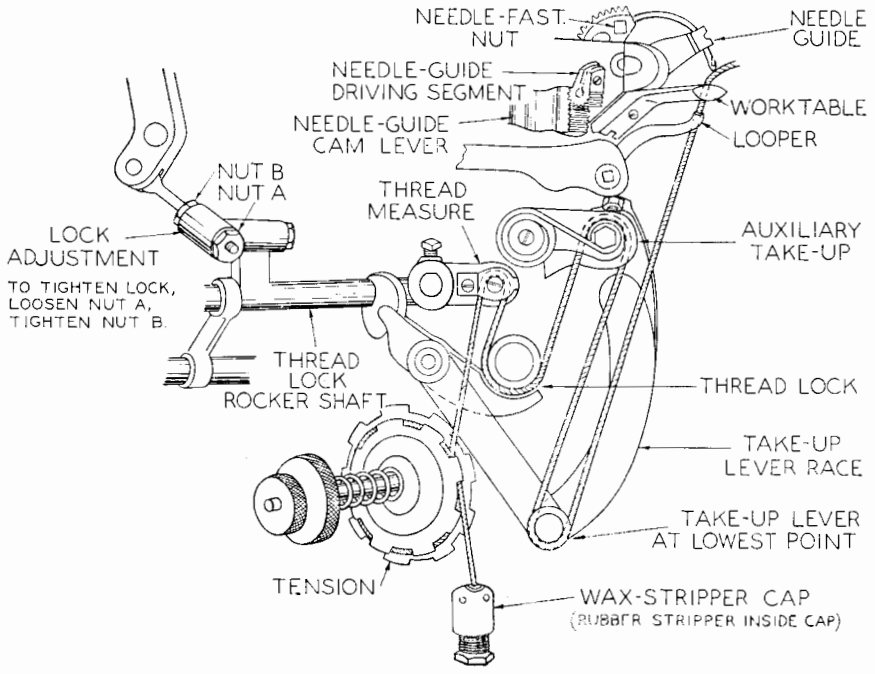


Fig. 271. Parts, locations, and duties of curved-needle stitcher.

the thread lock is open. Pull out sufficient thread, and turn the hand wheel until the take-up lever reaches the lowest point of the stroke. This will prevent snapping the thread when starting.

2. Grasp the shoe around the instep with the left hand, drawing the uppers away from the welt. This will prevent pinching the uppers between the welt and the worktable (*C*, Fig. 272).
3. With the right hand, press levers *A* and *B*, Figure 272, together. This will raise presser foot *D*.
4. Holding the shoe bottom side up, place it in position so that the welt rests on the worktable (*C*, Fig. 272). Release the levers held with the right hand, grasping the shoe around the toe. Keep the left hand in its original position or grasp the shoe around the heel — whichever gives the greater confidence.
5. Do not speed around the toe until you have mastered the technique because you may run off the edge of the shoe.
6. When you near the toe, release the pressure on the foot pedal, thus slowing down the machine.

Before beginning work on another shoe, always pull out sufficient fresh thread, because the wax cools rapidly and the thread becomes stiff.

CAUTION: Hold the shoe lightly, and do not attempt to aid the machine by pulling or pushing the shoe. You will accomplish nothing thereby but you may break or bend an awl or needle.

Do not attempt to straighten a bent awl or needle but replace it with a new one.

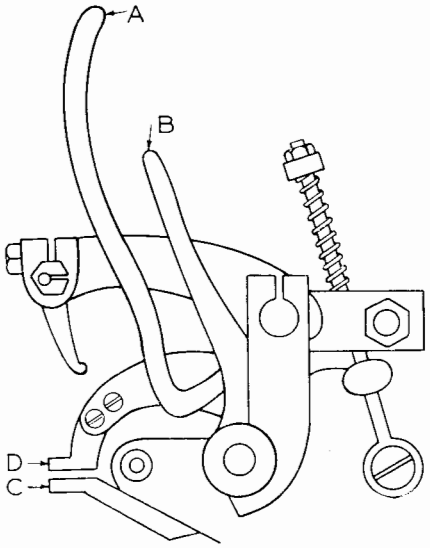


Fig. 272. Raising the presser foot.

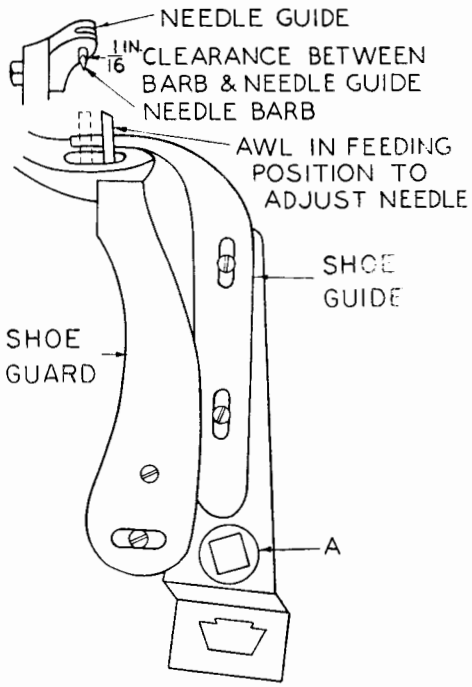


Fig. 273. Setting the needle.

1. To release the needle, turn the handwheel until the needle-fastening nut, Figure 271, is visible immediately behind the bobbin case (Fig. 281).
2. Loosen the nut and slide the needle downward and out of the needle guide (Fig. 273).

To replace the needle, reverse the operation, first checking the needle guide for wear. A worn needle guide will cause the needle to break.

To replace the awl, loosen nut *A*, Figure 273, and flip the shoe guide and guard to the right thus permitting free access to the awl-fastening screw.

Aside from keeping the entire machine well oiled and clean, minor adjustments occasionally are required. Should difficulties arise, in most instances they can be quickly traced down and adjusted by checking through the following information.

TROUBLE CHART

Needle.

1. Turn the handwheel until the awl has reached its highest upward stroke, which is just before it starts to move to the left (Fig. 273).

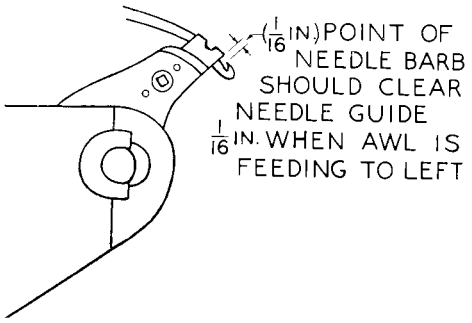


Fig. 274. Setting the awl. See Fig. 275.

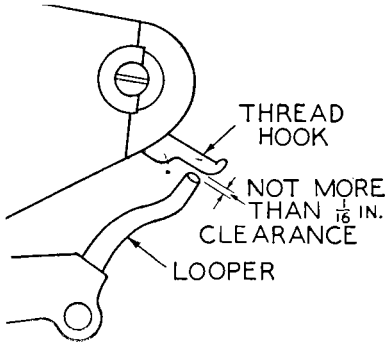


Fig. 276. Setting the looper.

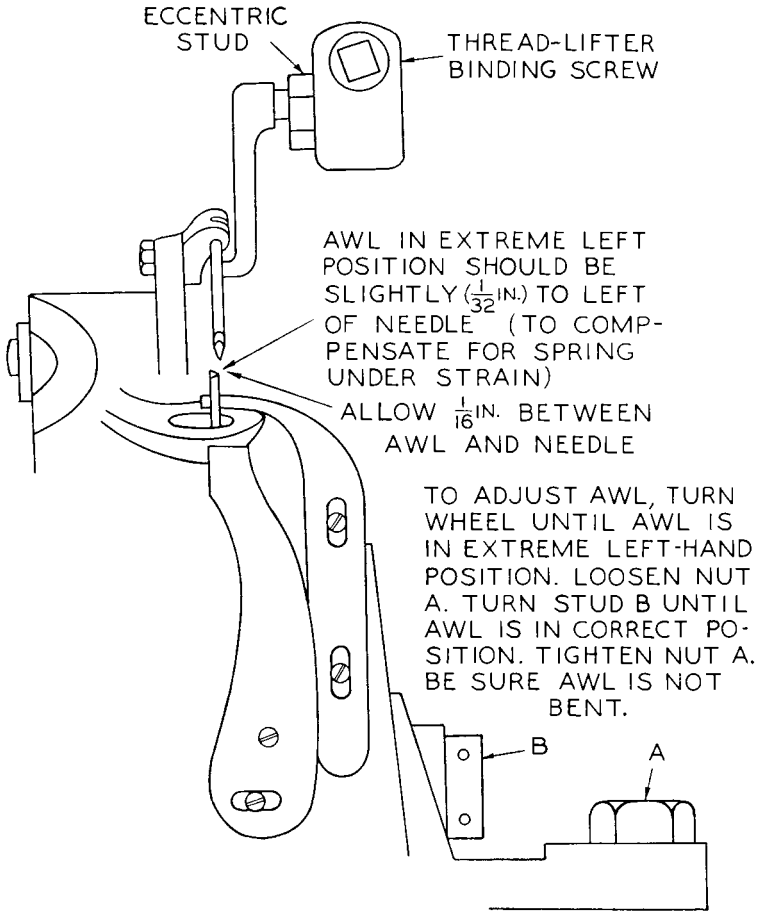


Fig. 275. Adjusting the awl.

2. Set the needle so that there is a 1/16-in. space between the needle barb and the needle guide (Fig. 273).

Be sure that the needle and the needle guide are the same size. Should there be excessive play, it is an indication that the needle guide is worn and needs replacing.

Awl.

1. The awl should be set so that it is 1/16 in. below the needle on the downstroke.
2. Check the awl for the correct position.
3. Turn the handwheel until the awl reaches its extreme left-hand position, just before it starts its downward stroke. At this point the awl should be 1/32 in. to the left of the needle.
4. To adjust it to that position, loosen nut *A*, Figure 275, and turn stud *B* until the awl is in correct position. Then tighten nut *A*.

   CAUTION: Before undertaking this adjustment, be sure the awl is not bent.

Looper.

1. Set the looper so that it will clear the thread hook not more than 1/16 in., but be sure it does not pinch the thread (Fig. 276).
2. Turn the handwheel until the looper carries the thread to the needle.
3. Adjust the looper so that it lays the thread in the needle 1/16 in. above the needle barb (Figs. 277 and 278).

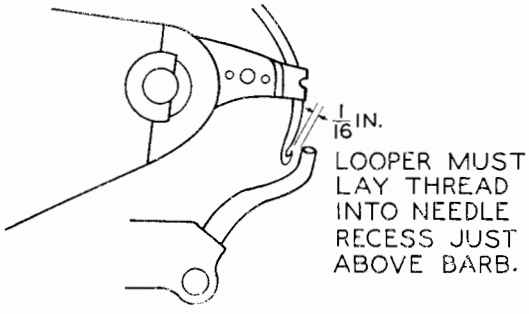


Fig. 277. Adjusting the looper — side view.

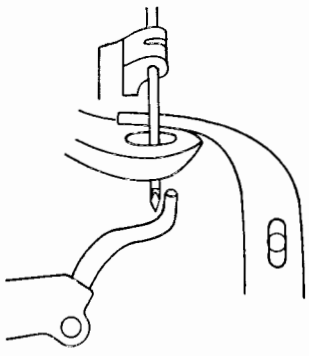


Fig. 278. Adjusting the looper — front view.

Thread Lifter.

1. Set the thread lifter so that the needle point just clears when rising with the thread (Fig. 279).
2. Make adjustment so that the needle point and the lip of the thread lifter are perfectly in line. This is important because the thread lifter

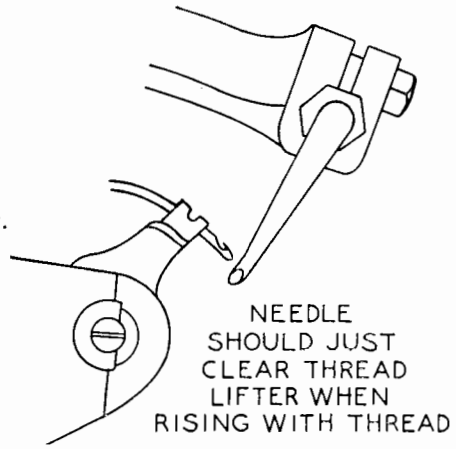


Fig. 279. Setting the thread lifter.

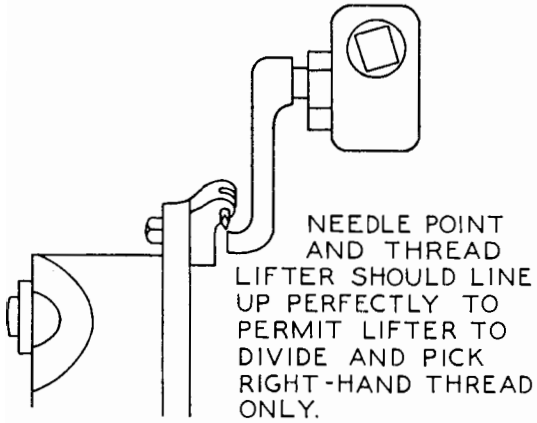


Fig. 280. Adjusting the thread lifter.

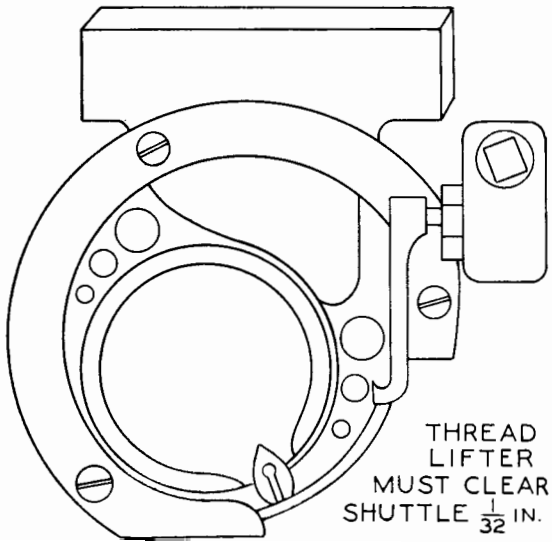


Fig. 281. Thread lifter shuttle clearance.

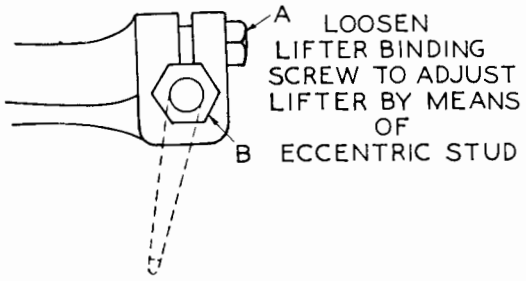


Fig. 282. Loosening the thread lifter binding screw.

must separate the thread so that it picks up only the right-hand thread (Figs. 280 and 290). The thread lifter should clear the shuttle 1/32 in. when rising (Fig. 281).

3. To adjust the thread lifter to any position, loosen nut A, Figure 282, and turn the eccentric stud *B* until the desired position has been reached.

Thread Lock.

1. Turn the handwheel until the take-up lever is at its lowest point (Fig. 271).
2. Pull up on the thread. If you can pull out the thread when the machine is in this position the thread lock is not holding.
3. To adjust, see the extreme left hand of Figure 271. Loosen nut *A*, and tighten up on nut *B*, until the proper adjustment has been made. Use caution or you may pinch the thread or jam the machine. In either case, reverse the procedure. (For another model, see Fig. 270).

Tension. To avoid an uneven lock and unnecessary ripping, the tension should be checked frequently. Tension changes will vary because of a number of factors, one of which is excess wax which may be drawn from the wax pot and be deposited on the various working parts, especially on the thread rolls.

1. Should wax be drawn up, screw down the stripper cap shown at the bottom of Figure 271.
2. If this does not correct the trouble, remove the stripper cap and replace the rubber stripper, which should be done frequently.
3. Before adjusting the tension, clean all thread rolls and especially the tension wheel.
4. Do not adjust the tension too tight as this may cause thread breakage.

Thread Measure. This mechanism (Fig. 271) is set at the factory to measure out the thread automatically for the different weights of soles. It seldom gets out of adjustment and should, therefore, not be tampered with unless *proven* to be at fault. Should adjustments become necessary,

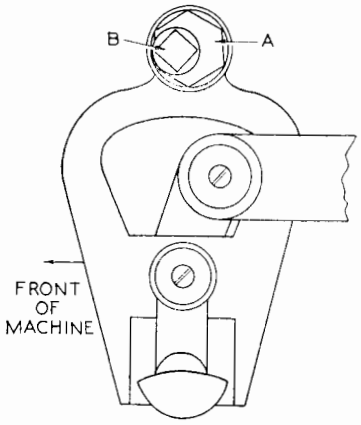


Fig. 283. Adjusting mechanism.

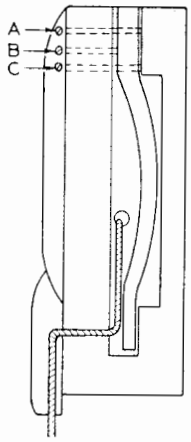


Fig. 284. Adjusting bobbin tension.

however, locate the adjusting mechanism on the right-hand side of the machine (Fig. 283). Loosen nut *B*, and turn the eccentric stud *A* up to make the lock deeper, or down to make it shallow. Be sure that the eccentric stud does not turn while tightening the locking nut *B*.

Bobbin. To insure satisfactory results bobbin care is essential. The tension should be kept in harmony with the tension on the bottom thread.

1. To adjust the tension on the bobbin shown in Figure 284, see that screw *A* is tight. This screw holds the spring in place.
2. To increase the tension, loosen screw *B* and tighten screw *C*.
3. To decrease tension, loosen screw *C* and tighten screw *B*.

Auxiliary Take-Up.

1. Turn the handwheel until the looper carries the thread around the

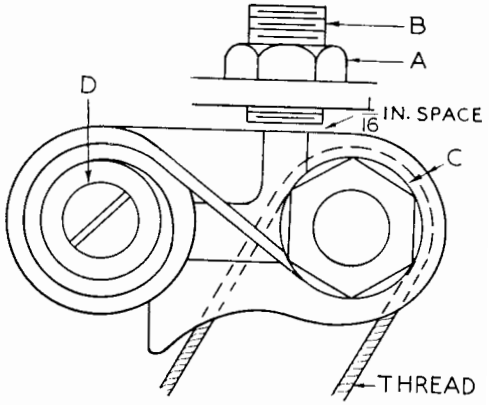


Fig. 285. Adjusting the auxiliary take-up lever.

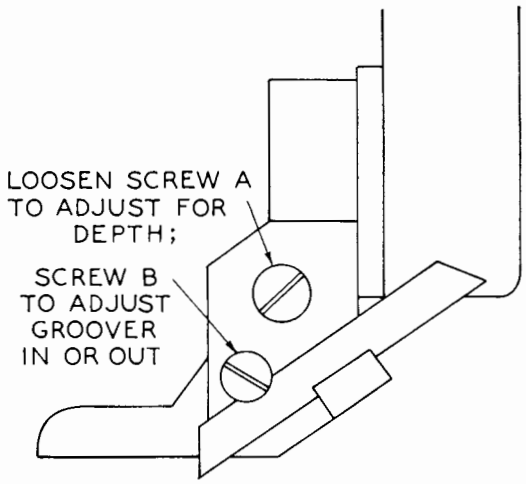


Fig. 286. Adjusting the presser-foot groover.

needle (Fig. 278). At this point the take-up lever should be 1/16 in. from screw *B*, Figure 285.

2. To adjust, loosen nut *A*, and adjust screw *B* to the desired height.
3. At rest position, the take-up lever should rest against the stop screw. If it does not, loosen screw *D*, compress spring *C*, and tighten screw *D*.

Groover. To adjust the presser-foot groover, see Figure 286.

1. For depth, loosen screw *A* and set the groover to the desired depth.
2. To line up the groover with the awl and the needle, turn screw *B* to the correct position.

REPLENISHING THREAD

To replenish the thread, it is not necessary to rethread the machine. When almost out of thread, tie the new spool to the old, just before it enters the wax pot. To insure against the knot becoming untied when pulling it through the stripper (Fig. 288), use a square knot in joining the two threads (Fig. 287). Turn the handwheel until the take-up lever reaches the

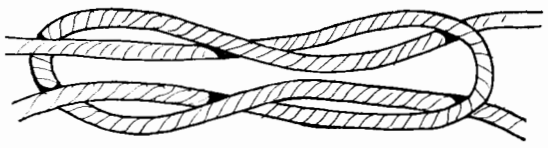


Fig. 287. A square knot.

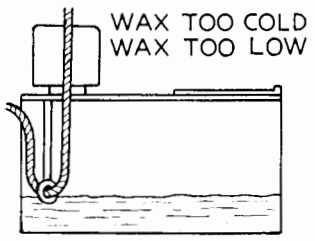


Fig. 288. The stripper.

top of the stroke. At this point the thread lock is open. Pull the knot up through the machine. Should you have trouble getting it through the stripper rubber, loosen the stripper cap (Fig. 288), pull the thread through, and again tighten down the stripper cap (see Fig. 270).

CAUSES OF BROKEN OR STRANDED THREAD

1. Needle is imperfectly set.
2. There may be an accumulation of wax between the bobbin case and the bobbin-case retainer.
3. Machine is not up to proper heat (Fig. 288).
4. Thread has insufficient wax (Figs. 288 and 293).
5. Bobbin thread may be dried out (Fig. 289).
6. Thread is too heavy for the needle (Fig. 290).
7. The thread lifter may not be in line with the needle (Fig. 291).
8. Looper may be improperly set (Figs. 277 and 278).
9. Thread rolls may be stuck (Fig. 292).
10. The auxiliary take-up may not be functioning (Fig. 285).
11. Thread hook may fail to release the thread (Fig. 276).
12. The lock may be too tight (Fig. 271).

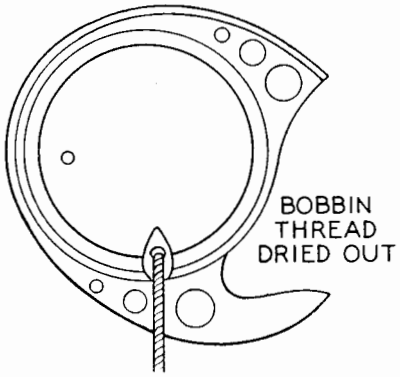


Fig. 289. Bobbin.

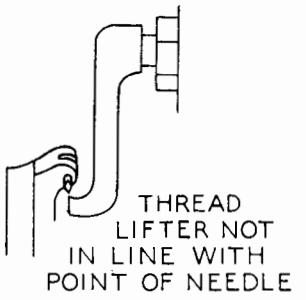


Fig. 291. Lifter and needle.

Fig. 290. Needle.

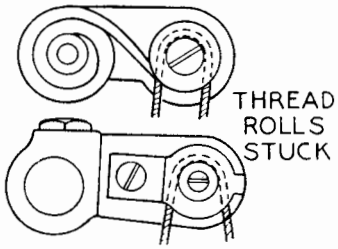


Fig. 292. Thread rolls.

Fig. 293. Work table and looper.

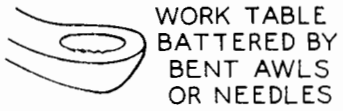


Fig. 294. Work table.

CAUSES OF BROKEN NEEDLES

1. Needle and awl may be out of line (Fig. 275).
2. Awl or needle may be bent.
3. Needle guide may be worn or loose (Fig. 274).
4. The shoe may have been crowded while sewing.
5. Thread may be too heavy (see "Thread and Needle-Size Table," below).

The following table gives the recommended sizes of top and bobbin threads in the number of cords for each together with the number of stitches per inch for the several needles listed, and the correct size of awl and needle guide for each.

THREAD AND NEEDLE SIZES

NEEDLE	AWL	NEEDLE GUIDE	TOP THREAD (CORDS)	BOBBIN THREAD (CORDS)	STITCHES PER IN.
20	20	20	5	4	14
21	21	21	6	5	12
22	22	22	7	6	10
23	23	23	8	7	7 to 9
24	24	24	9	8	4 to 6
45	43	45	9	8	4 to 6
47	45	47	8	7	7 to 9
50	47	50	7	6	10
52	50	52	6	5	12
54	52	54	5	4	14

STRAIGHT-NEEDLE STITCHER

General Operation

The straight-needle stitcher is used to sew untrimmed soles with the welt side up. The operation of this machine is very simple.

1. Grasp the shoe over the instep and pull the uppers away from the welt.
2. If the arch has a decided bend, tilt the toe upward when sewing in the shank. This will enable the machine to travel a level surface.
3. When the ball of the foot has been reached, hold the shoe level until

you get to the opposite side of the shank. Always hold the shoe at an even keel and do not tilt it sideways.

4. If the welt is very narrow, first press it down from the overlapping insole. The work can be simplified also by holding the uppers firmly away from the welt while sewing.
5. Do not crowd the presser foot more than necessary, and keep your stitches as close to the edge of the welt as safety will permit.

Do not become overanxious and crowd the shoe thus turning out work that will not wear well.

Threading. For the top thread use a left-hand twist or braided thread, and for the bobbin use a right-hand twist.

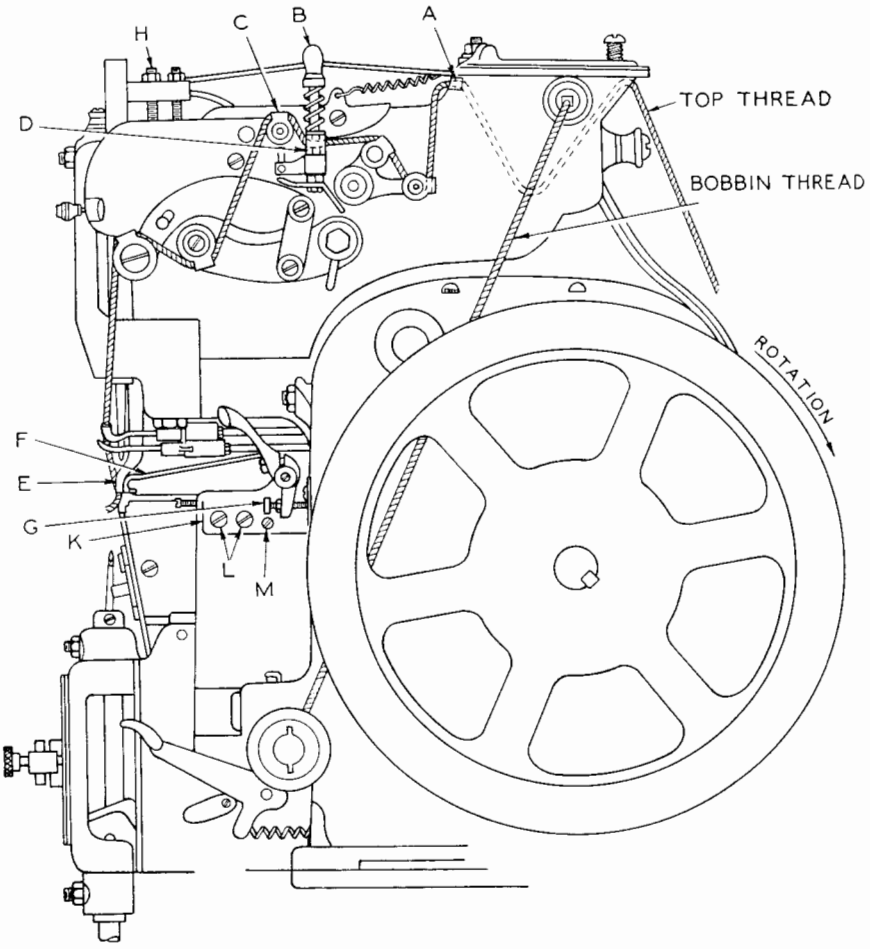


Fig. 295. Straight-needle stitcher.

1. Feed the top thread through a small hole in the rear of the wax pot, through the thread arm at the bottom center of the wax pot, and out through the stripper rubber, *A*, Figure 295.
2. Then pass the thread through the thread-measure rollers and through lock *D*.
3. To thread the lock, turn the handwheel until the lock is open. If a greater opening is necessary, loosen thumb screw *B*. This will not be necessary, however, if a threading wire is used. Thread can also be easily pulled through the lock with a needle by hooking the thread into the barb of the needle.
4. Continue the thread through the auxiliary take-up roller *C*, Figure 295, through the bottom take-up lever, and then through the top take-up lever, eye-thread thrower, and presser foot.

Setting Awl and Needle. When replacing the awl or needle, do not loosen the fastening screws more than necessary. If the screws are loosened too much they will stick in the awl or needle-bar race and jam the machine. When correctly set, they should *almost meet* on the upstroke (Fig. 296). Should they *meet*, remove the needle and check for dirt or a broken needle butt in the needle bar. Clean out the needle recess using the extra hole just below the needle-fastening screw (*A*, Fig. 296).

The needle barb should be squarely to the right when viewed from the front of the machine, as shown in Figure 296.

The flat side of the awl should face directly toward the front of the

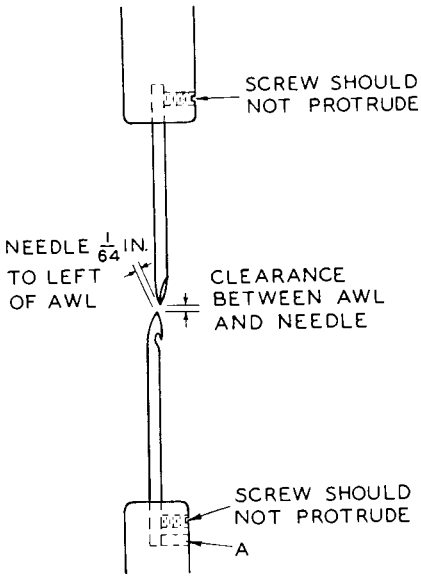


Fig. 296. Setting the awl and needle.

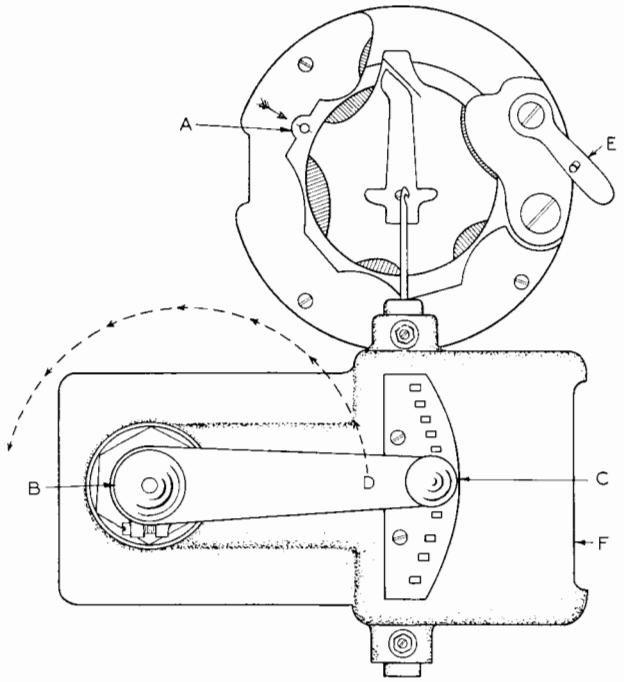


Fig. 297. Removing the bobbin case.

machine. (Before operating the machine, be sure the awl and needle-fastening screws do not protrude.)

The needle should be set 1/64 in. to the left of the awl, as shown in Figure 296. To make an adjustment when the needle is not in correct position, loosen nut *B*, Figure 297, and tap slide *F*, Figure 297, until the needle is in proper position; then tighten nut *B*.

Before beginning this complete checkup, be sure that the awl and needle are not bent.

To Remove Bobbin Case.

1. Turn the handwheel so that, with the needle in the *down* position, the arrow on the shuttle retainer is in line with the line on the shuttle, *A*, Figure 297.
2. Pull out knobs *B* and *C*.
3. Throw the hand lever *D* over to the opposite position, as shown in Figure 297.
4. Raise the latch lever *E*, and remove the shuttle.

Eye Thread Thrower. The eye thread thrower should clear the needle 1/16 in. when passing in front of it (Fig. 298).

The bottom of the eye thread thrower should be 1/32 in. below the needle barb (Fig. 299).

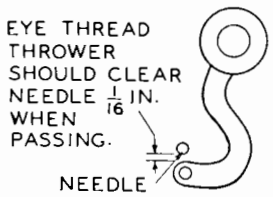


Fig. 298. Eye thread thrower.

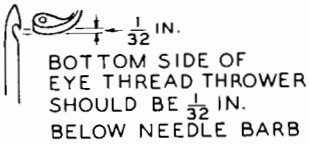


Fig. 299. Eye thread thrower and needle barb.

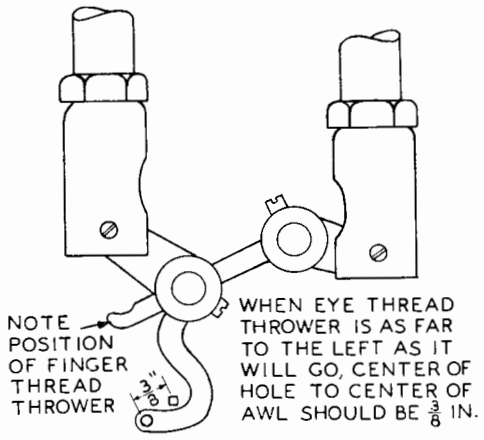


Fig. 300. Finger thread thrower.

When the eye thread thrower is as far to the left as it will go, the center of the thread hole should be ⅜ in. from the center of the awl (Fig. 292).

Finger Thread Thrower. The finger thread thrower should be set so that an ordinary business card can be passed between it and the eye thread thrower, which is about 1/64 in. When the finger thread thrower is as far to the left as it will go, it should be in the position shown in Figure 300, that is, it should extend under the center of the eye thread thrower crank.

NOTE: When either the eye or the finger thread thrower is out of line in the up or down position, it is either bent or the needle is not seated properly. To make an adjustment, clean out hole *A*, Figure 296, and force the needle down as far as it will go. If the thread throwers still are out of line, bend them into position, as shown in Figure 299 so that both thread throwers almost touch in passing, with the bottom of the eye thread thrower in position as shown in Figure 299.

Auxiliary Take-Up. Although this part rarely needs adjusting, it will be well to check it occasionally. It should, at all times, be kept free of wax and well oiled. It should always operate freely since it takes up the slack thread when the throwers lay the thread into the barb of the needle (Fig. 301).

Adjusting the Channel Cutter. The channel cutter should be set 1/32 in. from the needle and slightly to the rear of the center of the needle. The point of the channel cutter should line up between the center and the back of the needle *D*, Figure 302.

1. To line up the channel cutter with the needle, loosen screw *E*, Figure

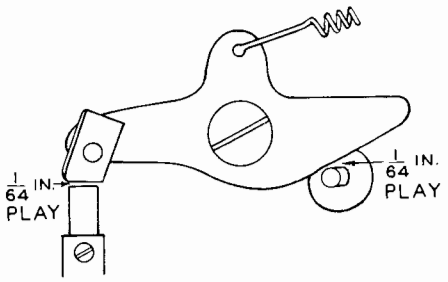


Fig. 301. Adjusting the auxiliary take-up.

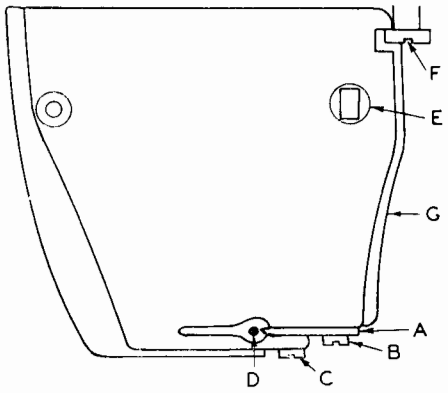


Fig. 302. Adjusting the channel cutter

302, and adjust it with screw *F*. Be sure to tighten the channel cutter again with screw *E*.

2. To deepen the channel, tighten screw *C*. Turning the tapered screw clockwise raises the cutting blade.
3. To make the channel shallow, turn screw *C* to the left, thereby lowering the cutting edge.
4. To sew without the channel, loosen screw *B* and flip the channel cutter, *A*, to the right.

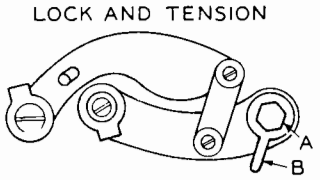


Fig. 303. Setting the lock.

5. To remove the channel cutter, remove screw *B*, and lift out the cutter.

Lock and Tension. The lock should be set to pull to the center of the outer sole. Before making any adjustments, check the tension, thread rolls, and strippers to see that they are clean and work freely.

1. To set the lock deeper, loosen nut *A*, Figure 303, and move pin *B* forward, to the left.
2. To make the lock shallow, move the pin to the rear to the right, and tighten screw *A*.
3. Should the thread pull through with the lock closed, check for obstructions or worn places on the anvil block, *D*, Figure 295.
4. Should the thread have worn a groove in the anvil block, adjust it by giving the anvil block a quarter turn.

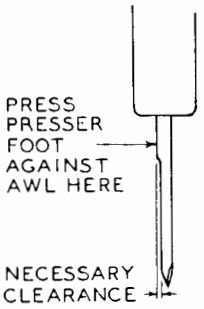


Fig. 304. Setting the presser foot.

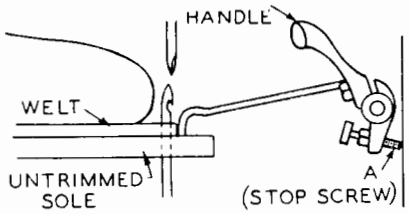


Fig. 305. Work gauge position.

Fig. 306. Loop opener.

Presser Foot.

1. To set the presser foot correctly (*E*, Fig. 295), bring the awl down as far as it will go.
2. Raise the presser foot to the very top of the awl. Be sure not to bend the work gauge *F*, Figure 295.
3. Push the presser foot back against the top of the awl (Fig. 304). Since the awl is heavier at the shank, this will give the necessary sewing clearance.
4. The best operating height of the presser foot is when it is set ⅛ in. above the needle plate. When it is necessary to adjust it to this position, bring the work gauge, *F*, Figure 295, back up against the stop screw, *G*, Figure 295, and make up or down adjustments at *H*, Figure 295.

Work Gauge. The correct position of the work gauge is shown in Figure 305. The gauge should rest on the newly attached sole so that it rests against the edge of the welt.

The stop screw, *A*, need not be changed unless the gauge has been bent by lifting the presser foot too high.

Loop Opener and Thread Hook. When the needle carries the thread to the loop opener, the point of the needle should almost touch the point of the loop opener. The point of the needle and the edge of the loop opener should line up perfectly.

1. When the point of the needle and the edge of the loop opener are not in line, set the stitch regulating arm, *D*, Figure 297, at 12 stitches per inch. This is the top hole on the stitch indicator.
2. Turn the handwheel until the needle just begins to pass under the loop opener.
3. Remove the cover plate (*K*, Fig. 295).

4. Loosen screw *L*, Figure 295, and adjust the loop opener.
5. Loosen screw *M*, Figure 295, and set the thread hook so that it is in the center of the loop opener.
6. Tighten all screws and replace the cover plate.

CAUTION: Before making adjustments, be sure the needle is not bent.

RULES TO OBSERVE

1. Keep the machine clean and well oiled.
2. Change the wax strippers periodically.
3. See that the bobbin thread pulls freely.
4. Use the correct length of stitch for different types of shoes and material.
5. When making short stitches, be sure to use a fine awl and needle.
6. Do not push or hold back on the shoe. The machine will perform much better if you do not force it, and fewer awls and needles will be broken.
7. Always pull out fresh thread when you begin to sew.

CAUSES OF BROKEN NEEDLES

1. Awl and needle do not line up correctly.
2. Awl is bent or blunted.
3. The shoe is pushed or pulled while being sewed.
4. Loop opener is out of adjustment.
5. The presser foot is crowded into the path of the awl.
6. Size of the needle is too large for the awl.
7. The thread is too heavy for the size of the needle.
8. Needle and awl are too light for heavy work.
9. The shoe is tilted and not held at an even keel.
10. The shoe is not set properly at the beginning.

CAUSES OF BROKEN THREAD

1. Thread is not properly waxed.
2. Bobbin thread is dried out because it is too old.
3. Lock is set too deep.
4. Rollers are gummed up and sticky.
5. Stripper rubbers are too tight.
6. Needle is bent.
7. Loop opener is not in line with the needle.
8. Thread hook is worn, therefore not releasing the thread.
9. Rough or worn places on loop opener or eye thread thrower.
10. Eye or finger thread thrower is out of adjustment.
11. Needle is improperly set.

12. Thread is not properly heated.
13. Insufficient fresh thread has been pulled out.
14. Not enough fresh thread has been measured out at the beginning.

The following table gives the recommended sizes of top and bobbin threads in the number of cords for each together with the correct awl and needle sizes for the straight-needle stitcher:

THREAD AND NEEDLE SIZES

NEEDLE AND AWL	TOP THREAD (CORDS)	BOBBIN THREAD (CORDS)
7	8	7
6	7	6
5	6	5

PATCHING MACHINE

General Operation

This machine differs considerably from the factory upper machine. It is so constructed that it will sew materials that cannot be laid out flat.

It also permits sewing in any desired direction without stopping or turning the material. This is accomplished by merely turning the feeder foot in the right direction. It permits sewing of assembled shoes or cylindrical articles such as patching elbows, etc.

Keep the machine clean and well oiled and it will require very little servicing.

Operating the Machine. Select the correct weight of thread and needle for the type of work to be stitched. Satisfactory work cannot be expected if the same weight of thread and needle is used for all types of work.

Setting the Needle.

1. After selecting the correct weight of needle (see table of sizes, p. 183), turn the handwheel until the needle reaches its highest point.
2. Loosen the lower screw on the needle bar (*A*, Fig. 307).
3. Place the needle in position, and push it up into the needle bar as far as it will go.
4. Position the needle so that the shortest groove on the needle is nearest the shuttle.
5. When changing needles from one size to another, it may frequently become necessary to adjust the needle in or out to avoid skipping stitches. To do this, loosen screw *B*, Figure 307 and shift the needle regulating clamp *C* as required.

Threading the Machine.

1. Place the spool on the spool pin so that the thread unwinds counterclockwise.

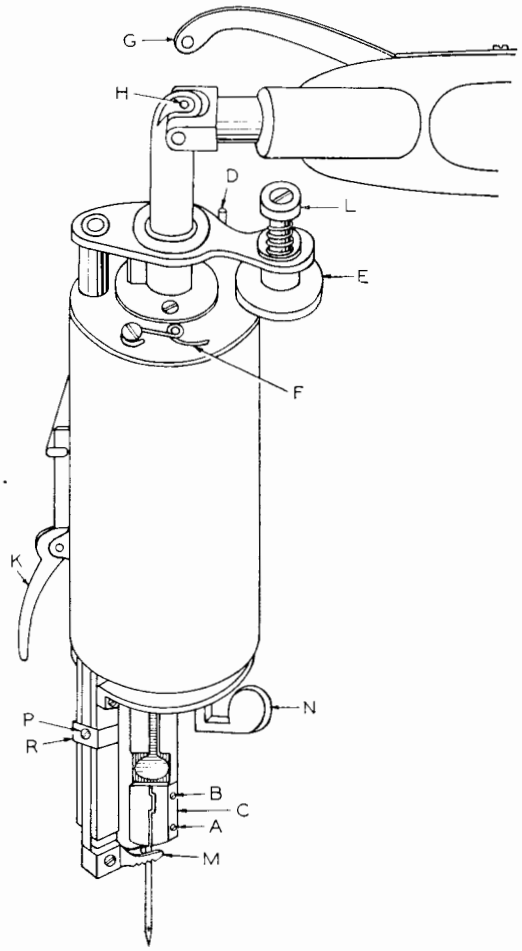


Fig. 307. Patching machine.

2. Pass the thread through under the oil-cup wire and on around the back of the pin, *D*, Figure 307.
3. Take the thread back between the tension disks, *E*, Figure 307, through the thread eyelet, *F*, and up through the hole in the take-up lever, *G*.
4. Pass the thread down through the needle bar, *H*, using the threading wire provided for this purpose.
5. Pass the thread through the needle from the left to the right.
6. For a cross stitch, set the cross-stitch mechanism in the in-use position (Fig. 308).

Threading the Shuttle.

1. To remove the shuttle, press the button, *A*, Figure 309. This lowers

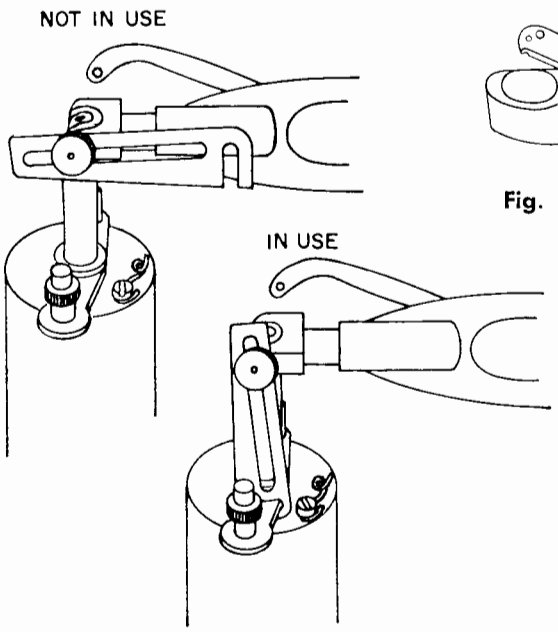


Fig. 308. The cross-stitch mechanism.

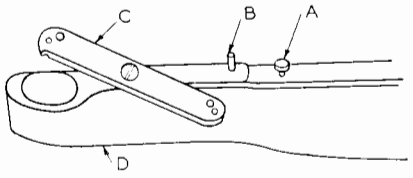


Fig. 309. Removing the shuttle.

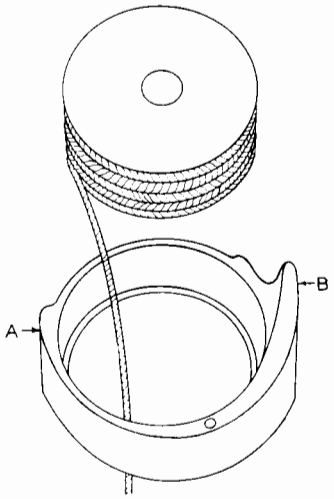


Fig. 310. Dropping the thread through the shuttle.

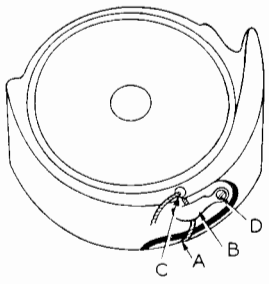


Fig. 311. Shuttle and bobbin.

locking pin, *B*, permitting the needle plate, *C*, to revolve. Do not loosen the needle-plate screw.

2. After replenishing the shuttle thread, take the shuttle in the left hand and the bobbin in the right hand. Permit the dangling end of the shuttle thread to drop through the shuttle, as shown in Figure 310.
3. Drop the bobbin into the shuttle, and bring the thread up through the slot in the bottom of the shuttle, as shown at *A*, Figure 311. In the same motion draw the thread up under the tension spring, *B*.

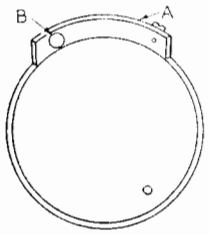


Fig. 312. Shuttle carrier.

4. Feed the thread through hole *C* so that it emerges from the top of the shuttle.
5. Grasp the shuttle with the left hand, with the forefinger at *A*, and the thumb at *B*, Figure 310.
6. Turn the handwheel until the shoulder of the shuttle carrier, *A*, Figure 312, is to your right. Then drop the shuttle into the carrier, and turn the needle plate into position.
7. Hold the end of the top thread with the left hand and turn the handwheel making a complete stitch. This will draw the shuttle thread up into position through the hole in the needle plate.

To Begin Sewing.

1. Place the material in position, and turn the handwheel so that the needle penetrates at a point where you will begin to sew.
2. Drop the presser foot by releasing lever *K*, Figure 307, and start the machine by turning the handwheel toward you, thus setting the machine in motion in the right direction.

Tension. Keep the upper and lower tensions regulated so that the bottom thread does not show on top or the top thread on the bottom.

1. To regulate the top thread, turn thumb nut *L*, Figure 307, to the right (clockwise) to tighten, and to the left to loosen.
2. Regulate the shuttle thread by tightening or loosening screw *D*, Figure 311.

   CAUTION: When tightening the shuttle thread be sure that it will pull freely.

To Change Direction of Sewing. This machine can be made to sew in any desired direction without turning the material or stopping the machine. The machine will travel in whatever direction the feeder foot, *M*, Figure 307, points. To change direction, merely turn handle *N*.

Regulating Length of Stitch.

1. To regulate the length of the stitch, loosen screw *P*, Figure 307, and drop the regulator band, *R*, down to make the stitch longer.
2. To shorten the stitch, move the band upward, and be sure to tighten the screw again.

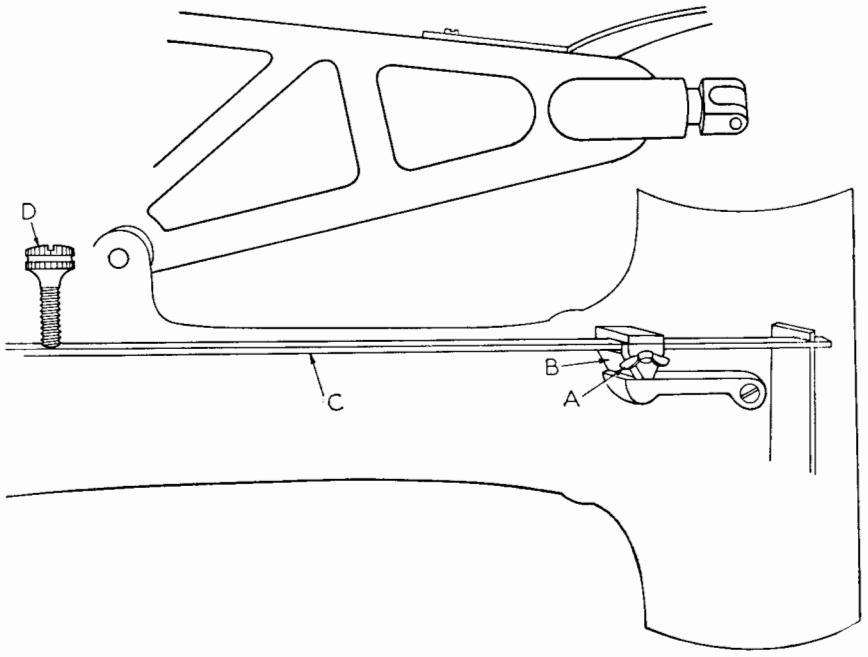


Fig. 313. Adjusting the presser foot height.

Height of Presser Foot (Feeder Foot). The presser-foot height should be regulated in accordance with the weight of the material being stitched. The presser foot should be so set that it clears the heaviest part of the work.

To adjust the range of the lift, loosen the wing nut, *A*, Figure 313, and slide block *B*, Figure 313, toward the handwheel to raise the lift. Move the block in the opposite direction to lower the lift.

Presser-Foot Pressure. The presser foot should exert only enough pressure to enable it to move the material. The pressure should be governed by the type of material being stitched. Fabrics (cloth) require less pressure than leather. The pressure is delivered by the spring, *C*, Figure 313, and can be regulated by adjusting thumb screw, *D*.

Timing the Machine. Should it become necessary to replace parts in the arm of the machine (*D*, Fig. 309), you can easily get the machine out of time. This should not cause alarm, however, since adjusting the timing is a simple operation.

Upon removing the cover plate at the bottom of the arm, *D*, Figure 309, two types of pinions can be seen (Figs. 314 and 315). Since pinion *A*, Figure 314, is merely a following pinion, its position need not cause any

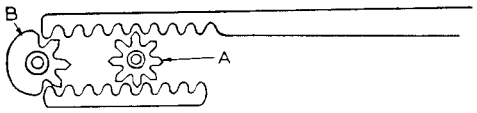


Fig. 314. Three-tooth driving pinion.

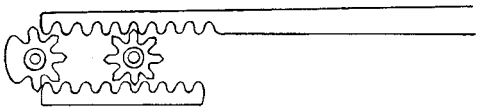


Fig. 315. Five-tooth driving pinion.

concern. Pinion *B*, however, is the shuttle-carrier driving pinion and must be correctly set to time the machine.

In Figures 314 and 315, two types of driving pinions are shown, one with three teeth, the other with five. Set the mesh for the three-tooth type.

Skipping Stitches. A machine frequently skips stitches because a change has been made from a heavy to a light needle without also changing the setting of the needle-regulating clamp, *C*, Figure 307. (See "Setting the Needle," p. 178). If adjustment of this regulating clamp does not remedy the trouble, check the shuttle-carrier spring, *B*, Figure 312; also check the point of the shuttle for wear.

The following table gives the recommended needle and thread sizes for the patching machine to be used on both leather and cloth. The needle to be used on leather, however, should have a twisted point and on cloth, a rounded point.

THREAD AND NEEDLE SIZES

NEEDLE SIZES		THREAD SIZES		
(Old)	(New)	Silk	Cotton	Linen
B	11	O	70	70
½	14	A	60	50
1	16	B	40	40
2	18	C	30	35
3	19	D	24	30
4	21	E	24	30
5	22	EE	20	25
6	23	F	18	25
7	24	F	16	25
8	25	FF	14	20

METALLIC FASTENER MACHINE A

General Operation

In shoe repairing there are many jobs where metallic fasteners are not only advantageous but necessary. The fasteners are cut from rolls of very fine wire which does not create uncomfortable, unsightly knots when

clinched, nor will it split delicate wood heels when used to attach top lifts. To attach the fasteners, several machines are available. One typical model will be discussed here to bring out the general characteristics, nomenclature, and operation of this kind of machine (Fig. 316).

Before attempting any work, it would be a good idea to get acquainted with the machine. First try raising and lowering the horning by pulling it up and then releasing it with lever *D*, Figure 317. Next drop the horn, lightly touching the foot pedal, and clip off a fastener. Try a variety of lengths by changing the setting on dial *L* at the right of the machine (Fig. 316). Now raise the horn, insert a few pieces of leather, set dial *L* to the correct length fastener and experiment with setting the fastener below the surface of the leather. This depth can be acquired by setting dial A, Figure 316.

In getting acquainted with the machine, do not overlook the guide A, Figure 317. This guide can be set in or out by turning the guide adjuster, *B*, Figure 317. To turn the guide back, press in on the adjuster knob, and turn it counterclockwise. You may also turn the guide aside so that it is out of the way. It will surprise you to learn how easy it is to operate this machine.

CAUTION: Do not at any time operate the machine without making sure the faceplate is screwed down tight.

RELOADING WIRE

CAUTION: *Be sure the motor is shut off before making adjustments or repairs on the machine.* (You may accidentally step on the starting peddle.)

1. Loosen screw *T* on the faceplate (Fig. 295).
2. Swing the faceplate out of the way (to the right).
3. Pull out the old wire between the feeder block H (Fig. 316) and the wire guide block.
4. Unscrew nut *D*.
5. Feed the end of the wire through the hole in the drum at *B*.
6. Place the new roll of wire in the drum (printed side out).
7. Push the wire through tube *C* (arrows), until it can be seen at space *J*.
8. Set the length selector *L*, to number 8.
9. Place a screwdriver in the slot at *M*, and work it up and down. This works the wire down through the feeder block *H*. Be sure to guide the wire into the hole in feeder block and cutters.
10. Always replace the faceplate before starting the machine.

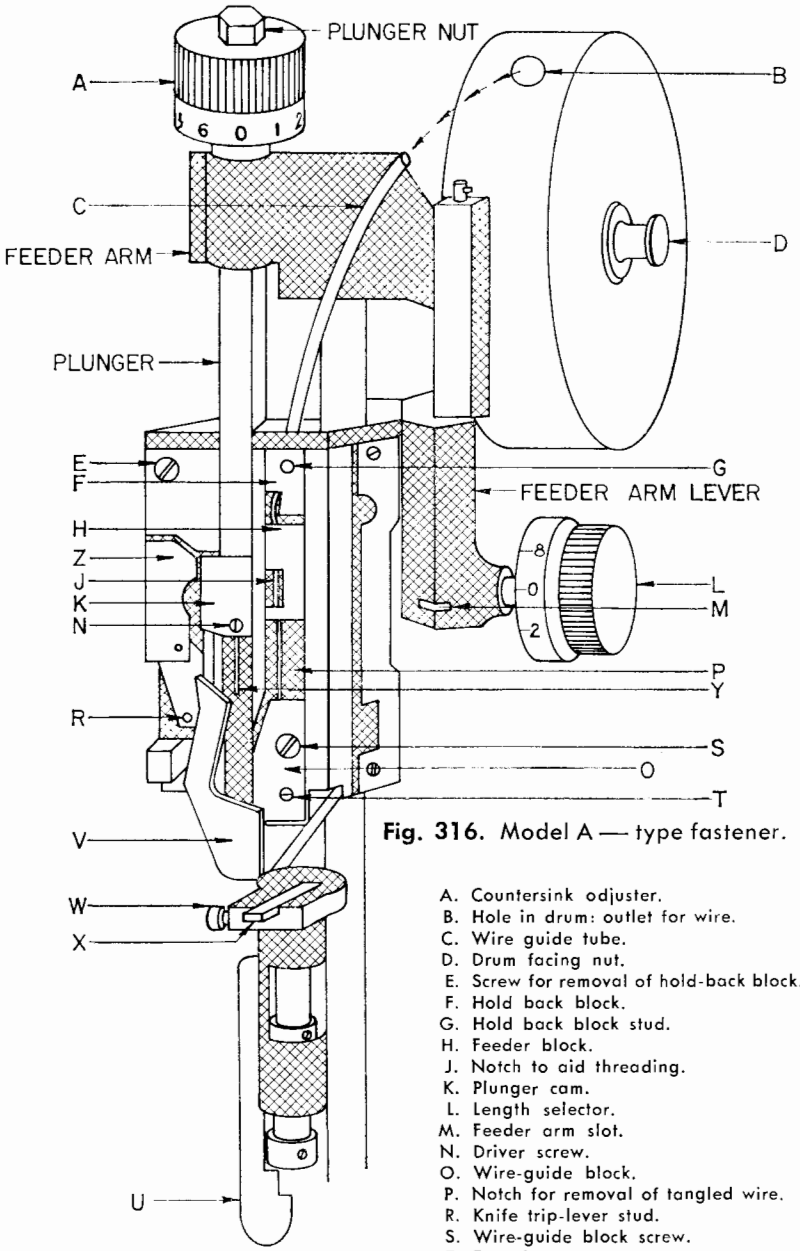


Fig. 316. Model A — type fastener.

A. Countersink odjuster.
B. Hole in drum: outlet for wire.
C. Wire guide tube.
D. Drum facing nut.
E. Screw for removal of hold-back block.
F. Hold back block.
G. Hold back block stud.
H. Feeder block.
J. Notch to aid threading.
K. Plunger cam.
L. Length selector.
M. Feeder arm slot.
N. Driver screw.
O. Wire-guide block.
P. Notch for removal of tangled wire.
R. Knife trip-lever stud.
S. Wire-guide block screw.
T. Faceplate screws.
U. Guide lack.
V. Knives (Cutters).
W. Guide adjuster dial.
X. Guide.
Y. Driver
Z. Knife trip-lever assembly.

LENGTH OF FASTENERS

The machine will cut the fasteners to any desired length up to and including 1 in. *L* in Figure 316 is the selector knob. Numbers on the rim of this knob indicate eighths of an inch. (Example: when set to number 4, the machine will cut fasteners ½ in. long, or when set to 5, it will cut fasteners ⅝ in. in length, etc.) For best results fasteners should be ⅛ in. longer than the total thickness of innersole and outersole. When set at O, the machine will not make fasteners.

FASTENERS NOT THE SAME LENGTH

If you find that the fasteners are not being cut to the same length, make the following checks.

1. See that the wire spool turns freely.
2. See whether the wire may be bent or tangled.
3. Check whether the feeder block, *H*, or hold-back block, *F*, Figure 316, or both, may be worn.

To remove the hold-back block, merely place screw *E* into threaded hole *G*, and pull out the block, using the screw as a handle.

COUNTERSINK

You may set the fasteners as far below the surface as you like or leave them flush with the surface by merely setting knob *A*, at the top of the machine in Figure 316. To set the fasteners flush with the surface, set the dial reading to "0." The higher the number the deeper the setting. Fasteners should be set deep enough so that they will not show on the surface of the finished job. If the countersink setting adjustment should slip or vary at any time, merely tighten the tension nut, *N*, behind and immediately below the countersink dial. Should the fastener heads appear rough, check the driver head, *Y*, for a broken or chipped end.

DRIVER

When fastener heads do not appear neat and smooth, remove and check the lower end of the driver, *Y*, Figure 316, as follows:

1. Shut off the motor.
2. Take out screw *N*, and remove the driver.
3. If the driver is rough or damaged, replace it, but first clean out the hole.
4. Push the new driver up as far as it will go and tighten screw *N*.
5. Be sure to close the faceplate before operating the machine.

MACHINE STALLS

Stalling may be caused by overloading or jamming the machine. If caused by overloading, shut off the motor for several minutes. Then turn on the motor and try again. Should the machine stall again, shut off the motor and check for the following:

1. *Chipped driver.* A chipped driver will allow the fastener to wedge between the driver and the wall of the driver hole.
2. *Driving too long a fastener.* Do not use a fastener more than ⅛ in. longer than the combined thickness of the leather being fastened.
3. *Driving several fasteners on top of one another.* This can jam the knives.
4. *Driving a fastener on top of an old nail.* If at all possible, remove all old nails.
5. *Operating the machine with the horn raised and no leather on it.*

JAMMING

If the machine jams at the bottom of the stroke the following instructions should be carried out:

1. Switch off the motor and lower the horn.
2. Disengage the Knife Trip Lever by placing a screwdriver against the top end (the right side), pushing it to the left by tapping the screwdriver with the heel of the hand.
3. Turn the hand rotating nut A (Fig. 318) on the end of the motor shaft

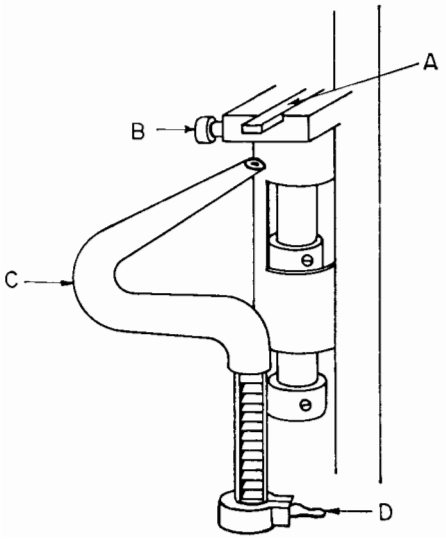


Fig. 317. Lowering the horn.

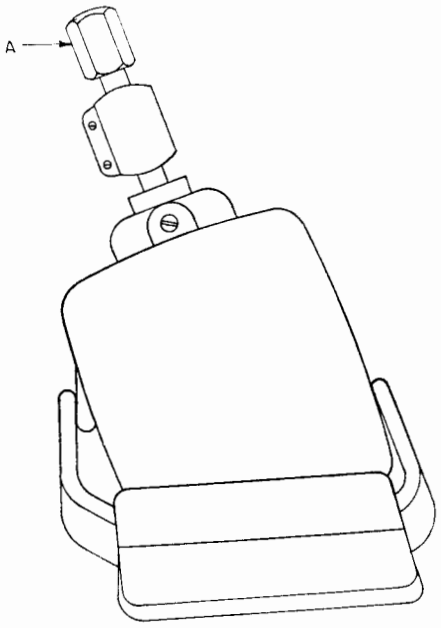


Fig. 318. Motor foot pedal assembly.

counterclockwise until plunger K (Fig. 316) reaches the top of the stroke.

4. Remove the snarled wire from the wire guide block.
5. Close the faceplate and set the fastener length selector on "O."
6. Turn on the switch.
7. Step on the pedal enough to make *one* stroke. The driver should push the clogged wire out of the knives. Should the driver break, shut off the motor promptly and open the faceplate.
8. Cut the wire between the feeder block and the wire guide block and remove the wire guide block.
9. Remove the two bolts in back of the cutters A (Fig. 319).
10. Both stationary and mobile cutters (Fig. 320) can now be removed.
11. Pull them apart and remove the pieces of the broken driver. If you cannot get the broken pieces out, they may be drilled out. This is an exacting task. Send them to the factory to insure a perfect job.
12. Upon their return, replace the cutters following the above instructions in reverse.
13. Put in a new driver, but first be sure the hole is thoroughly clean. Push it up as far as it will go.
14. With the jam cleared, reengage the knife trip lever by pushing it to the right until you hear a click.

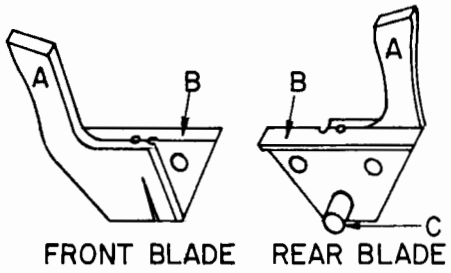


Fig. 319. Cutting blades.

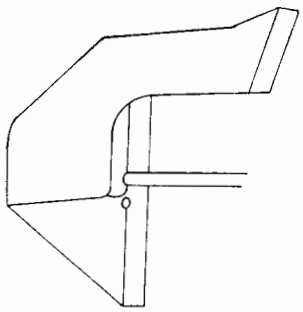


Fig. 320. Aligning the cutters.

15. Feed the wire into the wire guide block.
16. Screw the faceplate back into place.

SIGNS OF TROUBLE AND CAUSES

1. Fasteners are not the same or the desired length. Feeder block *H*, or hold back block, *F*, may be worn. The wire may be bent or tangled (see "Machine Stalls") or the wire reel may not turn freely.
2. The machine continues to operate after foot has been removed from the pedal. The clutch pin is broken, or the pedal is stuck.
3. The wire fails to feed. The feeder block may be stuck and need oiling or the feeder torsion spring may be broken.
4. The wire tangles at *P*, Figure 316. The knife trip lever *R* has become disengaged. Clear away the tangle and rethread the machine. Engage the trip lever by pushing it to the right.
5. Fasteners do not drive straight. Cutters or guide block *T* are worn.
6. Electric current cuts off. Look for an overload. (See "Machine Stalls," page 187.)
7. Fastener heads are rough. See "Countersink," page 186.

THINGS TO REMEMBER

1. Keep the machine clean and well oiled.
2. Do not make adjustments or repairs without first turning off the motor.
3. Do not operate the machine with the faceplate off or open.
4. Be sure the fasteners are the correct length.
5. When the machine is not in use, keep the horn down and the selector set at "0."
6. When starting the machine, do not use the first fastener.
7. Countersink fasteners enough so that they do not show on the surface after sanding the bottoms.

8. Keep the horn high enough to hold the shoe fairly snug, but not tight enough to bind.
9. Hold the shoe up against the cutters rather than down against the horn.
10. Never step on the starting pedal when the horn is up against the cutters.

OPERATION INSTRUCTION CHART

ITEMS ATTACHED	NAIL LENGTH	COUNTER SINK	HORN ATTACHMENT	GUIDE POSITION	NUMBER OF NAILS	NOTES
WOOD-CORE HALF HEELS (A) Attach the heel base.	To clinch in insole	0	Horn tip	out	10 to 14	
(B) Attach the heel to 1. Leather seat	7/8	6	Mushroom	out	8 to 12	
2. Rubber seat	8/8	6	Mushroom	out	10 to 14	
WOOD-CORE WHOLE HEELS (A) Attach the heel base.	To clinch in insole	0	Horn tip	out	10 to 14	
(B) Attach heel to 1. Leather seat	8/8	6	Mushroom	out	10 to 14	Use rubber cement.
2. Rubber seat	8/8	6	Mushroom	out	10 to 14	
MEN'S LEATHER TOP LIFTS	5/8	2	Mushroom	low	7 to 11	
WOMEN'S TOP LIFTS	4/8	2	Rotary Heel Cap	low	3 to 7	
WOMEN'S SOLES	Sole thickness plus 1/8"	2	Horn tip	high	Space 3/8" apart	Use rubber cement.
Men's half soles	Sole thickness plus 1/8"	2	Horn tip	high	Space 3/8" apart	Use rubber cement.
Toe pieces	Sole thickness plus 1/8"	2	Horn tip	high	Space 3/8" Apart	Use rubber cement.
Men's and women's leather shanks	To clinch in insole	0	Horn tip	out	Space 3/8" apart	Use pyroxylin cement. Use 2 rows of nails on men's.
THIN HEELS Same as for top lifts except spot the first nail in center of heel.						

METALLIC FASTENER MACHINE B

General Operation

Another kind of metallic fastener machine in wide use will be discussed next (Fig. 321). This machine is relatively simple to operate and service. As with the previous machine, it is always best to experiment on scrap material until you become familiar with and confident in operating the machine.

IN AND OUT OF GEAR

It is always good policy to leave the machine out of gear when not in use. To throw the machine out of gear, proceed as follows:

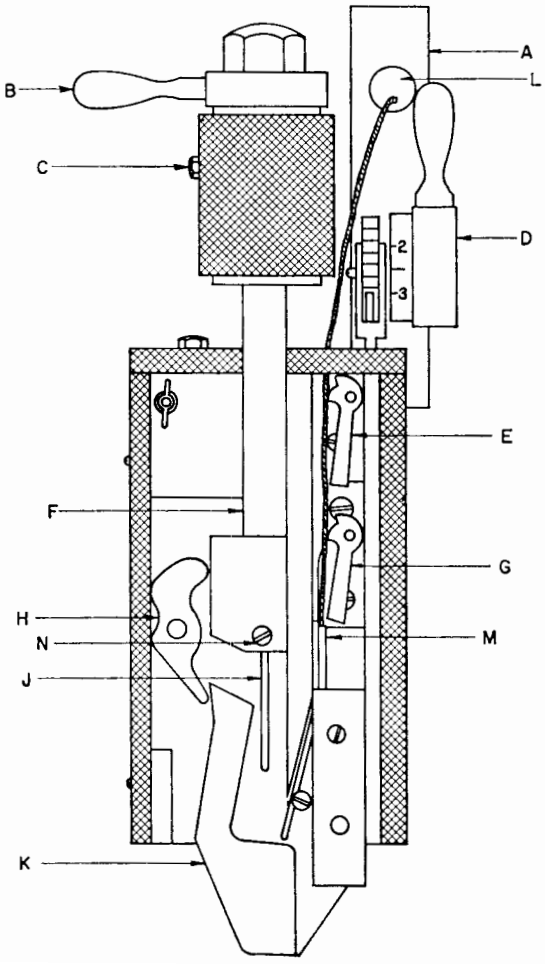


Fig. 321. Metallic fastener machine B.

1. Switch off the motor.
2. Release the feeder latch, *A*, Figure 322, by pulling it out with the left hand.
3. Turn the feeder cam to the position as shown in *A*, Figure 323.
4. To put the machine into gear, turn the feeder cam to the position shown in *A*, Figure 324.

RELOADING WIRE

1. Switch off the motor.
2. Straighten out the end of the wire, and pass it through hole *L*, in the drum (Fig. 321).
3. Feed the wire into the machine, past the hold-back blade, *E*, and the feeder blade, *G*, in Figure 321.
4. Guide the wire into the tube, *M*.
5. Close the faceplate, and put the machine into gear as shown in *A*, Figure 324.
6. Switch on the motor; be sure the horn is down and tap the foot pedal a few times. The machine will feed wire on down through the cutters.

TO REMOVE OLD WIRE

1. Switch off the motor.
2. Push the wire down so that it protrudes below the cutters (Fig. 315).
3. Cut the wire at the top of the machine head where it enters the machine, then pull it out through the bottom with a pair of pliers.

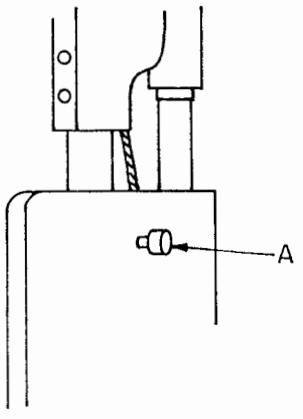


Fig. 322. Releasing the feeder latch.

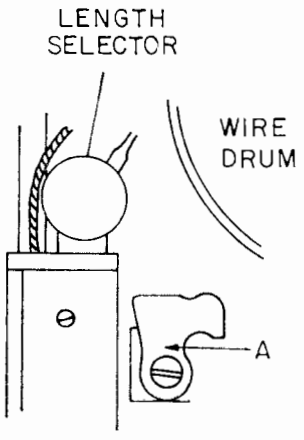


Fig. 323. Adjusting the feeder cam.

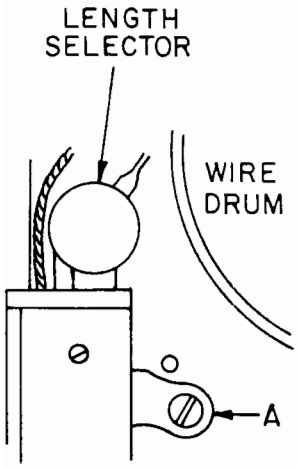


Fig. 324. Putting the machine in gear.

HORN

1. To raise the horn, simply lift it to the desired position.
2. To lower it, merely release level *D*, as with the previous machine (Fig. 317).
3. Lower the horn when you are through using the machine.
4. Do not operate the machine with the horn up, unless you have a shoe or piece of leather on the horn.

FASTENER LENGTH

It is important that fasteners be slightly longer than the combined thickness of the insole and outsole.

1. Set the proper length by turning the selector dial, *D*, Figure 321. The number indicates eighths of an inch. *Example:* When the dial is set to the number 3, the machine will cut a fastener ⅜ of an inch long. When set to 4, it will cut fasteners ½ of an inch long.
2. Discard the first fastener; it more than likely will be an off size.
3. After driving a few fasteners, examine the inside of the shoe for proper clinch.
4. If the fasteners are not uniform in length, the wire reel may be stuck, the wire may be tangled, or the hold-back blade, *E*, or feeder blade *G*, Figure 321, or both, may be worn.

COUNTERSINK

In order to insure neat work, the machine is equipped to countersink the fasteners. These fasteners can be set to any desired depth, by merely turning the dial *B*, Figure 321.

Setting dial handle B, Figure 321, to the right will make a shallow countersink, while shifting it to the left increases the depth. Fasteners should be set deep enough so as not to show on the surface when finished. If the countersink handle should appear to be loose, tighten nut *C*.

DRIVER

When fastener heads are not neat and smooth, remove and check the driver for a broken or chipped end.

1. Shut off the motor switch.
2. Loosen screw *N*, Figure 300, and remove the driver.
3. If it is rough or damaged, replace it.
4. Push the new driver up as far as it will go, and tighten screw *N*.
5. Be sure to close the faceplate before operating the machine.

MACHINE STALLS

The causes of machine stalls are as follows:

1. Operating the machine with the horn up and no shoe or leather on it. (Be sure the horn is down when running out the first discarded fastener.)
2. Driving two or more fasteners in the same spot.
3. When fastening soles across the shank, striking the steel shank.
4. Hitting nails or other metallic objects.

The method of fixing stalls is as follows:

1. Shut off the motor switch, and open the faceplate.
2. Pull out the cutter trip level, *H*, Figure 321. (It may be necessary to use the pliers.)
3. Raise the plunger *F* to top of the stroke by releasing the feeder latch, *A*, Figure 301.
4. Lower the horn.
5. Loosen screw *N*, and put in a new driver.
6. Throw the machine out of gear by your releasing the feeder latch and tripping the feeder cam, *A*, as shown in Figure 323.
7. Remove the movable cutter attaching nuts, *A*, Figure 325.
8. Take out the cutter blade and remove the obstruction.
9. In replacing cutters be sure they fit snugly, but do not bind.
10. With the knife, trip lever, *H*, Figure 321, removed, and machine still out of gear, close the faceplate, and operate the machine to cut one fastener.
11. If the machine throat is clear, push the movable cutter blade as far

to the right as it will go. Put in the knife trip level *H* (note the position in Fig. 321).

12. Now return the faceplate, put the machine in gear, and with the horn still down, cut several fasteners.

In case you did not succeed in clearing the cutters and must remove the stationary upper blade, proceed as follows:

1. Remove the front- and left-side cover plate from the head of the machine.
2. Remove the bolts, *B* and *C*, Figure 325.
3. Slide the cutter blade to left, and lift it out.
4. Examine the parts to be sure they have not been damaged.
5. If the obstruction is not easily removed, it may be drilled out. (Be sure this is done by a skilled machinist or return the machine to the factory.) The drilling must be exceedingly accurate and smooth, so before drilling, line up the blades with a new driver, as shown in Figure 319, before clamping them in a vise.
6. Use a No. 53 drill (.592). Do not use a larger one, or try to drill out a broken driver. (To insure an accurate job, send them back to the factory.)
7. Put the stationary blade back, pushing it to the right.
8. Replace bolts *B* and *C*, Figure 325, but do not tighten them.
9. Put the movable cutter blade in place, but do not put on the nuts.
10. Now tighten bolts *B* and *C*.
11. Replace the washer and first nut *A*, Figure 304. Do not put on second nut, which serves as a locknut, until the cutters have been correctly adjusted (snug but not tight enough to bind).
12. When tightening the second nut, be sure the first nut does not turn with it.
13. Replace the side plate.
14. With the new driver in place, and cutter trip level *H Out*, with the horn down and machine out of gear, put on the faceplate, and tap its foot pedal once to clear the throat of the machine.

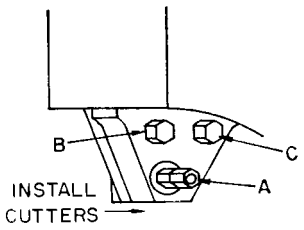


Fig. 325. Cutters.

15. Open the faceplate and push the movable blade to the right side as far as possible and replace the cutter trip lever *H*, as shown in Figure 321.
16. Replace the faceplate before operating.

GUIDE

To insure uniformity in the rows of fasteners, the machine is equipped with a guide like the one shown in the previous machine (Fig. 317). This guide can be set to any depth by turning knob *B*, Figure 317. You can also swing it aside, so as to enable you to use the machine in fastening soles across the shank.

TROUBLESHOOTING

1. If the feeder blade, *E*, or hold-back blade, *G*, Figure 321, is badly blunted, it should be replaced. If only slightly worn, it may be stoned. Stoning should be done from the underside of the blade. (Do not under any circumstances grind the blade.)
2. If the machine continues to operate after you remove your foot from the pedal, check for a broken clutch pin or a stuck pedal.
3. If the wire fails to feed, the movable cutter blade may be too tight or the feeder blade spring or hold-back spring may be out of place.

REVIEW QUESTIONS

Curved-Needle Stitcher

1. What is a curved-needle machine used for?
2. What will prevent the thread from snapping when starting the machine?
3. How can you prevent the machine from pinching the uppers between the welt and the worktable?
4. Why should you not speed around the toe?
5. How can you break or bend an awl or needle?
6. What will a worn needle guide do to a needle?

Trouble Chart

7. How much space should there be between the needle barb and the guide?
8. How far below the needle should the awl be on the downstroke?
9. How far to the left of the needle should the awl be before its downward stroke?
10. How much should the looper clear the thread hook?
11. What distance above the needle barb should the looper lay the thread in the needle?

12. After the thread lifter has separated the thread, which thread should it pick up?
13. What is wrong with the thread lock if you can pull out the thread?
14. What will excess wax do to the tension?
15. What is the purpose of the thread measure on this machine?
16. How is the tension on the bobbin adjusted?

Causes of Broken or Stranded Thread

17. What are the causes of broken or stranded thread?

Causes of Broken Needles

18. What are the causes of broken needles?
19. What size needles, awls, and needle guides are recommended?
20. What are the recommended sizes of top and bobbin threads?
21. How many stitches per inch for the needles listed in the table?

Straight-Needle Stitcher

General Operation

22. What is a straight-needle stitcher used for?
23. If the arch has a decided bend, how should the shoe be held?
24. If the welt is narrow, how should the uppers be held while sewing?
25. Which twist thread is used for the top, and which for the bobbin?
26. When replacing the awl or needle, what would cause the machine to jam?
27. Which direction should the needle barb turn when facing the front of the machine?
28. Which direction should the flat side of the awl face?
29. How far to the left of the awl should the needle be set?
30. How much should the eye thread thrower clear the needle when passing in front of the needle?
31. How far apart should the finger thread and eye thread throwers be?
32. What is the purpose of the auxiliary take-up?
33. How should the channel cutter be set in relation to the needle?
34. How can you set the lock deeper? How shallower?
35. What is the best operating height for the presser foot?
36. How should the work gauge rest on the newly attached sole?
37. How should the point of the needle and the loop opener line up?

Rules to Observe

38. How often should wax strippers be replaced?
39. Is the same length of stitch used for different types of shoes and materials?
40. What kind of stitches are made with a fine awl and needle?

Causes of Broken Needles

41. Should the awl and needle line up?
42. Should the shoe be pushed or pulled while being sewed?
43. What kind of awl and needle should be used for heavy work?
44. How should the shoe be held?

Causes of Broken Thread

45. What should be the condition of the thread?
46. How should the lock be set?
47. What will be the result of using a worn thread hook?
48. What are the correct needle and awl sizes?
49. What are the recommended sizes of top and bobbin threads?

Patching Machine

General Operation

50. What kind of materials will this machine sew?
51. In what direction does this machine sew?
52. How should the needle be set?
53. How is this machine threaded?
54. How is the length of the stitch regulated?
55. What should be the position of the presser foot?
56. How much pressure should the presser foot exert?
57. Why does a machine skip stitches?
58. What are the correct needle sizes?
59. What are the recommended sizes of silk, cotton, and linen threads?

REVIEW QUESTIONS

METALLIC FASTENER MACHINE A

Metallic Fastener Machine A

1. What type of wire does this machine use?
2. From what is this fed through the machine?
3. What is meant by "getting acquainted with the machine"?

Reloading Wire

4. Is it necessary to remove the faceplate when reloading the wire?
5. How should the wire reel be placed in the drum?
6. How far through the tube should the wire be pushed?
7. How is the wire pumped through the feeder block?

Length of Fasteners

8. How long a fastener will this machine cut?
9. What do the numbers on the selector knob indicate?

10. How much longer than the thickness of the work should the fasteners be?

Fasteners Not the Same Length

11. What may happen if the wire spool does not turn freely?
12. In what way does tangled or bent wire affect the length of fasteners?
13. What other conditions cause uneven fastener lengths?

Countersink

14. What is the purpose of countersinking the fasteners?
15. Where is the countersink control located?
16. Can this machine be operated so as to permit the fasteners to remain flush with the surface?

Driver

17. Why should no repairs be made without first shutting off the motor?
18. What should be done with a rough or damaged driver?
19. Why are we continually reminded not to run the machine without first closing the faceplate?

Machine Stalls

20. What causes the machine to stall?
21. How can one tell if overloading caused the machine to stall?
22. What must be done if the stalling is not caused by an overload?

Jamming Knives

23. Do the cutters need to be removed to remedy this condition?
24. What are the various steps in removing cutter blades?
25. What is the recommended procedure if the broken driver is wedged in too tight?
26. How can one tell if the cutters are in perfect alignment?
27. With the cutters clear, how far to the right should the trip lever be pushed?

Signs of Trouble and Causes

28. What may result from a worn feeder or hold-back block or both?
29. What will result from a tangled fastener wire?
30. What may happen if the clutch pin breaks, or the pedal sticks?
31. What will happen if the feeder block sticks?
32. What is wrong if fasteners do not drive straight?
33. What should you look for if the machine suddenly stops?

Things to Remember

34. What is essential to long and efficient operation of any machine?
35. What may happen if you do not first shut off the motor when undertaking repairs?

36. Is it important that the faceplate be in position before operating the machine?
37. Is it better to hold the shoe up against the cutters, or down against the horn?
38. Is it advisable to step on the starter pedal when the horn is up and no leather or shoe is between the horn and cutters?

METALLIC FASTENER MACHINE B

In and Out of Gear

39. Should the machine be left in gear when not in use?
40. What is the procedure in placing the machine in neutral?

Reloading Wire

41. What is the first step in putting in a new roll of wire?
42. How do you get it past the hold-back and feeder block?

To Remove Old Wire

43. How far below cutters should wire be pushed, preparatory to removal?
44. After cutting the wire at the top of the machine, how can it be removed from the machine?

Horn

45. What must be done to raise the horn?
46. What must be done to lower the horn?
47. In what position should the horn be when the machine is not in operation?

Fastener Length

48. What should be done with the first fastener when starting to operate the machine?
49. How can you determine whether the fasteners are the correct length for the shoe?
50. What may result, when the reel does not rotate freely?

Countersink

51. In this machine, what will be the result, if the countersink dial handle is set to the right?
52. To increase the depth, should the handle be set to the right or to the left?
53. How can the dial handle be tightened if it should work loose?

Driver

54. What should be done if fastener heads are not smooth?
55. What should be done with a rough driver?

Machine Stalls

56. What position should the horn be in when there is no shoe on it?
57. What is essential when fastening soles across the shank?
58. Why should one be careful that fasteners do not strike nails or other metal?
59. When replacing cutters, how tight should they be?
60. In what direction must you slide the cutter blade in order to remove it?
61. What size drill should be used, in case you need to drill out a broken driver?

Guide

62. What purpose does the guide serve?
63. Has this guide more than one setting?
64. Can this guide be removed in order to fasten soles across the shank?

Troubleshooting

65. What should be done with feeder block when it is seriously blunted?
66. How may a slightly worn block be restored?
67. Is it permissible to use a grinder to recondition it?

GENERAL QUESTIONS

1. Give the names of the four machines described in this chapter.
2. Tell what each machine is used for.
3. Describe the possibilities of these machines.

CHAPTER 14

The Repairman as a Businessman

THE PROVERBIAL SHOESTRING

It is often said of a successful businessman that "He started on a shoestring"; or, if he turned out to be a failure, that "He went broke for the lack of a shoestring." It is true that many times a small item like a shoestring will hold a good customer or turn him over to a competitor who also will be doing future repairwork for this individual.

Satisfying immediate needs is what makes for success in a business. Drugstores, variety stores, and many others carry all kinds of shoes' accessories, not as an accommodation, but because the sales of such items alone are not only profitable but create other business. Why, then, should not a shoe repairman have these benefits which rightfully belong to him? It does not take a large investment to carry an assortment of laces, polishes, dyes, insoles, white, colored, and suede cleaners, etc., which are sold with many repair jobs.

ESSENTIALS TO SUCCESS

It should be remembered that establishing oneself in business, especially in a residential area, is far different from working for an employer. A shoe repairman never should go into business with the idea that since he is working for one shop he can do as he pleases. Instead of working for one boss he now will be working for many bosses, because he will be working for his customers who many times are very exacting in their demands and critical about the repairman and his shop.

SHOP HOURS

Most important are the shop hours which must be so arranged to accommodate the greatest number of customers, and these hours must be adhered to religiously. It is well always to be on hand during such hours to be able to discuss a customer's problems with him.

RECEIVING SHOES

Shoes never should be accepted for repair without having been examined in the presence of the customer. They may need more repair than the customer asked for, and such work should not be done without his consent. A pair of full soles or an expensive pair of half soles never should be attached to shoes, the general condition of which will not warrant such expenditure. Such soles may be but partly worn when the rest of the shoes gives way and as a result the customer will come to the conclusion that "It does not pay to have shoes repaired."

PERSONALITY

It is good to advertise because it will bring customers, but from there on it is up to the shop owner to conduct himself in such a manner that will hold customers and expand his business.

A shop owner always should be courteous, honest, and fair in all business dealings, and neat in personal appearance.

SHOP CLEANLINESS

To be successful, it is not necessary to have an elaborate shop, but one that is neat and clean. It should not be a meeting place for idlers, but one that women and children will enter without hesitancy.

Neglect in sweeping and dusting will show carelessness that may also make its appearance in the shoe repairwork. If there are show windows, accessories should be displayed and changed frequently to keep up the appearance.

COMPETITION

Most neighborhoods have enough repairwork to keep more than one shop busy. It, therefore, is not necessary to rush a job and do it poorly merely to have time for more customers. Even though a good job takes more time, it will pay in the end and bring and keep new customers who would not have come if the work had been poorly done.

REVIEW QUESTIONS

Miscellaneous Information

1. What makes for success in the shoe business?
2. Aside from repairwork, what items should be sold in a shop?

3. Who is considered the boss of a shoe repairman who is in business for himself?
4. How should shop hours be arranged?
5. What must be done before accepting shoes for repair?
6. When should full soles or expensive half soles not be attached?
7. How should a shop owner conduct himself?
8. What kind of a shop will hold customers?
9. Why should repairwork always be done as well as possible even though it takes more time than a poor job?

GENERAL QUESTIONS

1. Is a good repairman always a good businessman? Illustrate.
2. Compare two shoe repairmen whom you know, using the points learned in this chapter. Which is the more successful? Why?
3. Outline a program for improving some shoe-repair business which you know.

Glossary

Army Stud Hooks. Lacing hooks used on logger boots.

Back. A side of leather minus the head and belly.

Backing. A fabric reinforcement, cemented to leather, to fortify, plump, or stiffen it.

Backstrap. Same as pullstrap.

Ball. The part of a last corresponding to the fleshy part of the foot, just back of the toes.

Balmoral ("Bal"). Method of joining quarters and vamps (p. 31).

Beading. Eliminating raw edges, by folding them under, after skiving.

Bellows Tongue. A tongue that is stitched to the quarter all the way up to the top.

Belly. The underside of a hide or skin (Fig. 252).

Bend. Side of leather from which the shoulder and belly have been removed.

Binder. Adhesive material used in holding two or more substances together.

Blind Eyelet. Metal lacing ring clinched through eyelet stay and quarter lining, not including the quarter.

Bloom. White powderlike exudation on finished leather as a result of using certain types of tanning materials.

Blücher. Method of joining quarters and vamps (p. 31).

Breast. The front or innerside of the heel (Fig. 145).

Buckram. A coarse cloth impregnated with a sizing material – used in stiffening bows, toe boxes, etc.

Buffing. Scraping or sanding shoe bottoms, in making suede or ooze; removing blemishes or preparing leather for finishing.

Burnishing. Producing a bright glossy finish on leather by means of friction or preheated machinery.

Butt. Tail end part (or strip) of a side or bend of leather (Fig. 235).

Buttonfly. Flap attached to button shoe quarters containing the button holes.

Butt Seam. Seam uniting two pieces of leather end to end (p. 31).

Calk. Metal shoe accessory screwed or driven into the sole to prevent slipping.

Chain Stitch. A loop stitch.

Channel. Slanting cut in leather, in which to conceal stitches – closed and sealed with cement.

Counter. Cowhide, pigskin, various types of fiber, pulpboard, and cork stiffeners that support the back of a shoe around the heel.

Crimping. Stretching upper leather, to conform to required shapes or positions.

Crock. Discoloration or fading of dyes.

Crop. Side of leather minus the belly.

Cuban Heel. A medium heel with a curved back and straight breast.

Custom Shoe. Shoe specially made to an individual's specific measurements.

Doubler. An added protective and plumping lining.

Dutchman. Wedge-shaped (tapered) piece of leather, inserted between two soles or welt and soles.

Edging. Tapering or beveling edges of leather.

Eyelet. Metal rings placed in fore part of shoe to facilitate lacing, prevent stretching or tearing of the quarters. See blind eyelet.

Fair Stitched. See stitched aloft. (Not channeled.)

Findings. Small accessories other than leather used by repairmen.

Goring. Loosely woven fabric containing elastic threads.

Grain. The hair side of a hide or skin.

Gum Tragacanth. Yellowish water soluble powder used in finishing leather.

Gussets. Inserts used in gaining additional width.

Heel Gripper. Metal or fiber insert used to draw a flimsy insole tightly against the heel.

Heel Pad. Leather, felt, imitation leather, or other materials used in covering nails or other metallic fasteners in the heel part of the innersole.

Heel Seat. The area at the rear of the sole on which the heel is seated.

Heel Slugging. The operation of driving a row of metal slugs around the outer edge of a heel.

Heel Supports. Right angle shaped metal fastened to the shank and breast of the heel as an added reinforcement.

Hide. Pelt weighing more than 25 pounds.

Hobnail. Nail with a heavy corrugated head driven into the sole to forestall excessive wear.

Iron. 1. Measure of thickness for sole leather. 2. Tool for burnishing heels and soles (see p. 64).

Isinglass. Fish glue.

Juliet. Woman's high-cut slipper with elastic (Goring) sides. Same as man's slipper Romeo (Fig. 31).

Kip. Pelt weighing from 15 to 25 pounds.

Latex. A milky substance from trees and shrubs, used in making leather adhesives and finishes.

Mordant. Substance used in creating an affinity between the leather fibers and the dye.

Ounce. Measure of thickness for light leather: 4mm. or 1/64 in.

Plug. A piece of leather covering the area of the waist and ball of the foot supplanting a like piece cut from the vamp.

Pickling. An operation prior to the tanning of hides and skins.

Piping. A narrow strip of leather or cloth folded and inserted at the edge of a seam.

Pyroxylin. Cellulose base adhesive used as a permanent attachment.

Rand. A narrow strip of leather placed around heel seat, and tapered to a level rounded bottom. Same as rim on full rubber heel.

Soapstone. A soft stone composed mainly of talc (hydrous magnesium silicate); talc – often referred to as French chalk.

Stitched Aloft. Soles stitched in a groove, not in a channel (Figs. 48–209).

Throat. Area of a shoe where vamp and tongue are joined.

Tongue Pad. Felt pad attached to inside of tongue for comfort and frequently for taking up slack caused by narrow instep.

Veal. Large calves, near age of maturity. See *kip*.

Waist. Narrow part of the foot immediately above the ball.

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