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BOOT REPAIRING by Adhesive and Other Methods

BY

D. LAWRENCE-LORD

("Consultant," *Shoe and Leather News*, London).

Author of

"Practical Boot Repairing by Machinery," "The Modern Boot and Shoe Repairer," "The Modern Boot and Shoe Maker" (Repairer's Machinery Section), &c.

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PREFACE

It has been sought in this little work to explain lucidly and in detail every method by which, without machinery, boot and shoe repairing can be done in the most effective and up-to-date manner.

Particular attention is given to what may be called adhesive work, which is dealt with thoroughly and effectively in every aspect. But, as well, there are full details of all other systems of repairing, so as to provide a really practical and reliable guide which will enable amateurs to do their own work well, and craftsmen to learn many a wrinkle for greater efficiency.

All modern methods are dealt with, and step by step guidance is given for all varieties of foot-wear.

As in every craft, development has been rapid in recent years, and the most important in the manufacture

and repair of foot-wear is considered to be the employment of adhesives for both leather and rubber.

At the last Shoe and Leather Exhibition in London, International competitions in adhesive repairing were held, with medals and diplomas to the successful. In every direction there has been an eagerness to find perfection, and in all these activities the writer has been closely associated.

With confidence, therefore, this handbook is issued as a sure guide to repairers, both trade and amateur; a work which will enable results of which no craftsman need feel ashamed.

D. L.-L.

Boot Repairing by Adhesive and other Methods

CHAPTER I

Explanatory

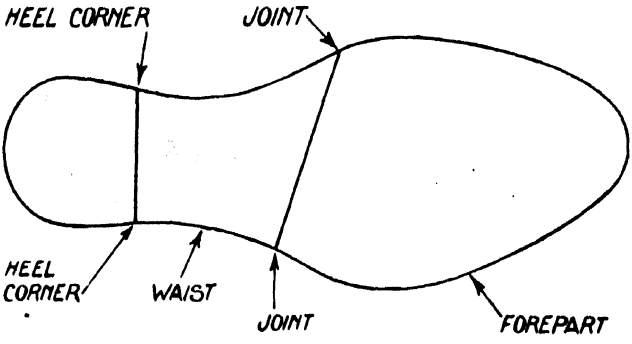
THE adhesive method of sole attaching means, briefly, the dispensing with the use of sewing awl and waxed threads, by which the parts are sewn together, or the alternative use of nails or rivets. Instead of these methods, an adhesive, such as a rubber cement, or solution, is employed.

This manner of attaching the sole is applicable to the manufacture of most styles of boots and shoes, or slippers, but whilst the method of using the adhesive is practically the same in all cases, there are various ways of preparing the boots, or shoes, according to the style, or manufacturing practice in vogue.

For the purposes of efficiency in operating the adhesive system, and to obviate injury to good boots or shoes, in the details of preparing them for the adhesive process, the beginner will require some explanation as to the various methods of manufacture, and some hints by which to distinguish one style from another, as well as the necessary method of preparation for each.

Styles of Manufacture.—The foot-wear usually purchased by the general public may be classed as follows : Welted, machine-sewn, turn-shoe, veldtschoen, and riveted goods.

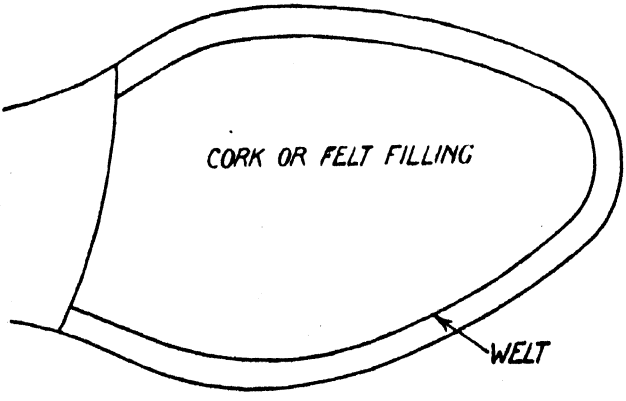
Welted goods are made up, generally, in men's and women's lines; machine-sewn chiefly in women's



Positions of joint and waist of outer sole.

and maids', veldtschoen in children's, and riveted in all classes.

Welted.—The system of making a welted boot is



Showing positions of welt and "filling" in a welted shoe.

on the old hand-sewn principle, now carried out by the aid of machinery. The upper, and a strip of leather extending around the edge of the upper to the corners of the heel, are sewn on the inner sole through a ridge, termed an inseam, which is cut, or carved, on the inner sole to receive the stitches. Having been sewn in, the strip of leather referred to, which is termed a welt, is forced or beaten away from the upper to project outwards, so that when the real, or outer sole is stitched to this strip, or welt, the welt itself gives the appearance of an underneath sole, whereas it is merely, as explained, a strip of leather only, running around the shoe to the heel corners. The centre space of the boot, within this welt, is filled in with cork dust, or felt, and the outer sole is then attached, by means of stitches through the welt and the edge of the outer sole. This principle is exactly the same whether the boot has been made by hand or by machine. For the adhesive process, the treatment of this welt, or strip, after removal of the sole, is different to that required for other types of footwear, as will be explained.

Machine-sewn Type.—This class differs from the welted type in the following details. No strip, or welt, is employed. The upper is turned over, and fastened by means of small tacks, to the inner sole. An actual sole, reaching only to the waist, or narrow portion of the boot, is temporarily fixed, then an outer sole, extending to the heel, is added, and the whole attached by means of a machine, termed a sole-sewing machine. The needle of this machine carries the stitches right through the outer sole, the

under sole, and the inner sole, and the stitches lie on the inner sole, next to the foot of the wearer. A leather, or paper, sock is then pasted inside the shoe, and this hides the stitches from view. In some cases the under sole is dispensed with, the outer sole by itself being thus sewn to the boot, and this type is known as the single-soled machine-sewn boot, and the former type as machine-sewn, with middle sole. The finished appearance of both the welted and machine-sewn types of boots is, to the uninitiated, practically identical, though easy to distinguish by the trained bootmaker, so that some safe guide for identifying one make from the other is very necessary. The following details are a certain guide by which the unskilled will, at once, be perfectly able to distinguish the welted from the machine-sewn boot. They will thus obviate injury in repairing, as well as add to efficiency in the work of attaching the sole by the adhesive method.

Distinguishing the Make of Boot.—In making the welted boot, the stitches securing the outer sole are placed on the strip, or welt, *outside* the boot. Examination will show that the surface of the inner sole inside the boot is perfectly smooth, and there is no sock pasted in, with the exception of a small sock at the heel only. In the machine-sewn boot, as stated, a sock is pasted in, and this sock covers the whole of the inner sole from heel to toe. In some cases, the impression of the stitches, lying on the inner sole, may be seen showing through the sock. This is when the sock is of a very thin substance. If a stout sock is used there is no such impression, but if the sock is slightly lifted the stitches will be plainly seen. By this

knowledge, therefore, the difficulty of recognising one make from another is easily overcome. It practically amounts to this : No stitches on the inner sole means a welted boot, and stitches showing on the inner sole indicates a machine-sewn boot. There are, however, types of boots, other than welted, that show no stitches on the inner sole, as will be explained.

Veldtschoen.—This is a very popular type of shoe for children's wear, and a type which presents much difficulty in repairing, even to the trained bootmaker, if the shoe has to be re-soled by the ordinary method. But by the adhesive process, the operation becomes one of simplicity. The principle upon which this type of shoe is made is so elementary as to be almost primitive. The shoe comprises, practically, merely an upper and outer sole only. The edge of the upper is simply turned outwards, and stitched down to the edge of the sole. The only addition is a very narrow strip of leather, which is placed between the edges of the upper and the outer sole, and stitched together with them. This is termed a " rand," and is intended to strengthen the upper against the pull, or strain, of the stitches during the wear of the shoe, but its danger to the uninitiated is that it gives the appearance of an under sole. Deceived by this, the worker may attempt to remove the sole, when he finds there is nothing left but the upper, as the outer sole is also the inner sole. This boot can be recognised by close examination of the edge of the sole, which will distinctly reveal the edge of the upper. Further close examination will show that there are no stitches in immediate view on the inner sole, whether the shoe is fitted with

a sock or not. The crease of the upper against the inner edge of the sole will also be noticed.

The Turn-shoe or Pump.—The construction of this shoe is on the same lines as the veldtschoen, in so far as it has only an upper and outer sole, without any inner sole. In making this type, the upper is turned inside out, and the edge of the upper is stitched on the surface of the sole by means of rather long stitches. After this operation, the shoe is turned right side out, hence the name of " turn-shoe." The inside of the shoe is next fitted with padding and a sock. It has then the appearance of a light machine-sewn boot of the single-soled variety. Should the worker, however, attempt to remove the sole he finds, as in the case of the veldtschoen, that there is nothing left but the bare upper, except for the padding referred to. To recognise the turn-shoe from the machine-sewn type the sock should be lifted up, and the padding also, and the raw edges of the upper, together with the long stitches, will be quite plainly seen. It will be obvious that it should be made quite certain whether what may seem to be a machine-sewn boot is not a turn-shoe, otherwise irreparable and possibly costly damage may result, as this type of shoe is made up in the most expensive, as well as the cheapest, of lines. The turn-shoe is even more difficult to repair by ordinary means than is the veldtschoen, but it lends itself well to the adhesive method.

Riveted Work.—Boots and shoes of the riveted class are made on just the same lines as machine-sewn goods, except that rivets, usually of brass, are used in place of stitches. Boots made by the screwed method

also come into this category, being attached with what are, to all intents and purposes, thin rivets with a thread. Such boots are, of course, easily recognised by the rivets, or screw heads. Little need be said of this class of footwear, as the adhesive method is seldom applied to such goods. The reader may, however, at times, desire to treat such goods by the adhesive process, if only for experience, and the subject will, therefore, be briefly dealt with in later pages.

CHAPTER II

The Adhesives

THERE are several types of adhesives for this stuck-on method of boot repairing. These comprise mineral cements, rubber latex, rubber solutions, and some types of vegetable, and mineral, glue. Some of the adhesives are used hot, some cold, some are quite a long time in drying, whilst others dry rapidly, some require a heavy coat and others a light coat, whilst some are highly inflammable and dangerous, and others are non-inflammable and non-toxic. There is just as much variation in the tenacious qualities, and many adhesives on the market are not fully reliable, whilst others, of whose tenacity there is no doubt, require such a nicety in handling, and the system of using is so complicated, as to create a problem for the average user. The adhesives selected should be non-inflammable, non-toxic, easy to apply and spread, and, of course, of undoubted tenacity, or sticking ability.

Suitable Adhesives.—The writer, as an expert, has had great experience of all classes of adhesives for the shoe and allied trades, and has recently been engaged in testing various makes for the purpose of deciding upon one which shall possess the advantages necessary for safe use by the average repairer. One adhesive is known as celluloid cement, and whilst all cements of this class certainly have good holding powers, they

are exceptionally, and dangerously, inflammable. The particular adhesives recommended by the writer are the following: Xetal Stabilised Rubber, No. 13 Solution, Stycco Solution, Bateman's Solution, Securitas Rubber Solution, and Holdtite Adhesive. Any of these may be obtained from the usual leather and grindery shops, and, in some cases, at branches of the large stores. All of these adhesives will attach leather to leather, leather to rubber, leather substitutes, crepe rubber, felt, etc. No preparation of the products themselves is required in any way. They are used straight from the containers, as received.

Attaching the Soles—*The machine-sewn boot or shoe.*—As this type of boot, or shoe, constitutes the bulk of manufactured foot-wear eventually needing to be re-soled, it shall be dealt with first. We will take the machine-sewn boot, which has an under sole, or "middle sole," as it is technically termed.

Removing the outer sole.—This is the first operation, and means simply lifting up, and cutting away, the outer sole to permit of the attaching of the new sole of leather, rubber, or leather substitute, as the case may be. To effect the removal of the sole, a short sharp knife must be used. This is inserted between the outer and the under soles. The starting point is the commencement of the broad part of the sole, termed the joint, just above the narrow, or instep part of the sole, termed the waist. The knife, having been inserted to about half an inch of its blade length, between the two soles, is now pulled firmly around the sole edge to a point opposite the starting point, thus cutting the stitches which have held the

sole to the boot. At intervals, obstruction may be found by the point of the knife coming against the blinder, a kind of nail which, during the manufacture of the shoe, is driven through the outer sole to the under sole, to hold the sole in position whilst putting in the stitches by the machine. When one of these blinders is reached the knife should be withdrawn and again inserted just beyond. The outer sole can now be turned back, and it should be cut straight across at a point half an inch beyond (nearer the toe) where the cutting of the stitches was started. The knife should next be placed nearly flat on the sole in the waist (nearer the heel) about half an inch from the newly cut edge. This half-inch of the sole should be skived, or thinned down, gradually to the thickness of paper at the cut edge. The under sole, or middle, must next be examined for security. This under sole may have been sewn down separately, during manufacture, by the machine, but, if not, it will require to be secured. This will be done by placing the boot upon an iron foot, or repairing stand, and driving through the middle sole short tacks, specially made for the purpose, and termed tingles. These should be of a length suitable just to reach the surface of the iron foot when driven through the middle sole and the inner sole. If the middle sole has, however, been previously sewn down by the machine, no further securing will be necessary, but the part of the old sole which has been thinned down will require to be secured, by tingles, in the manner described.

Roughing up.—We now come to the question of actually preparing the middle sole for the application

of the adhesive, or cement. The surface of the middle sole will require to be roughed up to permit proper penetration of the adhesive. This can be done by means of an old rasp, a piece of hack-saw blade, or, in cases of very light material, by means of a stiff wire brush. The idea is to loosen the surface of the leather, and remove all grit. After this roughing up has been done the leather should be well scoured with a stiff brush. The new sole is next skived, or thinned, down at the waist to just the same extent, and in exactly the same way as the old sole was thinned down. The flesh side (that is, the under-side) of the new sole will next need attention. All the loose flesh, or material, will require to be cut or rasped away. The object of this is two-fold. In the first place, should the adhesive be merely laid on the sole on top of the loose flesh, during wear of the shoe the loose flesh will break away from the rest of the leather, and the sole will leave the boot. Secondly, removing the loose flesh permits the lifting, or roughing up, of the real fibres of the leather, and it is these which have to carry the adhesive. In roughing up the middle sole it is necessary to take care that the securing stitches, or the tingles, have not been disturbed. The boot, and new sole, are now ready for the coats of the adhesive.

Applying the adhesive.—The adhesive is best applied by means of a rather stiff brush of the flat type. With the exception of Xetal Stabilised Rubber, and No. 13 solution, the process is as follows : A coat is given to the middle sole and the new sole, and allowed to dry. When thoroughly dry, a second coat is applied. This coat must be allowed to reach

what is termed the tacky stage, that is, when the coat is just on the point of drying off. This can be ascertained by touching the adhesive with the finger-tip, and if the adhesive pulls slightly then it is the correct moment to stick the sole on to the boot. The boot should now be placed upon the last, or iron foot, and the new sole placed carefully in its correct position. The new sole should be carefully, and firmly, pressed down in the centre for a start. From this point pressure should be applied down the sole, towards the heel, by sliding the palm of the hand over the sole in that direction with as much pressure as possible. Next, again starting from the centre, the forepart of the sole, working towards the toe, should be treated in the same way. The edge of the sole, all the way round, should now be firmly pressed down. This should be followed up by hammering the sole down gently over all its surface. This is best done by using a wooden mallet which provides for a good portion of the sole being covered at each tap. The hammering down should be started at the centre of the sole, then towards the waist, then from the centre again towards the toe, and, finally, around the edge, and across the waist. This method is to make certain of excluding all air from between the soles. If air is left in (termed " air pockets ") the pressure of the foot, during walking, will result in the loose air lifting the sole from the boot.

In the case of using either Xetal Stabilised Rubber, or No. 13 solution, the first coat is allowed to dry. Then the second coat must also be allowed to get dry, bone dry, in fact. The parts then placed together will at once attach. It does not seem possible that,

the coats being bone dry on boot and sole, attachment can be made, but this is so in the case of these two adhesives, and no attachment can possibly be made if the parts are placed together whilst the adhesives are damp. The job is now ready for the finishing process, explained later in the book.

The Welted Boot.—The removal of the old sole is accomplished in the same way as described for the machine-sewn boot, by severing the stitches between sole and welt. This will be a rather easier process in the welted boot as no blinders, or other obstructions, will be encountered. After the thinning down of the old sole at the waist, as described, the preparation for the adhesive differs in one detail. As previously mentioned, instead of the removal of the old sole revealing an under, or middle, sole, there is merely a narrow strip of leather around the boot, and within this a filling of cork dust, felt, or a chemical compound. The filling must not be in any way disturbed, and the strip, or welt, itself has only to be prepared for the adhesive. Now, this strip, or welt, contains the stitches which secure the whole foundation of the boot. Therefore, careful handling is very necessary, for if the stitches should be cut, weakened, or damaged in any way, the security of the foundation of the boot is impaired. An old rasp is best used to rub around the surface of the welt for roughing up. The rasping should be done, not over the top of the stitches, but along each side of them. This should be followed up by the use of a wire brush. The thinned down portion of the waist of the old sole cannot be held down by the use of tacks, or tingles, as in the machine-sewn

boot. It should be stitched to the welt by means of waxed threads. Failing that, it should be solutioned down. In that case, the under side of the waist will need to be roughed up. The waist, and welt beneath it, is then coated with solution, and attached before anything else is attended to. The process of applying the adhesive, and method of preparing the new sole, is then the same as for machine-sewn. Before attaching the new sole, the waist should be hammered down and made level. It should be noted that, in stripping, or removing, the old sole from a welted boot, the knife, after being inserted between the welt and outer sole, should be held quite level or slightly tilted towards the outer sole. Otherwise there is a big risk of cutting the welt itself, and this would mean an awkward repair.

The Single-soled Machine-sewn Boot.—Here, again, the operation varies somewhat in the matter of the removal of the old sole, and preparing the boot itself for the application of the adhesive, as compared with the machine-sewn boot with an under, or middle, sole. The stitches have to be cut in the same way to release the sole, but the danger is that there is no protection, between the upper and the outer sole, against the upper itself being cut. It is therefore very important that the knife should be held at such an angle, during the cutting, as will ensure the safety of the boot upper. The point of the knife should be tilted towards the sole, and not downwards towards the upper. There is no middle sole to prepare, and the removal of the old sole reveals the edge of the upper, turned over on the inner sole, with a filling in the centre similar to

that of the welted boot. The edge of the upper itself, therefore, has to be prepared for the application of the adhesive, and the necessity for this being done with care and efficiency will be obvious when it is realised that the edge of the upper alone has to carry the new sole, for fillings, either in welted or machine-sewn boots, have no holding capacity. The preparation of the upper's edge is a delicate operation, as a rasp or hack-saw blade cannot be used. To prepare the turned-over edge of the upper, the best method is carefully to scour the surface with medium glass-paper. Then it should be gently brushed with a wire brush. The adhesive is then applied to the upper, seeing that it spreads well to the edge. In this case, three coats of adhesive should be applied to the upper, and two to the new sole. The rest of the procedure is exactly as in the case of the machine-sewn boot with middle sole, as described.

Clumping.—Another way of treating the single-soled machine-sewn boot is by clumping; that is, not removing the old sole but placing the new sole on the top. The old sole will, probably, be unlevel in places as a result of wear, and it will require to be rasped down level, and thinned down also by the same means. Short tingles are then driven through the sole, close to the edge, all round. Care must be taken that the tingles are not placed too close to the edge or they may turn outwards into the upper. The tingle should be held at an angle, the heads slightly outwards towards the upper, and this will ensure the point going forward, inward towards the sole, instead of outwards to the upper.

The Turn-shoe.—This style of shoe is the next in importance, and it requires really careful handling. Soles, of course, cannot be removed, so the new soles have to be placed on the top, or clumped. It is necessary to remember that the turn-shoe is so made to get extreme lightness and flexibility, and it is not intended to carry a stout, or heavy, sole. The use of a heavy sole will mean that the flexibility will be destroyed, and the sole stitches will break away during wear. Soles should therefore be selected of very light substance, and firm in texture. The most suitable material is the shoulder from a best quality English oak-bark tanned leather.

Preparing the shoe for the adhesive.—The original sole of the turn-shoe is of very light substance in practically all styles, and qualities, of these goods. The matter of roughing up is therefore a delicate one. Rasping too deeply near the edge of the sole will mean reaching the stitches, or so reducing the sole edge that the stitches have not sufficient sole leather material to grip, and they will break away, during wear, with the bend of the foot. Yet, the edge of the sole must not appear, in the finished job, to be stout or bulky. With the point of a very sharp knife, the extreme edge of the sole should be trimmed off at a level. The rest of the sole, all over its surface, should now be lightly rasped, and this procedure followed up by a scouring with coarse glass-paper, and the dust finally brushed away. The new half-sole should not be thinned, or skived, down at the waist, as with other shoes, but left at its full thickness.

The thinning down, in this case, is done after the sole is attached, as will be explained later in "Finishing." The process of roughing up the new sole, except so far as thinning down the waist is concerned, is as previously described. When applying the adhesive, three coats to shoe and new sole are advisable, as with the extreme flexibility of the shoe there is a greater pull, or strain, in wear than in other classes of goods.

Veldtschoen.—The new sole, in this case, has also to be placed on the top of the old. The stitches of the shoe, however, lie in a groove, or channel, on the surface of the sole, and not underneath, as in the case of the turn-shoe. For this reason, the preparing of the old sole for the adhesive is an even more delicate operation than in the case of the turn-shoe. The rasping, cutting, or weakening of the stitches has to be avoided. The method is as follows: For half-an-inch inwards from the edge of the sole the roughing up should be done with glass-paper. The glass-paper should be so manipulated that only the leather on each side of the stitches is touched, and not the stitches themselves. This can be done efficiently if sufficient care is used. The rest of the sole may be roughed up by means of rasp or hack-saw blade, as the soles used in the making of veldtschoen are usually of much stouter substance than those used for turn-shoes. In this case also, the waist of the new half-sole should not be thinned down, but left full, as described for the turn-shoe. Three coats of adhesive should also be used for boot and sole, and the sole selected should be left full so that, in finishing, the edge can be safely

trimmed away without cutting the veldtschoen sole edge. This is necessary, as the stitches are usually very close to the edge.

Riveted Boots and Shoes.—The removal of the old sole is best effected by lifting it up, at its weakest part, with the point of a small screwdriver, then gripping the part so raised by means of a pair of pincers, and pulling up the sole, all the way around, until it is released from joint to joint. The old sole is then cut across. Upstanding rivets, left in the middle sole, are next taken out. The waist of the old sole is next lifted up for about an inch and the rivets withdrawn. The waist is then tingled down, after it has been skived, or thinned in substance. The middle sole must now be examined to ascertain if it is solid. Sometimes the middle soles are fastened down separately; in other cases long rivets are used, and sole and middle sole fastened down together. In the latter event, the removal of the old sole means a loose, or insecure, middle sole. Such a middle will require to be secured with tingles of a sufficient length to penetrate the inner sole, and touch the last, or surface of iron foot. If the middle sole is of the loose variety the roughing up should be done before it is secured. If the middle sole is fastened down separately with rivets, or tingles, the heads of these should be slightly punched down with a centre punch. This will make the roughing up easier. Three coats of adhesive will probably be needed in the case of riveted boots. Apart from this, the rest of the procedure is the same as described for the machine-sewn boot with a middle sole.

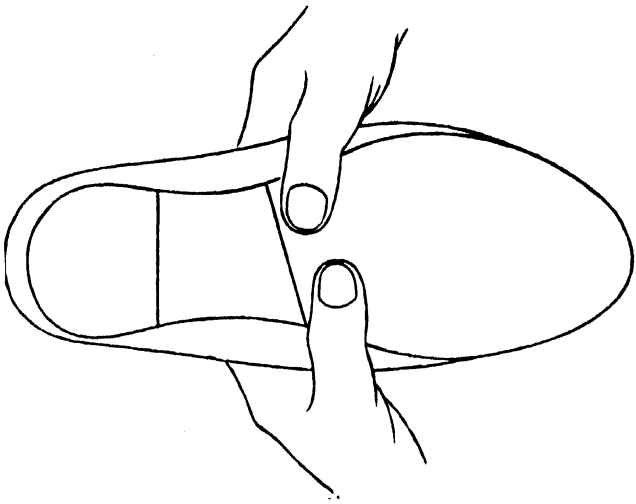
Screwed and Stitched Boots.—This type of boot appears to be a welted, or machine-sewn, boot until the outer sole is removed. Then it is seen that whilst the outer sole has been sewn on, the middle sole is fastened down with screws, the heads of which may be plainly seen on the surface of the leather. After cutting the sole across, the old waist is thinned and tingled down, and the process is then exactly as described for riveted work, except that the screws securing the middle sole must not be punched down.

Screwed Only.—The bottoms of this type are usually secured at one operation, that is, the outer sole and the middle sole are fastened down with the same screw. In stripping, or removing the old sole, some of the screws come up with it, whilst others are left firm and upstanding. The latter should be cut off close to the surface of the middle sole by means of the cutters, or nippers. The rough heads should then be filed level. The waist of the sole is then lifted up, screws pulled up with old waist removed, upstanding screws underneath clipped off, and the waist then thinned down and secured with long tingles. The procedure from then is the same as for riveted work.

Leather Substitutes.—This material is usually made with rubber as its binding content. This means that the attaching of soles of this material has to be treated in the same way as the attaching of rubber itself. The principal varieties are what is known as Itshide, Uskhide, Frevva, Dainite, etc., all very much alike in their constituents. The preparation of the boot itself is as described, but the soles will require a rubber solution. That is to say, if Xetal Stabilised

Rubber, or latex, celluloid, or mineral cements are used for the leather of the boot, these adhesives will not be effective in attaching soles of leather substitutes of which the binding content is rubber, or rubber soles of any description. A full rubber solution must be used for both boot and sole, or Xetal Stabilised Rubber, No. 13 solution, or latex may be used for the boot, and Xetal Rubber solution for the sole of leather substitute, or rubber.

Attaching Crepe Rubber Soles.—Soles of crepe rubber can be attached to welted, machine-sewn, turn-shoes, or veldtschoen by means of a good



Laying crepe rubber sole at waist.

rubber solution such as Xetal Rubber Solution, Stycco, Bateman's Securitas, or Holdtite, Sussex, etc. The preparation of the boots themselves is as described

for leather. The crepe rubber sole should be lightly scoured with glass paper on the side which has to receive the adhesive. Two coats of solution should be applied to the boot and three coats to the crepe rubber sole. When attaching, the crepe sole should be placed carefully in position at the waist, to start. It should then be gradually laid down, a little at a time, until the toe is reached. The shoe should then be placed on the last or iron foot and gently tapped down all over, using a wooden mallet. In every case care should be taken to get the sole in correct position before attaching, as it is almost impossible to adjust the sole once it is laid to the boot.

Ordinary Rubber Soles.—These are attached as for crepe rubber, but usually two coats of solution are sufficient. The same remarks apply to plain rubber soles, or soles cut from sheets.

Vulcanised Rubber Soles.—These are best attached by the following method. The boot is prepared, and given two coats of Xetal Stabilised Rubber. The sole is then scraped over its surface by means of an old safety razor blade. The sole is then slightly warmed at the fire, or gas jet, and a coat of Xetal Rubber Solution applied. Adhesives on both boot and shoe must be allowed to dry thoroughly. A second coat is then given to each, and again allowed to dry. A third coat is now given to the rubber sole and allowed to dry. Before attaching, the adhesives on both boot and rubber sole must be absolutely dry.

Attaching Rubber to Rubber.—If the boot already has a rubber sole made as part of the boot as in sports goods, the old rubber sole should be thinned

down and nicely levelled. A sharp knife should be used, and the blade frequently dipped in water during the cutting. It will then be found that the rubber will pare quite easily. Usually one good coat of rubber solution will be sufficient in these cases.

Soling Rubber Wellingtons.—This is more difficult than other forms of rubber sole attaching in so far as the boot itself is concerned. With a sharp knife, dipped frequently in water, the old sole of the boot should be carefully levelled. It should then be scoured with glass paper. Next, the sole should be washed in a solution of common soda and water, hot. The boot is then allowed to dry, and slightly warmed before the fire. A coat of Xetal Stabilised Rubber should then be given to the boot, and one to the rubber soling material used. Both coats must be allowed to dry. Two more coats must follow to boot and new sole, and allowed to get bone dry, when the attachment can be made. Either crepe soles may be attached, or other rubber soling. If it is to be a crepe sole, the surface must be scoured. If other rubber soling material, a slight scraping with an old safety razor blade is the best.

Attaching Thick Felt Soles.—These are attached in the same way as leather to leather, except that no preparation of the felt sole is required. Either Xetal Rubber Solution may be used, or any one of the various good solutions mentioned. Three coats should be used on the felt sole owing to its absorbent qualities, and a thick solution, such as Securitas, is the most suitable for the felt itself.

CHAPTER III

Welted Work: Hand-sewn

IT has been explained in other pages how boots and shoes may be distinguished in their different styles of manufacture. When not repaired by the adhesive process, welted goods should be repaired by the hand-sewn process, attaching the soles by means of waxed threads.

The important details in this class of repairing are, the selection of suitable sole leather, the proper tempering of the leather, the suitable strengths of the waxed threads, with their correct preparing, and the right type of sewing awl.

The Soles.—It is wise to deal first with the matter of the soles as, if these are cut from unsuitable leather, and are not properly tempered, all the care taken with the waxed threads and the sewing awls will be useless. Leather that is quite suitable for riveted work is not always suitable for hand-sewn work. The leather for the latter class of work must be mellow and pliable, to permit of the necessary channelling, a detail which will be explained. Leather that seems firm or harsh should be rejected for hand-sewn work, though such leather is quite suitable for riveted work. If cut-to-pattern soles are used, operations are some-

what simplified, but if the worker is cutting from a square, or similar piece of leather, he should, first of all, strip off the old sole from the boot, and skive down the waist in the usual way for the adhesive process. The piece of leather should then be laid flat, grain or polished side uppermost. The boot is now placed upon the leather in a position that will make the least waste of material, and a pencil drawn around the forepart close to, and along by, the edge of the welt, all round from waist to waist, reaching, in the waist, just so far as the old waist has been skived, or thinned, down. The sole is next cut out by the line made, and the second boot placed on the leather, the leather still being grain, or polished, side uppermost, and the operation repeated for the second sole. Should there seem, however, to be any inequality in the width, or shape, of the soles of the two boots, the marking around by the welts on the leather should be done on the reverse, or flesh side, of the leather, or the widest sole will have been cut for the narrowest boot. This will be obvious, as the soles are always put on the shoes with the flesh side next to the welt, and marking round on the grain, or polished, side is only done to get a clearer pencil impression of the pattern to be cut.

Tempering the Leather.—This is important, as it means just the difference between easy and difficult sewing. If the leather is not properly tempered it will not bed, or mould, to the shoe as it ought to do, and unless the sole is bedded, or moulded, properly to the shoe there is extra strain on the stitches, and this will mean the stitches breaking during the wear

of the shoe. Further, improperly tempered leather injures the sewing threads, stripping off the wax, and causing the threads to fray. The soles, after being cut, should be placed in a bucket of clean water, and allowed to remain there overnight. The next morning they should be removed from the water and placed in a slanting position against the wall, and left there all day to drain off and become mellow. The soles should then be worked by bending them backwards and forwards several times. They should then be in the properly tempered and workable condition for solid and easy sewing. The waists of the new soles should then be skived, or thinned, down on the flesh side to the same measurement as the waist of the old sole. It will be noticed that the flesh side of the leather has a loose appearance, and this loose flesh should be lightly skived off, using a keen-bladed knife. The sole is then ready for temporarily attaching to the boot, previous to channelling and sewing.

Tacking on the Sole.—The sole should now be placed in correct position at the waist, and a rivet driven through at each corner, and one in the centre at the edge of the waist. These rivets should be just long enough to go through and touch the surface of the last, or iron foot. The toe of the sole should next be taken between the finger and thumb of each hand, and pulled tightly forward. This is termed " taking out the stretch " of the leather. A long rivet should now be driven through at the centre of the sole, near the toe, but left standing sufficiently to be able to be withdrawn later. This completes the operation of tacking on.

Rounding Up.—The next operation is rounding up, and is carried out in the following way. First of all, additional rivets are driven across the waist to complete the row The boot is now held in the left hand, the thumb pressing the sole down to the welt. The surplus leather of the sole, extending beyond the edge of the welt, is trimmed off in a close and straight cut, close to the edge of the welt, all the way round the sole. The thumb is moved, and the pressure maintained, as the cutting progresses. Care must be taken to keep the blade of the knife as square as possible, or it may be found that the sole is trimmed on the slant inwards towards the centre of the sole.

Channelling the Sole.—The rounding having been accomplished, the next detail is the important one of cutting the channel. The knife required for this operation needs to be of a special pattern. Such a knife can easily be fashioned by the worker in the following way: A small shoemaker's knife should be obtained, and the blade snapped off about one inch from the handle, or haft. The end of the blade should now be rubbed on its broken edge on a stone, in such a way as to make it half-round in shape. The rounded part should now be well sharpened. This converting of the ordinary knife to a channelling knife is a very simple matter if a small grindstone is in use, but, if not, rubbing on a flat piece of stone will serve. To start channelling, the rounded edge of the knife should be held upright, at an angle of forty-five degrees, on the sole, and quite close to the edge. At this angle the channel will slope in towards the centre of the sole, which is necessary. The haft of the knife

should be held tightly between the thumb and the forefinger, the thumb pressed close to the side of the blade with, at the same time, pressure of the thumb on the sole, and the forefinger pressed tightly against the edge of the sole. If this is done correctly the cutting can be kept at a perfectly equal distance from the sole edge. When the cutting is started, it should be endeavoured to cut all the way round the sole before removing the knife, and to keep the pressure even, so that the channel may be cut at a uniform depth all round the sole edge. The pressure should, however, be eased at each side of the waist, so far as it has been skived, or the blade will cut right through the leather. The channelling of the toe of the sole may be found to be a little difficult, but that may be overcome in the following way. The toe of the boot must be gripped by the left hand, upper of the toe, or toe-cap part, resting in the palm of the hand, and the fingers meeting the thumb on the surface of the sole. Then, the toe should be gradually turned as the cutting is being done, and a clean cut will result.

Opening the Channel.—The channel has next to be opened out in the following way. The point of a small screwdriver is inserted in the cut, at the commencement of the waist, and the screwdriver is pulled steadily around the sole edge. This will lift up the face of the leather inside the cutting line. The leather so lifted up is termed the lip. With the knife haft, this lip should be turned back towards the centre of the sole as far as possible. This is to prevent it from being caught with the threads when sewing.

It is a good idea, now, to rub a little tallow in the channel all the way round, to assist the threads in passing through the channel when sewing.

The channel should be cut at a depth of about half the substance of the leather, unless the leather is on the soft side. In that case, the channel should be cut a little less deep, as the tight pulling up of the waxed threads will sink the stitches to the rest of the depth required in the leather, but if the channel is cut too deep on soft leather the stitches may pull right through the leather in the base of the channel. The idea of the channel is to accommodate the stitches below the surface of the leather, and the lip is to cover the stitches from sight, and wear, when it is replaced in its original position.

If very light leather is being used it will be necessary to hold the knife at a greater angle, or slant, and to cut more forwards, and less direct downwards, than in the case of heavier leather, otherwise sufficient accommodation cannot be made to get the stitches below the surface of the leather.

The Sewing Threads.—The sole having now been cut out and tempered, skived and fleshed, tacked on, rounded up, and channelled, the next operation is the preparation of the threads. For this, a ball of hemp, a piece of shoemaker's wax, and a few bristles are required. The length of the threads will need to be about three feet, and the substance is regulated by the number of strands of hemp used in making the thread. For a stout sole, eleven strands will be needed; nine strands for a medium sole and seven strands for a light sole. These are the average substances of

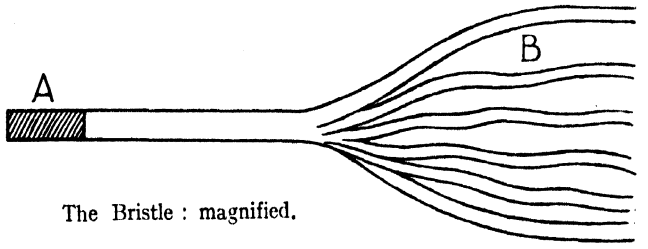
threads used, but for extra heavy soles the strands would require to be increased to thirteen, and for extra light reduced to five strands.

Making the Threads.—In making the threads, the following is the procedure : Place the ball of hemp in a tin, with a hole made in the lid which will allow easy passage of the strand of hemp. Place this tin on the floor, to the right hand. Take hold of the end of the hemp with the fingers of the left hand and draw out, over the knees, about a three-feet length. Place the palm of the right hand over the right knee, the hemp being underneath the palm. A few inches away, take hold of the hemp with the left hand. Next, slide the right hand palm forwards over the knee, keeping tight hold of the hemp in the left hand. This will slightly twist the thread. Draw back the right hand palm, and repeat this operation three or four times. Then, ease the right hand a little and, at the same time, give a sharp pull, or snap, of the thread with the left hand. The thread will break and leave a "fluffy" end. This is what is required. The fluffy end is necessary for making a tapered end to the waxed thread, as will be seen. Next, place the end of the severed strand an inch beyond the end of the ball strand. Draw out the next length, letting the hemp run through the fingers along with the detached strand. In this way, the severed strand acts as a guide for the length of the next strand. Roll and snap off as before, but half an inch longer. Continue in this way, making alternate differences in length of strands of half an inch to one inch. The object is to get the threads of slightly varied lengths. Having

got the needed number of strands for the thread for the job, take a piece of clean rag, moisten it with water, and draw this along the whole length of the strands several times. It will be seen that the operation draws loose fluff from the strands. This will help in the better waxing and working of the thread. Next, hold the thread at the middle in the left hand. Take the piece of wax in the palm of the right hand, and stroke down each half-length of the thread briskly with the wax. To prevent the wax sticking to the palm of the hand place it in a small piece of brown paper, leaving just enough of the wax exposed to lay on the thread. When the thread is well waxed, so that no unwaxed strands show up, twisting of the thread has then to follow. Still holding the thread at the middle of its length, lay one length over the knee. Place the palm of the right hand over the thread, keeping the left hand tight, and roll the thread forward several times. Then open the left hand, holding the end of the thread with the right hand, and the twist made will spread along the whole of the half-length of thread and adjust itself. The second half of the length of the thread is next treated in the same way, and the tapered ends are then separately twisted, and lightly waxed. The next operation completes the making of the thread.

Attaching the Bristles.—This has to be done very carefully or the fine tapered end of the thread, made possible by the varied lengths drawn out, will break during use, or the thread may ruck up, or bunch, on the bristle, or the bristle come away from the thread during the sewing. Examination of the bristle will

show that one end is solid, or whole, and the other end is split into two or three sections of hair. It is to this split end that the end of the waxed thread must be attached. There are three methods open to the worker to choose in attaching the bristle, and opinion is divided as to which is the best of the three. One is to roll the tapered end of the thread around the split bristle end. Another is to place the tapered end of the thread between the splits of the bristle, before rolling, and the third method is to remove one of the split hairs from the end of the bristle, then insert



The Bristle : magnified.

(A) Sewing end. Shade portion shows soft end of bristle which should be cut off. (B) Split end of bristle to which is attached the tapered end of waxed thread.

the thread end, and roll the bristle end around it. The best method, however, is generally considered to be the following, as, if done properly, it will prevent rucking up of the tapered end of the thread, and there will be little risk of the bristle leaving the thread during use. Place the end of the tapered thread between the split in the bristle, allowing it to protrude a quarter of an inch. Twist the thread around the bristle a few times, upwards towards the solid end of the bristle. Next, twist the bristle round, and

continue rolling the thread end around the bristle until within a quarter-inch of the end of the split. Next, just below the end of the bristle, pierce a hole through the thread. Then insert the solid end of the bristle through this hole and pull right up. This is what is termed, in the trade, locking the thread, and, though there is no knot, it secures the bristle firmly. At the solid end of the bristle, about a quarter-inch will be seen to be of a different colour to the rest, usually white. This end of the bristle should be cut away, or it will go soft during the sewing and cause the rest of the bristle to split. Remember that the thread has to have a bristle at each end. This done, the thread is ready for use. Just a detail should be noted as to the wax. In cold weather this may fly during the waxing of the thread. In that case it will be useless to continue the waxing of the thread without first giving attention to tempering the wax, otherwise the thread will be stripped of the wax as it passes through the leather. The wax is tempered by first warming it at the fire, then rolling it between the palms of the hands, and then pulling it. It will then become pliable, and ready for use.

The Sewing Awl.—There are two kinds of awls, sewing awls and stitching awls. The sewing awl blade is of round shape, and the stitching awl of square shape. The stitching awl cannot be used for hand-sewing, as the action of using the stitching awl is different to that of the sewing awl; and work, and threads, are also prepared differently, as will be shown later.

The size of the sewing awl blade is regulated by the

substance of the thread it is intended to use. The point should be large enough to make a hole that will easily allow the passage of the bristle. The bend of the awl point should be of a thickness that will permit a hole to be bored that will allow the passage of the two portions of the thread by tightly pulling up only. Any easier passage of the threads than this means that the awl blade is too large for the thickness of the thread. That means loose stitching that will not hold in wear. The awls can be had in styles ranging from those with very pronounced bends, or what are termed shoulders, to the almost flat type. The handiest awl is one of rather short length, and only slightly curved at the shoulder. With an awl of this type the average job can be done efficiently. Awl hafts can be obtained with a screw cone end, which permits very easy removal and replacement of awl blades, and these hafts are much better than the old pattern into which the awl blade had to be hammered, as the blade can be set more straight, and in proper alignment.

Sewing the Sole.—The worker is now ready for sewing on the sole. Place the boot between the knees, sideways, so that the heel is farthest away, and the welt side of the shoe to the right hand. The sewing is commenced an inch or so below the edge of the waist of the new sole. Push the point of the awl through the welt and waist here, just far enough to see the tip of the point protrude. Insert one of the bristles, and pull the thread through to half its length. The sewing proper now commences. Insert the awl blade a quarter-inch farther on, put the left hand bristle through, then the right hand bristle, take

hold of each bristle and pull them gently until the tapered end of the thread is well through, then give a stronger pull and, pulling the two halves of the thread with equal tension together, draw up the whole of the length of the thread. Continue in this way, at quarter-inch distances, until the skived portion of the waist of the new sole is passed. Then make the distance of the piercing for the stitches one sixth of an inch, or in other words, six stitches to the inch. Sew round the sole until the opposite joint is reached, then revert to four stitches to the inch, and finish up an inch beyond the edge of the waist of the new sole, and cut off the threads.

Before starting the sewing, it is wise to examine the best position for placing the point of sewing awl on the welt. This is behind the old stitches of the previous sole, that is, nearer the upper. It is best to keep to this position as, if the sewing is done on the previous stitching line on the welt, chafing of the thread by the old stitches will result, and the new stitches will not lay so even, and level, as they should. An assistance in pulling up the stitches is what is termed the hand-leather. This is made by cutting a piece of stout upper leather in such a way that it will go over the back of the hand and the palm, a hole being made to pass the thumb through. The two ends of the leather are sewn together, and the result is a sort of mitten. To pull up the stitch tightly, the thread should be wrapped round this hand leather over the left hand, and around the groove in the top of the awl haft in the right hand, when nearing the end of the lengths of thread.

At about every third stitch, both sections of thread should receive a rub with the piece of wax. This will assist in easy sewing, as well as keep the thread from fraying, or burning with the friction of being pulled through the leather.

The stitches now being in the sole, the next operation is to lay back into correct position the lip of the channel, and to level down the sole.

Laying the Lip, or Closing the Channel.—Putting back into its place the lip of the channel is termed channel laying, and must be done carefully so that it will not rise again during wear. If it so rises, quite apart from any risk of possible injury to the exposed stitches during wear, the lip will get broken away, and this will tend to rapid wear of the edge of the sole at that point. It is usual to paste the channel down, and, for this purpose, any of the adhesives mentioned in the earlier pages will be suitable. Failing this, a rye flour paste may be used. The channel should be filled with this, the lip turned into place over it, and laid, by the use of the hammer shaft. The hammer shaft, or bottom stick, is then placed flat across the channel and rubbed with pressure all round the sole. The sole is then tapped down lightly around the edge. (A bottom stick is a short length of boxwood, round and smooth.)

The sole is now ready for trimming up, and finishing, as is detailed in another chapter of this book.

Hand-stitching.—As previously mentioned, this differs from hand-sewing, a square awl being used. In preparing the channel for stitched work, it is cut less on the slant, and not so deep as for sewing. The

square awl permits very much closer stitching than does the sewing awl, and the threads are made a couple of strands lighter, and are more tightly twisted, than they would be for a sewn job. The action of the stitching awl is that of a straight forward thrust. The awl should not be turned, or twisted, during the piercing, or boring, or the blade will snap.

Other details of attaching the sole are the same as for hand-sewn. Ease in sewing, or stitching, through welts is much facilitated if, after the old sole has been removed, the shoe is placed in water of a depth just to cover the welts, and allowed to remain there for half an hour. The welts should then be allowed to partly dry off, and then be opened out by placing the knife handle, or a dull rasp, between the welt and the upper, and gently forcing the welt out. This will allow the sole edge to bed to the welt better. If the welts have turned in at the toe, or overtrodden at the joint, this operation becomes very necessary.

A Grafted Waist.—The ambitious worker may prefer to make what is termed a grafted waist. By this method the new sole is made to fit the old waist, without rivets, and leaving a perfectly smooth waist surface giving the appearance of the original waist, or uncut waist of the boot.

This operation is performed as follows: When the old sole is cut across, the knife is held perfectly upright to get a square cut. The waist of the new sole is not skived down, or thinned, but left at its full substance, and shaped to fit closely the waist of the old sole. What is termed an inseam has next to be made, on the underside of both the waist of the old

sole and that of the new. This is made by first making a mark across the waist of the new sole, a quarter of an inch from the edge. The knife is then held upright on this line, and the leather cut through to half its substance. A line is next made, a further quarter-inch back, the knife blade held nearly flat on this line, and a cut made at a slant that will end at the depth of the cut made previously. The leather so cut may now be removed, and it leaves a cavity. The waist of the old sole is prepared in exactly the same way, and then, turned back, it is next fastened down to a piece of wood with a couple of rivets. The new sole is placed in position to meet it, fitting the two edges tightly together, and also tacking down the new sole to the board. A stout thread is now selected, the awl bored through the ridge made in the waist of the new sole in such a way that it passes through the waist edge at the centre of its substance, proceeds through the edge of the old waist at its centre of substance, and through into the cavity of the old waist. The thread is then passed through to half its length, boring done as before, and the sewing proceeded with through the two waists as if in sewing on a sole. The threads are then cut, rivets are withdrawn, and the old and new waists are joined as one. The sole is pulled forward and tacked on at the toe, and the waist tapped down over the seam. The channelling of the sole is next done, and the work of sewing, or stitching, the sole proceeded with as has been described.

It is very necessary, before starting to sew the grafted waist, to see that the new sole is in correct position, so that, when the waist is sewn, the sole is

not overhanging at one side of the joint and short at the other side. It is wise, if a grafted waist is to be made, to cut the soles rather full in the matter of width. The waist of the old sole will require the stitches releasing a little way back to allow the waist to be turned back sufficiently to permit handling easily during the preparation of the graft.

CHAPTER IV

Hand-sewn Work: Various

Machine-sewn Shoes.—It is possible for the worker to attach the soles to this class of shoe by the hand-sewn method, as is frequently done in regular repair shops. If the shoe has a middle, or under sole, after the outer sole is removed, short tingles, or tacks, should be driven around the middle sole a quarter-inch from the edge, and a quarter-inch apart. These should be long enough to penetrate the middle, and inner sole, and clinch on the last. The waist of the old sole, after being skived, or thinned down, must be treated in the same way in regard to fastening down with tingles. The operation now proceeds as for hand-sewn. It is well, however, that the channel shall be cut a little farther inwards than in the case of a welted boot, and an awl with a shallow, or nearly straight, shoulder, or bend, should be used.

If the shoe does not possess a middle sole, but is of the variety previously described as single-soled, it will be treated in the following way. Using a coarse rasp, the whole surface of the sole is thinned, or rasped, down to a light substance, and equal in the reduction of its original substance all round the edge. The sole is now secured, as described, by means of tingles, the sole placed on top, and the sewing done through the edge of the old single sole.

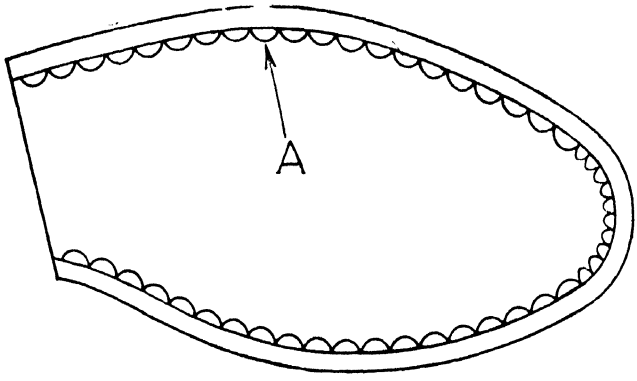
Veldtschoen.—This class of shoe is frequently re-soled by the hand-sewn process. The surface of the old sole is rasped down to reduce the substance. Care must be taken that this rasping is not overdone. If too much of the sole is rasped away, the edge of the upper will lift from the edge of the sole. After attaching, and channelling, the new sole, the stitching, or sewing, should be done well behind the original stitches of the shoe. The channel for the new sole must be cut well forward for this class of work. The waist of the new sole is best secured by tingles, in place of rivets, as in this shoe there is no intervening inner sole, shank piece, or packing to receive the rivets. Tingles will hold the two waists together in the most secure way, and these should be thoroughly clinched on the inside by hammering down the inside of the waist as well as the outside.

Turn-shoes, or Pumps.—When not treated by the adhesive process, this class of shoe is usually repaired by the hand-sewn method, of which there are two styles. In the first, the edge of the pump sole is lightly and carefully skived down. The new sole is cut a quarter-inch wider than the pattern taken from the pump sole. The channel is cut well forward, and also cut deep, as the leather will permit, so as to thoroughly sink, or bury, the stitch. There are two reasons for this. First, only a light thread must be used for this class of work, and the stitches must not be put in as closely as for other hand-sewn work. This is so that there shall be as little disturbance of, and strain on, the pump stitches as possible. The

sewing awl should be placed well in between the edge of the sole and the upper. The action of sewing under these conditions takes in the original sole a little, hence the reason for the new sole being cut rather full, so as to provide a sole edge in finishing, and also to protect the pump edge of the original sole.

The second method is more intricate; the idea is to take the strain of carrying the new sole away from the original pump stitches, and provide a separate means of carrying the new sole by utilising the upper. This is accomplished as follows. First of all, a waxed thread is made of, usually, five strands. The worker then proceeds to loop-stitch the upper. An awl with a medium bend, or shoulder, is used for this work. Starting well down in the waist, and placing the awl point on the upper, well in between sole edge and upper, and the awl point towards the toe of the shoe, the awl is pierced through the upper, then, before withdrawing, the awl is tilted and brought back through the upper a quarter-inch forward. The awl is then withdrawn, leaving two awl holes in the upper. The bristle of the thread is next inserted in the first hole made, and brought out at the second hole, and the thread pulled up to half its length. The awl is again placed immediately behind the second, or farthest, hole previously made, and the upper pierced exactly as before. The second, or near, bristle of the thread is now inserted and brought out at the farthest hole, and this will leave a loop, or stitch, on the upper. This process is repeated all round the shoe to the opposite waist side, the final boring being through the pump sole, the threads passed through,

tied, and cut off. The stitches thus put in the upper must be slack. This is very necessary, as will be explained. The sole is now tacked on, and channelled, as previously described. The sewing is started a quarter-inch below the first loop-stitch. A couple of stitches are put in, and then, for the next stitch, the awl is inserted under the loop-stitch, and pushed through the pump sole and the channel of the new sole. In placing the bristles, the outside bristle is



Forepart of Turn-shoe.
Showing (A) Edges of upper lasted over the inseam of the inner sole.

placed under the loop-stitch, the bristle from the channel side is made to come under the loop-stitch also, and the threads pulled up. This is continued all round the sole until the sole is sewn on. If the loop-stitches are properly left a little slack, or loose, it will be found that the loop-stitches have been pulled out of sight in sewing on the sole. The outer sole, as will be seen, by this method is secured to the shoe in a manner quite apart from the original stitches of

the shoe, and upon which there is no strain in carrying the new sole.

If difficulty is experienced in placing the loop stitches in the upper, in the manner described, the following is an easier, though a rather slower method. The sewing awl is pierced through the upper to the inside of the shoe. The bristle is then forced through, the hand inserted in the shoe, and half the length of the thread is pulled up. The second hole is now pierced, the second bristle inserted, the hand placed in the shoe and this half of the thread pulled up. A hole is now bored through the thread itself, the first bristle is placed through this hole, and the thread is pulled back again to the outside of the upper until the bristle it carries appears. The bristle is now withdrawn from the hole in the thread, with the result that one bristle end is inside the shoe, and the other outside. The inside and outside threads are now pulled up, and the operation repeated all round the upper, loop-stitches on the upper resulting. This is termed leading the stitch, and is the strongest method of putting loop-stitches in the upper.

Leather Substitutes.—Soles from such materials as Itshide, Uskhide, or other well-known leather substitutes, may be hand-sewn in conjunction with the adhesive process. First, the welt, or middle, or original sole is roughed up by means of the rasp, and the under surface of the substitute well scoured with coarse glass-paper. A coat of rubber solution is then applied to each, and the sole first attached by this method. After the sole has set, and been rounded up around the edge, the surface has to be treated for receiving the

stitches. This material cannot be channelled, but has to be sewn by the method known in the trade as sewing aloft. A mark is made around the edge for what would otherwise be the channelling line. The knife is then held upright with the point on this mark, and pulled along the mark, around the sole, with pressure enough to make an incision one-sixteenth of an inch deep. The point of a fine screwdriver is next inserted in this cut, and pulled round the sole with pressure. This will open up the cut, and form a groove into which the stitches will be placed. As the nature of this material causes the hole bored by the awl to close up on the withdrawal of the awl, on account of the rubber content of the material, ordinary bristles cannot be used with the threads. Ready-made waxed threads can be obtained, fitted with needles instead of bristles. After boring with the sewing awl, the threads can be got through by means of the needles, providing the welts are wide, and the groove of the sole is near to the edge. If, however, the welts are narrow, and the sole channelled a little way in, the needles will be useless on account of the angle of the bored hole. This difficulty is met in the following way. Instead of the usual bristles very fine wire, such as is used for making artificial flowers, is employed. Short pieces, as the length of a bristle, are used, and the tapered end of the thread is attached exactly as a bristle is attached. This wire end will bend to the angle required, and, being firm, will find its way through the hole in the substitute sole. When the stitches are in there is not, of course, any channel to be closed up, but it is a good idea to fill up the groove

with thick rubber solution and let it set. Afterwards, the bottom stick, or hammer shaft, is rubbed briskly around the sole over the grove.

Screwed and Stitched.—This class of boot is made by the under sole being screwed on separately from the outer sole. The outer sole is then stitched on, by machine, through the edge of the under sole which acts as a welt. This type of boot is easily re-soled by the hand-sewn method, the procedure being as described for welted hand-sewn work.

Screwed-through.—This boot is made by the screws being put through the outer sole and middle sole. The outer sole is lifted up, cut off, and the upstanding screws cut off, close to the surface of the middle sole, with sharp cutters. The boot can then be re-soled, hand-sewn, in the same way as the screwed and stitched type.

One point is necessary to observe with these two lines of manufacture, if they are to be re-soled, hand-sewn. Usually, the middle, or under sole is of very hard material. The middle should be softened with water, and the sewing holes bored around the edge before the new sole is attached. Then, when the new sole is fixed on, and channelled, the same holes are followed in the sewing. This makes the work of the awl much easier than if boring is done in the usual way.

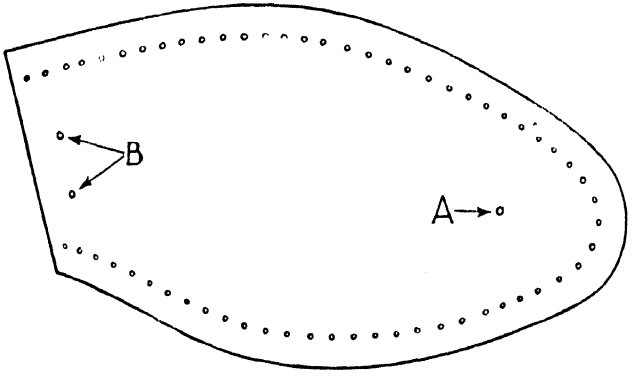
CHAPTER V

Riveted Work

Single-soled Shoes.—In repairing machine-sewn shoes of the single soled variety by the riveted process there are two methods open. One is to again make the shoe single-soled, and the other method is to place the new sole on the top of the old, or original, sole. If a single sole is decided upon, the stitches of the old sole are cut, as described in the earlier pages, and the waist thinned down. Each side of the waist is then tingled down securely. The sole is cut full, as, in riveting a single sole, it is apt to be drawn in a little; marking round the sole for the riveting line must be done carefully. The upper will be noticed to be fastened to the inner sole by means of tingles. The riveting line should be made on the new sole in such a position that it comes between these tingles and the extreme edge of the shoe. In tacking on the sole, it should be placed carefully in position at the waist, and a couple of rivets placed there, first of all. The sole must now be pulled forward tightly, and a rivet placed at the toe. The sole is now rounded up, a guide given by pressing the sole down to the upper with the thumb of the left hand whilst the cutting is being done. As previously stated, the sole must not be rounded too close up to the upper. After rounding up, the riveting line is drawn, as explained, and a rivet driven at the

outside joint, one at the inside joint opposite, and a rivet at each side of the toe.

The riveting proper now starts at the joint rivet, continued around the sole to opposite waist corner, then from the other waist corner to the original starting point, and, finally, across the waist. Beyond the one rivet at the centre of the toe no other rivets should be placed inside the riveting line. It is important that the rivets should be held at a slant



Riveted Forepart.
Dotted line around edge is the riveting line. (A and B) Tacking on rivets.

towards the centre of the sole, when driving. If they are held straight up there is a risk of their turning outwards towards, or through, the upper. The length of rivets should be just sufficient to pass through the sole and inner sole, and just touch the last, or hobbing foot. The sole is then hammered down, starting on the riveting line, round the sole, then outside the riveting line to close up the edge, and finally levelling down the surface of the sole within the riveting line.

The size of rivets usually suitable for the single-sole repair of medium substance sole is seven-sixteenths of an inch. Stouter material will take half-inch and very light material three-eighth rivets. The inner soles of some shoes are, however, stouter than others, and this has an effect upon the size of rivets needed, no matter what substance of outer sole is used. It is, therefore, very advisable that the job should be tested for size of rivets required by examining the result of the tacking-on rivet. If the point of this cannot be seen on the inner sole, a shade longer rivet should be tried. If the tacking-on rivet is seen to be curled on the inner sole, then a shade shorter size must be substituted. If the riveting line is marked too far in on the new sole the rivet points will strike the heads of the tingles, and the riveting will, in consequence, be ineffective, whilst if the line is too near the sole edge the rivets will miss the edge of the inner sole, and will turn outwards through the upper, or protrude between the edge of the inner sole and the upper inside the shoe.

Machine-sewn Shoe with Middle Sole.—This type of shoe is much easier to repair by the riveted process than is the single-soled shoe. After the outer sole is removed, the middle sole is next tingled down. The tingles should be so placed that the riveting line can be made on the new sole to permit the penetration of the rivets between the tingles and the edge of the inner sole. When the sole is tacked on, it should be rounded up with the middle sole as a guide, and it should be cut close to, and square with, the edge of the middle sole. After this, the procedure is as previously described.

Riveting a Welted Boot.—It is usual, when a welted boot is too far worn to be worth re-soling by the hand-sewn process, to rivet a sole on the top of the old sole. This is rasped down and made level, and the new sole is cut out a little wider than the pattern of the old sole. Short rivets should be used, and placed closer together than for ordinary riveted work. The riveting line is decided by the width of the welt of the shoe. That width should be fully allowed for, and the line marked a quarter-inch beyond that distance on the sole.

If the old sole has to be removed, and the new sole riveted on the welt itself, the work is a little more difficult. After the old sole is removed, it will be found there is packing of felt, or cork dust, or similar material in the centre of the shoe. If this is lifted up, it will be seen that there is a ridge on the inner sole to which the edge of the upper and the welt have been sewn. This ridge is termed the inseam. It is the real foundation of the boot. When the sole is tacked on, and rounded up, it is necessary that the riveting line shall be placed in such a position on the new sole that the rivets will penetrate the ridge, or inseam, referred to. If the rivets are to the outside of this inseam, they will pierce either the welt or the edge of the inner sole between the welt and the inseam. In either case, the work will not be secure, and it will not be possible to close up the edges of the welt and the sole together. If the riveting line is properly measured, the rivets will penetrate the inseam, which is the full thickness of the inner sole, and reach the surface of the last to be clinched. The work will then

be solid, and the welt and sole edges will close up properly when the sole is hammered down. When the old sole is removed from the welt, it may be found that the welt has, at some point, broken away from the inseam. This will require to be repaired before attaching the sole, and the operation is dealt with in another chapter.

Riveting a Turn-shoe.—This method is sometimes employed in re-soling a turn-shoe, except that, instead of rivets, tingles are used for attaching the new sole. The extreme edge of the sole of the turn-shoe is rasped away, and the new sole is cut a little wider than the original sole of the turn-shoe. After the new sole is tacked on, and rounded up, the riveting line is made a quarter-inch inwards from the edge of the sole, allowing that the new sole has been cut one-eighth inch wider than the turn-shoe sole. As stated, tingles are used for attaching, and these are not driven flush with the surface of the sole, but left upstanding. The heads are then cut off flush with the sole, using sharp cutters, and the tingles are then tapped down. When this is done there will be scarcely any trace of the tingles on the surface of the sole. The length of tingles selected will have to allow for the shortening by the cutting. In the inside of the turn-shoe will be found a sock, and under this a quantity of padding, or stuffing. Such of this as is loose should be removed, until the sole has been attached, and then replaced by pasting in. The tingles used should be of a sufficient length to penetrate through to the inside of the shoe after the packing is removed. Should they be a shade too long, it will not matter, as tingles will clinch and

flatten better than rivets, and the pasted-in packing will cover any roughness caused by the tingles.

Riveting Veldtschoen.—This type of shoe may also be re-soled by clumping, and the use of tingles, as described for the turn-shoe, with this difference. No rasping of the sole of the shoe must be done as this will weaken, or destroy, the stitches which hold the upper and sole together. It is a different matter in the case of hand-sewing the sole on, for if the stitches are then weakened new stitches take their place to hold the component parts together. Tingles, however, cannot do this, so the sole of the shoe must be left untouched. The riveting line will have to be placed a fair distance inwards on the sole to ensure their penetrating to the inside, otherwise they will come out on the welt side of the shoe. There is no packing in this type of shoe, so that the tingles selected must be of exact length to penetrate the two soles, and just touch the last. This is very important in this type of shoe. In this case also, whilst tingles are more suitable than rivets, the heads must not be cut off, but the tingles driven flush. After the sole has been attached, and hammered down, the shoe should be placed bottom downwards on the last, or hobbing foot. The welt should then be tapped down by means of a small-headed hammer. To do this, the shoe should be slightly tilted on the last so that the extreme edge of the sole rests solid whilst the tapping of the welt is being done. This will close up the edges of old and new sole, and the operation will be assisted if the edges are moistened with a sponge previously to the tapping down. The rasp should then be run

around the sole edge whilst the edge is still damp.

Screwed and Stitched Work.—The boot which is made by the process of a screwed middle sole, and stitched outer sole, is perhaps the easiest style of boot to re-sole by the riveted method. When the sole is removed, the only detail needing special mention is that the marking line must be made on the new sole at a distance inwards that will ensure the rivets from meeting the obstacle of the screw heads on the middle sole. The riveting line should be in a position to allow the rivets to penetrate on the inside of the screw line. If this is not done the rivets will double up under the sole, or come out in the welt.

Screwed-through Boots.—This is rather more difficult than the preceding type to repair by the riveted process, although it is the proper process for this class of shoe. When the sole is lifted, and cut across, it will be found that the screws are upstanding on the middle sole. These should be cut off as closely as possible, and then the file rubbed across them. The same remarks apply to the screws upstanding in the waist, when the waist is lifted, but it will sometimes happen that the screws are pulled up with the waist. These should be removed entirely, and the waist skived and tingled down. Sometimes it is found to be very difficult to lift up the waist. In that case the following method is adopted. A mark is made across the waist at the point it is intended the waist of the new sole shall reach. The edge of the file is applied to this line, and an impression made. The waist is next skived within that line and as near to the screw heads as can be got. The file is then applied to the screw heads, and the

edges of the waist, and the same reduced to requirements. After this operation, the only special detail to watch is the placing of the riveting line on the new sole, to avoid the screw heads of the middle sole.

Ordinary Riveted Boots.—The repairing of these is similar to that of screwed boots. There are two types of riveted boots, one having the middle soles fastened down separately, and the other having both the outer sole and the middle sole attached with the one rivet. In the former case, all that is necessary, after the sole is tacked on and rounded up, is to see that the riveting line is kept clear of the rivet, or tingle, heads of the middle sole. In the case of the boot in which sole and middle are attached with the one rivet, the middle sole must be securely tingled down. Sometimes it will be found difficult to get the rivets from the waist, preparatory to skiving. The waist should be lifted up, which will bring up the rivets, and a rasp, or file, placed under the rivet points. The waist should then be tapped with the hammer, and this will release the rivets so that they can be withdr. 'n by the heads. After this, the process is as previously described.

CHAPTER VI

Re-soling Turn-shoes. The Turning Method.

THE correct method of repairing the turn-shoe is essentially a hand method of re-turning the shoe on the same lines as those by which it is made, and hand-sewing the parts together.

Releasing the Stitches.—The first operation is to release the stitches by which the sole and the upper are held together. By pulling the upper tightly away from the edge of the sole the turn-shoe stitches are easily seen. A sharp pointed knife should be used to cut these stitches as they are revealed, one by one. The cutting of the stitches should be started at about the centre of the waist. The process is continued around the sole until the same position is reached at the opposite side of the waist. Before cutting the stitches, all the packing should be removed from the inside of the shoe. Some of this may be loose, and some may be pasted in, but it must all be taken out. Having released the stitches, the sole must be cut across at the joint. Care must be taken that the knife is held in such a way that a perfectly straight cut is obtained, instead of a slanting cut. This is necessary for the purpose of obtaining a solid grafted waist a process which has been explained as

for hand-sewn soling, but which will be further detailed in this chapter. The sole cut off, it should now be dampened, placed on a board, and gently tapped out level.

Cutting Out the Sole.—Exactitude in this matter is extremely important as the whole correct shape of the shoe depends upon this accuracy of detail. The old sole is placed upon the piece of leather from which the new sole is to be cut. This leather should be placed polished, or grain side, uppermost. The old sole should be laid upon it with the outside of the sole uppermost. The leather and old sole should now be placed upon a piece of board, and a rivet driven through the sole at the toe, one in the centre, and one at each waist corner. These rivets must penetrate the sole, the new leather, and enter the board, so as to pin the old sole and the new leather down to the board tightly. The edge of the old sole must now be gently tapped down to the new piece of leather.

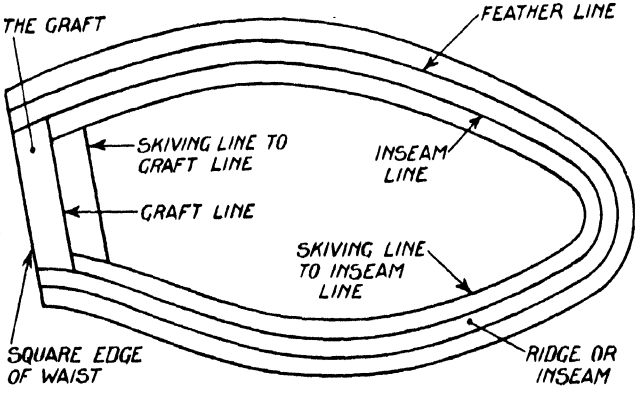
A very hard lead pencil should now be used, the point being finely sharpened. Starting at the waist corner, the pencil should be pressed tightly against the edge of the old sole, with the point resting on the new leather, and close to the bottom edge of the old sole. In this position, the new leather should be marked around the edge of the new sole with the pencil point, including the waist edge. The rivets are now withdrawn, the old sole removed, and the pattern thus marked cut carefully, and exactly, from the piece, keeping to a square edge cut.

The worker now has his new sole exactly to pattern.

The fellow shoe is then treated in the same way, and the sole cut out, as described, separately. It will not do to use one sole as a pattern for both. The next detail is the preparing of the new soles, that is, the marking for, and cutting of, the inseam to which the released upper has to be re-sewn. This inseam must be cut, as near as possible, on the new sole in the same position as it is on the old sole of the turn-shoe. An examination of the old sole will give some guide as to this, and also as to how the inseam has to be cut, and will assist in these directions.

Cutting the Inseam.—Turn the new sole flesh, or unpolished, side upwards. Mark a line across the waist, a quarter-inch from the waist edge. Next, starting at the line at the corner of the waist, make a line one-eighth of an inch from the sole edge all around the sole to the line corner at opposite waist. Then make a second line around the sole, a quarter-inch beyond the first line. Use a sharp knife, and from the first line made around the sole edge, skive to the edge of the sole to the thickness of a sixpence. The edge so made is termed the feather. Next, hold the knife upright, point resting on the second line at its commencement at the waist. Make a downward cut to half the substance of the leather all round the sole on the line. Now, mark again a third line, a quarter-inch farther inwards, all round the sole, from waist line to waist line. Starting at the waist, lay the knife nearly flat with the edge, resting on the third line, and cut at a slant towards the incised line. Do this all round the sole. A piece of free leather can now be removed. The result is a ridge on the inner sole, and this is

termed the inseam. Next, turn the attention to the waist itself. Place the point of the knife on the line made, just inside the inseam. Hold the knife upright, and make an incision along the line to half its substance of the leather. Then, mark a line a quarter-inch behind the incised line. Lay the knife nearly flat, blade edge resting on this second line. Cut at a slant towards the incised line so as to finish at the depth of the incision or cut. Remove the free leather.



Preparing sole for Turn-shoe. Turning Method.

The waist has now a semi-ridge, with the waist edge square. This is termed the graft. Attention must be given to the waist of the old sole. This must be marked, incised and skived, and the free leather removed, in exactly the same way as described for the waist of the new sole. The stitches of the upper must be cut a quarter-inch beyond the incised line. Next, examine the upper, and remove from the holes all pieces of threads, or stitches.

Grafting the Waist.—The upper is now turned inside out up to the point of the last cut stitch. At this stage, it is easy to do so as there is no sole to prevent the turning. The more difficult operation is turning the upper when the new sole is attached, and which will be explained. The waist of the old sole is now tacked down to a piece of board. The waist edge of the new sole is fitted in exact position to the edge of the waist of the old sole as closely as possible. It is very important to make sure that the outside corners of the waist of the new sole are in exact line with the waist corners of the old sole. Any deviation from this will result in a twisted shape of the forepart of the shoe. The new sole is now tacked down to the board.

To start the sewing, place the point of the sewing awl in the extreme corner of the graft to the right hand. Force the awl so that it will pierce through the cut edge of the waist at about its centre, and enter the cut edge of the old waist at the same position, and emerge on the old waist behind the graft. Place the bristle through, and draw up the thread to half its length. A stout thread should be used for this operation. Bore a second time as before, insert bristle in hole on old and new waists, and pull up the threads as tightly as possible. Proceed in this way until the extreme corner of the graft is reached, tie the threads, and cut off. Remove tacks, and take the work from the board. The shoe is now ready for the sewing in of the upper to the forepart of the new sole. It should be mentioned here that much of the success of turning a pump, or turn-shoe, depends upon the

selection of the right kind of leather. Leather as used for other classes of repairs is useless for work of this nature. The material has to be tough enough to bear the strain of the inseam being pierced and holding the stitches without breaking away when the threads are pulled up. At the same time it must be flexible and pliable, to permit easy turning, so that, in this process or detail, there shall be no risk of damage to the upper. The kind of leather to select is what is termed tanned shoulder. This should be soaked overnight, and allowed to dry off until it is quite mellow and workable. Any loose flesh on the back of the leather should also be shaved away.

Sewing the Forepart.—The operator will need to obtain a pair of wooden lasts as near the pattern of the shoe as possible. The toe of the last is placed in position with the toe of the upper. The toe of the upper is now laid over the toe of the last in such a way that the sewing hole in the upper rests on the feather of the sole. A tack is driven through the upper and the sole, at the centre of the toe. A rivet is next driven through the sole at near the centre of the toe, and into the last, it being seen that the toe of the upper is tight up to the toe of the last. A rivet is also driven through the sole, and into the last, at each joint. These rivets are to keep the last and sole in position during the sewing, and are left upstanding to be afterwards withdrawn. The upper is now pulled up at each side of the last, and a tack put through the edge of the upper at each side of the joint. These tacks, and the one at the toe, are left upstanding to be afterwards withdrawn. The actual sewing is

now commenced. The shoe is held with the toe towards the worker. The awl is placed in the upper, a stitch below the last cut stitch in the waist, and is brought out just behind the inseam in the waist of the old sole. The bristle is inserted, and the thread pulled through to half its length. The awl is next placed in the first previous sewing hole in the edge of the upper, the point of the awl pressed down on the feather of the new sole, forced through the material, and brought out just behind the inseam of the sole. The bristle on the inseam side is first placed in the hole, then the other bristle through the hole in the upper and inseam, and the thread pulled up tightly. This procedure is followed all round the sole, sewing in the holes previously made in the upper only, and emerging with the point of the awl directly behind, and at the base of, the cut inseam.

Pleating the Toe.—The sewing of the toe will require special care. If the toe is narrow, it will mean that pleating of the upper will have to be done at this point to get all the material sewn in flat without puckers. When the extreme end of the toe at the side has been reached, the upper should be pulled forward with the finger and thumb of the left hand, just before the final pull of the thread which operates on the upper side. At the same time, the thread should be finally pulled up tight. This method of pulling up the stitch separately on the upper side should be continued until the toe is sewn round. In boring also at the toe, care will need to be used to get in the necessary number of holes in the small amount of inseam available at the extreme end of the toe. The size of stitches made

will be exactly as used in the making of the shoe, as the sewing will be only in the holes made during the sewing of manufacture.

The sewing having been completed in the manner described, all tacks and rivets are withdrawn, and the last removed.

Re-turning the Upper.—The most difficult detail of all is now reached, that of re-turning the forepart of the upper to its right side out. This is easy enough at the sides, but difficult at the toe. The following procedure will assist. Place the thumbs of each hand inside the upper at the waist, and the forefingers down by the side of the outside of the waist. With the upper thus gripped, turn the wrists outwards. Follow this method until the toe is reached. Place the hand in the shoe, with the left thumb on the outside of the upper at the front edge. Place the ball of the right thumb on the extreme end of the upper of the toe. Holding the upper with the left hand, firmly press the toe inwards as far as it can be got with the thumb of the right hand, at the same time pulling the front of the upper forward with the left hand. The sides of the upper at the toe should now slip over, leaving only the very extreme end of the toe un-turned. Get a piece of stick, or an ordinary ruler, and force this tightly up to the extreme end of the toe, and it will then yield.

Shaping Up.—Immediately the shoes are turned, attention must be given to the shaping-up of the forepart. The shoes should be placed on the best fitting last, so far as the forepart is concerned, that can be selected. If the lasts are short in regard to length

they should be tightly packed at the heel. In the absence of lasts, good fitting trees will serve the purpose. The shoe bottoms should now be gently tapped down all round the edge, and the whole surface of the shoe smoothed down by means of the bottom stick, or hammer shaft if smooth, used with pressure. The shoes, with the lasts, or trees, still in them should now be placed on one side to thoroughly dry and set. Previous to inserting the lasts or trees, the packing must be re-pasted and replaced in the shoes. The next operation is a special finishing process explained in another chapter.

CHAPTER VII

Chrome Sole Soling

THE handling of chrome sole leather, such as the well-advertised Dri-ped leather, is a rather different matter to using vegetable tanned leather, or what is termed ordinary leather.

Chrome sole leathers contain grease and paraffin-wax, and it is these ingredients which provide little difficulties in working, and particularly in the finishing of the work. Chrome soles may be attached either by the hand-sewn or riveted process, and, under certain conditions, also by the adhesive process, the last being explained first.

The Adhesive Process of Attaching.—In the first place, none of the adhesives previously mentioned in this book are of use in attaching chrome soles without previous special treatment. This treatment is the de-greasing of the material. Care has to be taken, however, that the de-greasing does not extend to the whole substance of the leather. If it does, the whole purpose and aim of chroming the leather is destroyed, and ordinary vegetable leather might just as well be used. The quickest way of de-greasing the leather is by the use of a special acid which may be obtained at the chemist's. The flesh side of the sole is scraped,

and slightly roughed up with the rasp. A coat of the acid is now applied, and it is allowed to remain on the leather for a few moments. This will bring up the grease. The sole should now be wiped with a piece of rag. The leather is then gently roughed-up again, when the material is ready for being treated by the adhesive process by means of one of the various rubber adhesives previously mentioned. The idea is to remove the grease from the surface of the leather, and just below that surface. The reason for removal is a sound one, and that is that grease is absolutely fatal to the efficiency of rubber adhesives. Another way of treating the chrome sole, for the reception of the rubber adhesive, is to hold the flesh side of the leather near the fire. This will draw the grease, or fat, towards the surface. The flesh is then lightly shaved off by means of a sharp knife and the leather lightly roughed-up.

There can be obtained, however, a special leather of the chrome variety which permits easy and reliable attachment of the sole by means of a special adhesive. This leather is known as Cro-Mex, and the adhesive as Fresko.

Riveting Chrome Soles.—In attaching chrome soles by the riveted process it is best to use iron rivets. They must be of a length that will really touch the last, and allow the points to clinch. If this detail is neglected, the sole will rise during wear as the fibres are, in a way, slippery with the fat content of the leather, and in the bend of the foot, in walking, the fibres will work up by the rivet shanks.

Sewing Chrome Soles.—In making the threads for

sewing on chrome soles they should not be given so much twist as threads made for sewing ordinary leather. The action of the grease in the leather on the threads passing through is to deteriorate the value of the wax. The threads should be re-waxed at every stitch, and they will take the wax better in this way if they are loose twisted.

Channelling Chrome Soles.—The fibres of chrome sole leather are very soft below the grain. For this reason a shallow channel should always be cut in chrome sole leather. The action of pulling up the stitch will pull the thread deeper into the material below the surface of the channel. If the channel is cut too deep, the pulling up of the threads will cause the stitch to cut clean through the material at the base of the channel.

Rounding-up Chrome Soles.—On account of the softness and the flexibility of chrome-tanned sole leather, the rounding-up of the sole, previous to cutting the channel, should be done very closely, as the leather is apt to spread a little under the hammering down of the sole, and in other ways during its use. If the channel is cut near the edge, and the sole left full, it will be found, when the edge has to be finished, that the trimming of the edge will result in the knife almost reaching the stitches. That is because the edge of the sole, outside the channelling line, has yielded, or spread. The proper way is to round up very closely, and to make the channel a little farther inwards on the sole than is usual with ordinary leather. For this same reason of the tendency of chrome sole leather to spread, it is useless for the heels of shoes,

except under special conditions which cannot be applied to the soles.

Tempering Chrome Sole Leather.—The tempering of chrome sole leather cannot be accomplished by means of water in the ordinary way, simply for the reason that it is waterproof, this being one of the objects in treating the hide by the chrome sole process. Heat alone can be utilised in the matter of tempering, or making workable, chrome sole leather. The heat may be applied in either of two ways. One is to place the leather in a pail of hot water. It does not matter how hot the water is, it will not injure good chrome sole. After leaving in the hot water for ten minutes it is taken out, and immediately worked by being bent backwards and forwards between the hands. It will then be found to be quite pliable, and will mould easily to the contour of the forepart of the shoe. Another method is to hold the sole close to the fire and, when warm, to work the leather between the hands, as described. The object is to soften the wax, and the fat, in the fibres of the leather. It is not possible to work the leather without this heating method, because the state of the leather before being so treated is such that it is hard and unyielding.

Substances of Chrome Sole.—This kind of leather, by virtue of the process of tanning, is lighter in weight than ordinary leather, and the method has an effect upon the appearance of the thickness, or substance. In using chrome sole leather, a lighter substance may be used than in the case of ordinary leather, as it is generally conceded that chrome sole leather has twice

the wear-resisting properties of leather tanned by other methods.

Economy of Chrome Sole Tannage.—The economy of this type of leather is two-fold. When understood, the work of repairing is reduced in the labour of finishing the material, and the resultant wear, as stated, is at least twice that of ordinary tannages.

The method of finishing soles of this leather will be explained in another chapter.

CHAPTER VIII

Heeling

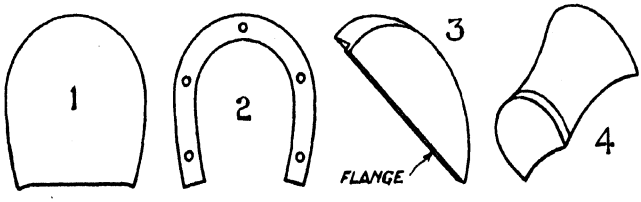
Preparing the Heels.—Heels that have been worn below the top-piece will require to be levelled, or built up, previous to attaching a new top-piece, which is really the utility part of the heel. There are two ways of doing this, one being by using skived pieces, and the other by chopping out. The old top-piece must first be removed. Next, a piece of scrap leather is selected of a size that will cover the worn part of the heel. This piece of leather must now be skived to a wedge shape. It is then placed on the worn part, the thick edge to the outside of the heel. The piece is now secured to the heel first by driving two or three iron rivets across the thin edge and into the next lift of the heel. A "lift" is the name given to the layers of leather under the top-piece. The skived piece is now pressed down tight to the top-piece. If the thickness of the piece attached makes the heel perfectly level, then a few rivets are driven around the edge of the piece, a quarter-inch inwards from the edge. If the piece falls below the rest of the heel surface, another, and smaller, piece of scrap leather must be skived to wedge shape. This must be pushed under the first piece, and the two riveted down together.

If the heel is badly worn, the building-up process is rather different. A small piece of scrap leather is first skived, and riveted at the extreme edge of the heel. This is followed by a larger piece in the same way, and so on until the heel is raised enough to be made level with the final, and largest, skived piece.

The other method of chopping out is as follows : An old knife-blade is placed across the top-lift at the least worn part of the heel. The back of the blade is then hammered, and the lift cut through. The portion is then removed. The knife-blade is then placed at the least worn part of the next lift, and the lift cut as before, and the worn piece removed. This plan is followed until the lift is reached that has not received any wear. Pieces of scrap leather, without being skived, are now fitted in to replace the pieces removed until the top lift is reached, and the whole riveted down with iron rivets of a length sufficient to reach the uncut lift underneath. This kind of heel levelling is for the ordinary type of heeling. The method is a little different for the adhesive style of heeling.

Heeling by the Adhesive Method.—Heeling by the adhesive method is confined to the attaching of top-pieces of rubber, crepe rubber, substitutes, and quarter rubber tips, except in special cases which will be explained. After the top-piece is removed, the next lift is removed also. Another lift of clean new leather is cut to shape, and attached with iron rivets placed a fair distance in from the edge. The heads of these rivets are now punched below the surface of the leather.

Attaching Crepe Rubber Heels.—The new lift of the heel is roughed-up by means of a coarse rasp. The underside of the crepe rubber heel is scoured with coarse glass-paper. One coat of Xetal Stabilised Rubber is applied to the leather heel, and one coat of Xetal Rubber Solution is applied to the scoured surface of the crepe rubber top-piece. Both these coats are allowed to become *bone dry*. This is absolutely necessary. A second coat is applied to each, and again allowed to get thoroughly dry. A third coat on each follows, and again they are allowed to get dry. The crepe rubber top-piece is then fixed in the correct position, beaten down by the palm of the hand, and then tapped down with a wooden mallet of a size that will cover the whole of the top-piece. The job is now put aside for twenty-four hours to permit certainty of setting before the finishing of the heel is proceeded with. Another method is: A thin top-piece



Heel-pieces.

(1) Ordinary top-piece. (2) Metal heel (heel-tip). (3) Quarter rubber heel tip showing flange. (4) Back view, Louis heel.

of crepe is simply riveted to the top-lift of the heel with rivets having large heads. The leather top-lift is not roughed-up in this case. A coat of one of the various rubber solutions is now given to the surface of the crepe rubber top-piece and the crepe

rubber lift. If Xetal Rubber Solution is used the coats are allowed to dry thoroughly, and the top-piece is then stuck on. If other kinds of rubber solution are used, the time of attaching is when the solution reaches the tacky stage, to judge of which, see an earlier reference. By this method, one coat of solution is all that is required.

Ordinary-shaped Rubber Heels.—These are attached in exactly the same way as given for crepe rubber to leather top-piece, using Xetal Stabilised Rubber for the leather, and Xetal Rubber Solution for the rubber heel.

Leather Substitutes.—The leather top-piece is roughed-up, and the under side of the rubber heel scoured with coarse glass-paper. A coat of ordinary rubber solution is given to each, and allowed to dry. A second coat is next applied, and also allowed to dry. A third coat follows and is allowed to reach the tacky stage, when the attaching is then done.

Rubber Quarter Tips.—Although part of the top piece is riveted, these tips are best cemented on by the adhesive system. The rubber tip is placed in position at the back of the heel, and a little to the outside tread. A mark is made on the top-piece, or top-lift, by the edge of the thin flange of the rubber tip. Just this portion of the top-lift only is roughed up. A coat of rubber solution is given to the roughed-up portion of the top-lift of the heel and the under side of the rubber tip, and the tip is attached when the solution has reached the tacky stage. The leather top-lift, untouched by the rubber, has now to be filled up to bring the surface equal to the top of the

flange of the rubber tip. A thin piece of leather is cut to shape, and fitted, being secured temporarily with two rivets only. A pattern is now cut for the leather top-piece, allowing for the space taken by the thick part of the rubber tip. The cut edge of the top-piece, which has to be fitted close to the inner edge of the rubber tip, should be cut slanting a shade towards the flesh side of the leather. This will enable the top-piece to bind tightly to the rubber tip. Four rivets are driven across the edge of the top-piece at this point, and a row close to the edge of the outside tread. Four rivets are then placed on the inside tread of the heel, at equal distances. The top-piece is now tapped down level with the hammer. As the rubber tip within the flange is of a deeper substance than the usual substance of leather, a thick top-piece will have to be specially selected. The alternative is to put on a thin lift first, of the pattern of the top-piece, and this will bring the top piece up level with the surface of the rubber tip.

Louis Heels.—Usually this type of heel is of wood covered with thin leather, or other material. As the heels are high, and very narrow, care has to be taken in driving in rivets or the wood heel will split. The best way to treat this class of heel is as follows : The old top-piece is removed, and a thin top-piece attached with short rivets with large heads. A final top-piece can then be safely attached either of rubber by the adhesive process, or of leather. Another method is simply to remove the old top-piece and attach a thick leather top-piece, by placing one rivet at each corner, one at each side, and one at the back. The top-piece

should be tapped down very gently, and whilst the tapping is being done the risk of splitting the heel will be lessened if it is gripped around the narrowest part tightly by the left hand. The top-piece for this kind of heel should always be cut full in size, to allow it to be trimmed down in the finishing at a slant in such a way that the top-piece meets the wood heel edge flush, but slants out to give extra surface on the top of the heel.

The Blinded Heel.—In the case of ward shoes, or the like, it is usual to adopt what is termed the blinder system of attaching the top-piece. Two long rivets are driven across the front edge of the heel. A row is driven around the heel, half an inch apart. These rivets are left well upstanding. Sharp cutters are then used to cut off the heads of the rivets. This leaves the tops of the rivets somewhat sharp, and pointed. The top-piece is cut out in exact shape, and placed on the top of the rivets in correct position for fitting the heel. A wooden mallet is now used, this being of a size that will cover the whole of the top-piece. A smart blow is given to the top-piece with the mallet, and this drives the leather down on the upstanding rivets. The levelling down is now completed by using the ordinary hammer around the edge of the top-piece, and across the edge of the front. The result is a heel the surface of which is free from nails or rivets.

Leather Top-pieces.—The attaching of these is simply explained. The top-piece must be tempered so that it will bed down to the lift. In attaching, a rivet is driven at the centre of the edge across the front of the top-piece and one near the back of the

heel. This holds the top-piece in position whilst it is being rounded, or trimmed, up close to the level of the top-lift. A rivet is next driven at the corner of the inside tread, another half an inch farther along, a third again half an inch beyond this, and from then onwards a row of rivets is driven, close together, until the opposite corner of the top-piece is reached. The top-piece should be marked around for the rivets one-eighth of an inch from the edge. The levelling down of the top-piece is done by first hammering along the riveting line, and then the surface of the top-piece within the rivets.

Metal Heels.—By this is meant heels which are fitted with an iron rim the shape of the heel, and termed a heel-tip. The tip should be selected a shade smaller than the top lift. It should first be placed in the hollow of the bottom of the last or iron foot (the instep), under side of the tip being uppermost. The metal should then be gently tapped with the hammer between the nail holes. This will make the tip slightly concave-convex, and will assist in making the tip fit closely to the surface of the top-lift. The tip is now fixed carefully in position on the heel, and a tip nail driven partly down at one of the front corner holes. A nail is then driven partly down at the opposite corner hole. Then, a nail is driven fully down at the extreme back of the tip, and then the two forward corner nails driven fully home. The rest of the nails are now driven in, and the tip hammered down. There is, of course, a cavity, or space, on the top-lift within the rim of the tip, and this will now have to be filled in.

Fitting the Tip Filler.—The empty space is filled with leather, and this is termed a tip filler. The correct pattern is easily obtained in the following manner. A piece of scrap leather is selected of a thickness equal to that of the rim of the iron tip. This is placed on the top of the tip and struck smartly with the mallet, the leather being placed flesh side downwards on the tip. This action will give on the flesh side of the leather an impression of the inner edge of the rim of the tip. The pattern so marked is now cut out. After cutting out, the edge should be slightly bevelled towards the flesh side. The filler is now placed in position within the tip, and hammered down. The bevelled edge of the leather will enable the filler to fit closely to the inner rim of the tip. A few rivets are now driven around the edge of the filler, and the job is completed.

Revolving Rubber Heels.—These, though apparently simple to fix by means of the centre screw, require some care if a proper fit is to be made. First, the top-piece should be hammered down in the centre to make it a little hollow. Next, if the revolving heel is fitted with an iron cross plate, this plate should be placed on the hollow part of the surface of the last, or iron foot, as is done with the iron heel tip, under side upwards. Each portion of the cross should be tapped with the hammer to bend the other side outwards a little. The heel is now screwed on, and the under surface of the rim of the rubber should fit closely to the surface of the top-piece, yet allow the heel to revolve freely, which is the proper fitting of a revolving rubber heel.

Should the fitting be still imperfect, however, the screw should be withdrawn, when it will be found that the surface of the top-piece, or lift, has risen around the screw hole. This raised leather should be cut away, and the lift tapped down around the screw hole, and the heel again screwed on. This will result in a perfect fit. If these directions are not carried out there will be an open space between the rim of the rubber and the lift, or top-piece, under which dirt will gather and prevent the proper revolving of the heel in wear. Should the screw be tightened to alter this, the heel will not revolve at all. The idea of the revolving heel is that it shall turn during wear, and wear down evenly all the way round its edge. This can only be provided for by the method given.

Metal Quarter Tips.—These are affixed in the same way as described for rubber quarter tips, except that the tip is attached first by means of a "plug" nail driven through the rim. Instead of a plug nail, some tips are provided with three holes, leather plugged, in the rim, as in the well-known "Snow's" quarter iron tips.

CHAPTER IX

Selecting Sole Leather

HAVING dealt with the principal items of the actual use of sole leather, it might be well, at this stage, to give some details as to the selection of sole leather, in so far as its suitability for the various classes of work is concerned, and as to its qualities. The finished product is turned out from the tanneries in what are termed butts and bends. A butt is the whole hide, tanned in one piece. Sometimes the hide is cut down the middle from the tail, along the backbone to the neck, or shoulder. The two pieces resulting are termed bends. Sole leather is made from English hides and from imported hides, and it is tanned either by the mineral process, making chrome sole leather, or by means of tanning extracts, vegetable leather, or by the old-fashioned method of the use of oak bark, the latter making the best quality of sole leather. There are certain characteristics looked for in selecting a bend, or butt, information as to which will be useful to the student of this book even if his purchases should be of small pieces, or cut soles.

There are two direct outstanding qualities of leather, the pure and unadulterated, and the adulterated

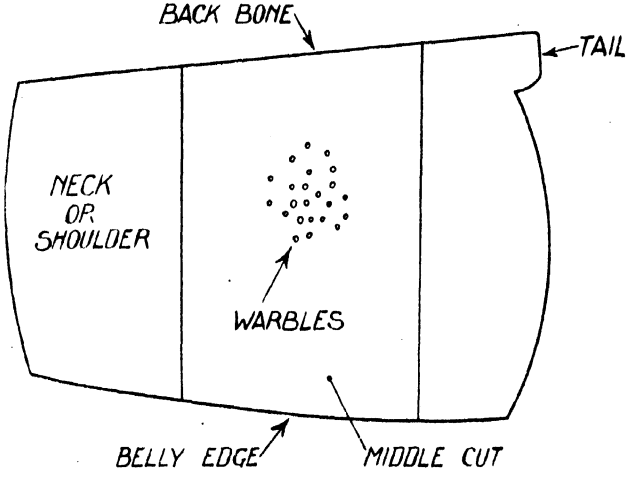
leather, which is termed loaded leather. The latter is obtained by introducing weighting ingredients into the pores of the hide when these have been opened during the tanning process, hence the term " loaded " leather. This leather is cheaper than the unadulterated leather, but it weighs very much heavier. As leather for soles is sold by weight, the reason for loading, and weighting, the hide will be obvious. It is here that a little illustration may be given to show the care necessary in buying. The loaded bend may be, say, three shillings per pound, and the unloaded bend four shillings. Apparently, the loaded bend is the cheaper. If a pair of soles are cut from each, of exact thickness or substance, and placed in the scales, the soles cut from the loaded bend may weigh eight ounces. Those cut from the unadulterated bend will, in comparison, probably weigh six ounces. The soles from the loaded bend will thus cost one shilling and sixpence. Those cut from the pure bend will work out at exactly the same cost. The illustration does not, however, end at this, for the loaded bend is really the dearer leather ; for this reason. It is only the hides of the commoner quality that are treated to the loading, or weighting, process, and the best selected hides form the product of the unadulterated leather. Consequently, better leather is obtained at the same price as cheap and adulterated leather. It will be apparent then, that the purchaser should ignore the initial price per pound, and purchase what seems the dearer product, the pure and unadulterated leather.

Flaying Damage.—One of the first things to examine is the back of the leather, the unpolished side. Some-

times it will be noticed that there are scars, long lines, on the back. These are cuts made by the knife when the hide is being stripped from the carcase, and are called flaying cuts. Sometimes these cuts are only superficial, but, again, they are sometimes deep, and this fact is hidden by the materials used in finishing the back of the leather. To discover if these marks are deep cuts, turn the leather over on to the grain, or polished, side, and examine the colour carefully. If streaks are seen of just a shade darker colour than the rest of the surface of the bend, then turn the leather over to the flesh side, and note if there is a flaying mark at a corresponding position. If there is, then the cut has penetrated the hide. If a pair of soles are cut out, bearing a part of such a flaying mark, it means that there would be rapid wear of the soles at that point. Such leather would be discarded by the discriminating buyer either in the bend, piece, or cut soles.

Warble Damage.—This is another common, but serious, fault which must be looked out for by the buyer of leather. The damage is caused by an insect known as the warble-fly. The eggs of this insect are taken into the inside of the animal, are then hatched, and at a certain stage the insect emerges through the hide of the animal. That is one theory. Whether the theory is correct or not, the fact remains that holes are punctured clean through the hide, and the largest circumference of the punctured hole is always on the flesh side of the leather, and terminates in a pin prick on the grain side. The holes on the flesh side are often as large as a pea. These holes are nearly

always to be found in the best part of the hide, and will be seen in the centre of a bend of leather. Usually, also, the warble-fly only attacks the healthy animal, and, therefore, the kind of leather likely to bear warble damage is the best leather, and at its best portion. As stated, the signs of warble damage can scarcely be seen on the finished side of the leather,



Bend of sole leather, showing how warble-fly damages the best part of the leather—the middle or prime cut.

that is, the grain side, owing to the finish and the small pin point damage. On the back side of the leather, the larger warble hole is filled up and smoothed over, so there is practically no indication of the damage. The extent of this damage can be easily ascertained in the following way. Examine the grain side carefully for the pin prick sign. When these are noted, turn the leather over, and closely

examine the corresponding position on the flesh side. Close examination will show that, though the holes are filled, there is a very slight depression where each hole is located. Next, with a fine blade of a small pocket knife, or something similar, probe the holes, and the filling will be released. If it is cleaned right out, a pin can be easily pressed through to the grain side. The effect of using a pair of soles containing warble damage is this. Though there is no immediate faulty wear, as soon as the sole does begin to wear down in substance the holes in the sole increase in size as the wear is continued. After the grain surface is worn away, rapid deterioration sets in around the warble holes. Such leather should not, therefore, be purchased for soles. As stated, however, it is usually the best part of a good hide that is so damaged, and therefore good leather in itself. It can be bought and used for heels with safety, provided that the heels are cut from such leather so that the warble holes do not work out at the edge of the top-piece.

Forced Tannage.—The best leather is air dried, by a slow process, during the tanning. Cheap leather is forced in the drying process, with the result that it has a burnt effect. Forced dried leather may be recognised in the following way. If the bend is examined, one edge of its whole length will be seen to have a square, or cut, appearance. This is termed the backbone edge, and is where the hide is cut down the middle to form two bends. The opposite edge of the bend will appear a little rounded. This is termed the belly edge, and is exactly what the term indicates. For several inches inwards, this edge is much softer

than the backbone edge, and would, naturally, be more sensitive to treatment of any kind. If the polished side of the leather is examined, and the belly edge for a few inches inwards shows a darker shade than the rest of the surface, and is not so bright, then it is almost certain that the bend has been forced in the drying, and is burnt. If it has been badly forced, and the edge of the bend so discoloured is doubled, it will be seen that the face of the grain has cracked, and it may be even possible to break or snap off a portion of the belly edge. Such leather should, in all circumstances, be rejected.

Faulty Rounding.—Good quality leather is always well rounded, and common leather is usually badly rounded. Rounded, in connection with a bend of leather, means this. All the soft parts, and extra thin parts, of the belly edge, neck and the shoulder should be cut off the hide, and they are tanned for other purposes into leather that fetches a much lesser price than bend leather. If this material is left on, it is thus sold at a higher price than it is worth. Such leather is of no use for soles. If it is left on the bend, it is termed a badly rounded bend. If taken off the hide, as it should be, it is termed a well-rounded bend. To discover if a bend is badly rounded, the following is the procedure. Place the fingers under the flesh side of the belly edge, and the thumbs tightly down on the grain side of the leather. Start at the shoulder end of the bend, which is the square cut end. Turn the belly edge back, grain to grain. The margin which is so soft as to be easily bent should have been rounded off. The real fit leather for soles commences when

the bending of the material is met with some resistance. Test the bend in the same way across the bottom edge of the shoulder. If the bend is well rounded, only an inch or so in depth can be bent back without resistance. The loose stuff thus found has to be cut off the bend by the purchaser, and is only fit for building up worn heels. The actual cost of the usable leather is thus increased by the amount of inferior material rounded off.

Testing the Grain or Fibre.—Another important point is the quality or condition of the grain, or fibre, of the leather. If it is of, what is termed, close grain, then the wearing qualities are likely to be good. If it is of open, or coarse, grain then the wear will be indifferent. The test can be made either with a whole bend, or a small cutting, by the following method. Cut a piece of the leather so as to get at the meat proper. Drop a little water on the edge. If the water enters the grain quickly, that is, if it is quickly absorbed into the leather, the material is of open grain. If it remains on the edge, and takes a long time to be absorbed, then it is of close grain. Sometimes, however, the water will remain on the edge even if the leather is of open grain. This is when the leather is highly loaded. The pores are filled with lime, sand, chalk, or other ingredients which counteract the immediate effects of the water. If doubt is felt as to whether the leather is of close grain, or merely loaded open grain, it should be soaked in water for a time. Then it is taken out of the water, and allowed to drain off for about a quarter of an hour. It is then placed on the last, or iron foot, and hammered lightly. If it

is of open grain the substance will then be very much reduced, and the surface will spread a little. Leather of open grain should be rejected, but it is suitable for heavy nailed work if bought at a cheap price.

Colour of Leather.—Often the buyer will judge the quality of leather by the colour of the grain, and its polish. If it is of a nice attractive colour, even in the shade, and highly polished, it is generally accepted as being good leather, and if the grain is of poor colour, uneven in its shade, and dull, it is considered of poor quality. This is an unreliable guide. The commonest leather can be highly finished, and polished, and extra good quality leather may be, and often is, quite indifferent in colour, and polish. The only result of colour, and polish, is for the leather to cost more. If a good-class leather is only roughly coloured, and polished, it can be sold at pence per pound less than if time, and materials, were spent in giving the surface a highly polished, and finished, appearance. The best value, therefore, is in the unpolished leather, providing it is a quality bend.

Chrome Sole Leather.—Many buyers go astray in the selection of this material, owing to a mistaken idea as to the real effects of the chrome sole process. The popular imagination in the trade was that if a poor hide was tanned by the chrome process it became good leather. This is an entirely mistaken idea. No chrome process can make a poor hide into a good one. On the other hand, if the hide is of poor quality, and open grain, the chrome process will destroy the fibres, and reduce the wearing qualities of the leather. But, the action of the chrome process on a good hide

of close solid grain, is to double its wearing qualities. Only chrome sole leather of the best makes should, therefore, be purchased, such as Dri-ped, Western Star and other well-advertised tannages. Not only is the matter of the wear in question, but the cheaper chromes are most difficult to work on.

Belting Leather.—Disused, or scrap, belting leather is a good investment for rough boot repairs. Its one drawback is that, owing to the grease in the fibres, it cannot be made to finish up so well as the usual shoe sole leather, but it has excellent wearing qualities. This is due to the fact that all strain has been taken from the leather in its use as belting, and all belting leathers, owing to the strain in wear to which they have to be subjected, must be made from hides of the highest quality. New cuttings, that is, short end pieces that are made in getting out belt lengths, can be purchased much cheaper than can good sole leather, and used belting may be obtained still cheaper. It is satisfactory for all but adhesive work, and is easy to use.

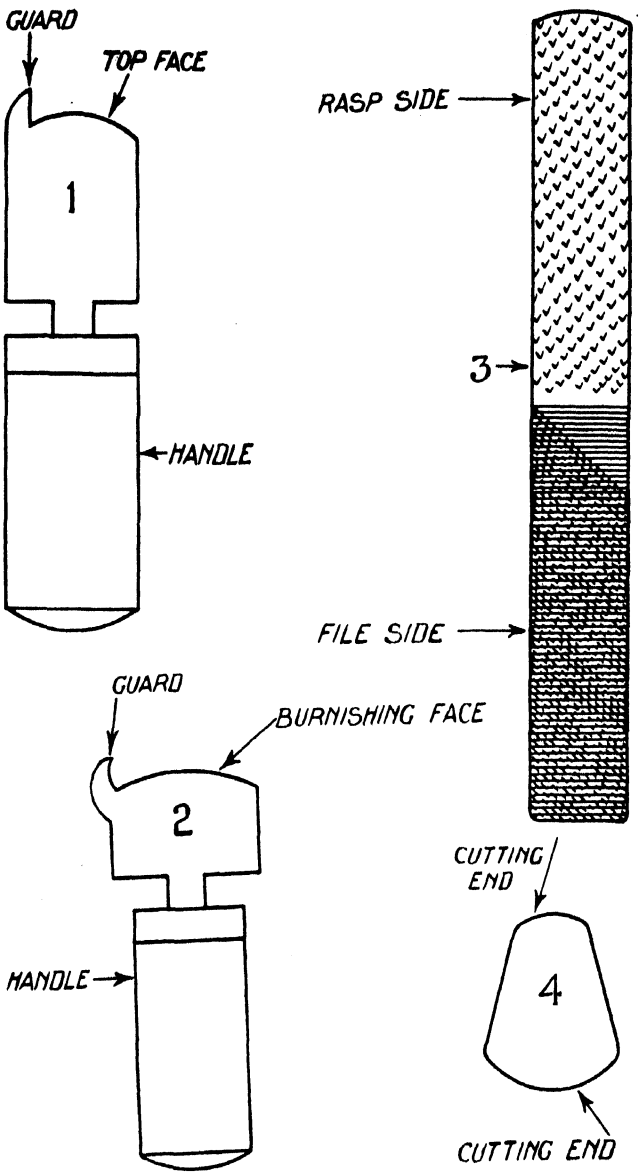
Suitable Types of Leather.—The following are the most suitable types of leather for the classes of work indicated. For hand-sewn work: mellow, light weighing leather, preference being given to oak bark tanned. For riveted work: firm, close-grained leather, vegetable tanned. For turn-shoes: tanned shoulders. For waterproof repairs, either sewn or riveted: best quality chrome-tanned leather.

CHAPTER X

Hand-finishing.

The Tools.—For ordinary methods of hand-finishing, the following tools will be required : A sharp paring knife of small pattern, a rasp three-quarter flat and one-quarter round, a scraper, a heel dummy burnishing iron, a sole setting iron, and a fudge wheel. All of these tools may be easily obtained from the usual leather and grindery shops. The dummy burnishing iron is an oblong piece of steel, slightly rounded, set into a wooden handle. The sole setting iron is of similar pattern, but much smaller, one side having a flange which is termed a guard. The scraper is a piece of flat steel, oval shape, or oblong, with half rounded ends. The fudge wheel is a small revolving wheel with teeth, or grooves, set in a wooden handle. The knife is used for trimming away rough, or surplus, leather from sole and heel, the rasp is for rasping the trimmed edges closely, and the scraper for taking away the marks made by the rasp. The fudge wheel is for making lines, or impressions, on the welt to give the welt a finish.

Trimming Up.—The surplus lifting on the heel, and overhanging top-piece and sole, are first trimmed as closely as is possible by means of the paring knife,



Repairing Tools. 1. Forepart Iron. 2. Burnishing Iron. 3. Rasp. 4. Scraper

care being taken that the trimming is kept square. If, on trimming the sole edge, the knife is held at a wrong angle, the sole may be trimmed inwards towards its centre. If this happens the sole edge will grind away quickly in wear. It must also be seen that, in sewn work, the trimming is not done too close to the channel or the rasping will reach up to, and expose, the stitches. In paring the heel, it must not be done too close to the rivets, or the rivet shanks will be reached by the rasping process. It is better to trim up so that edges may be finished at a shade of an outside slant.

Rasping Up.—The flat side of the rasp is used for the sole edge, and the rounded side for the heel. The motion of the rasp is to rub forward, one way only, not backwards and forwards. In rasping the sole edge, the new sole must be rasped until it is quite level with the welt edge, and all uneven places made perfectly level. In rasping the toe, the rasp should be used with one sweep round from the side of the toe to the opposite side. If the operation is not done in one movement, there will be ridges at the extreme toe-end. The top-piece and lifting, used on the heel, must be rasped until perfectly level with the lifts, and conforming to their shape.

Scraping or Buffing.—This follows the rasping, and the first detail to be seen to is that the scraper is in condition and quite sharp for the purpose. The scraper is put in order in the following way. It is laid on a piece of board, placed on the knee, the end of the scraper overhanging the edge of the board. It is held firmly in this position by pressure of the

left thumb. In the right hand is held a sewing awl. This is placed with the shank flat on the overhanging edge of the scraper. The edge of the scraper, on the flat, is now rubbed backwards and forwards with the shank of the awl with as much pressure as possible. The scraper is now turned over, and the other side treated in the same way. Then, both sides of the other end are also treated in the same manner. The scraper is next wrapped around with a piece of rag by which to hold it tightly, the edge of one end being left exposed. The awl is now rubbed vigorously along the square edge of the scraper, and the same treatment given to the other end. If the scraper is now tried on a piece of leather it should scrape perfectly. The idea, in the sharpening of the scraper, is to turn the edge over at each side to form a raw outstanding edge. The scraper thus sharpened has four cutting edges, or sides. The narrow end is intended for the sole edge, and the wide end for the heel. The shoe should be held between the knees with the sole bottom to the right hand. Start should be made at the joint, or waist, and as long a scrape made as possible before removing the scraper from the edge for the next movement. In replacing the scraper on the edge, it should be placed at a point a little farther back than where it was taken off. This is to prevent ridges in the edge. The toe should be gone around at one movement, without taking the scraper away from the edge. The shoe is now turned over to allow scraping along the other side of the edge to the joint or waist. To scrape the heel, place the forepart of the shoe between the knees, the heel projecting above, and

grip the shoe tightly with the knees. This will leave both hands free to get more pressure in the scraping, and longer strokes. The top-piece of the heel should be to the right hand. Start scraping at the heel corner, covering as much as possible of the lifting, and top-piece edge, with the scraper. Take the scraper as near to the back of the heel, at the one stroke, as can be done. Scrape round the back of the heel at one stroke, and continue along the other side of the heel till the corner is reached. The edge, and heel, should now be examined for any ridges, or unscraped spots, and these put right. It will now be seen that the rasping and scraping have caused a raw edge, upstanding on the extreme edge of the sole and top-piece. This is termed the knap. This must be taken off, either by means of the point of the trimming knife, or by the use of the smooth, flat side of the rasp. The heel, and edges, should now be well scoured, first with coarse glass-paper, and finally with fine glass-paper. The edge of the welt is now rubbed round with the flat smooth side of the rasp. It might be mentioned here that the process of trimming, rasping, and scraping will be aided by the use of the water brush. A small brush is dipped in water, and brushed around the edge of sole, and heel. Trimming will then be easier, and cleaner. The edge, and heel, are again water brushed, and this will help the rasp to close up the edges. Water brushed again, a cleaner scrape will be obtained to follow the rasping. The shoe is now ready for being given a coat of ink to the treated edges.

Inking the Edges.—Shoemaker's ink can be obtained

for this purpose from any leather and grindery shop. To start the inking, hold the shoe by the instep in the left hand, bottom upwards, toe to the right. Start with the brush at the waist edge, and ink along to the toe. Twist the wrist, and bring the toe forward. Ink the toe, then twist the shoe farther round, proceed along the edge, and ink the side of the heel. Another twist, and the back of the heel, and farther side, can be completed. By this method, the shoe does not leave the hand, and its position prevents the ink from running on to the bottom of the shoe. The shoe is now allowed to remain on one side until the ink is nearly, but not quite, dry.

Setting the Edge.—This is the next operation, along with burnishing the heel. Place the boot edge-way up across the knees, the upper being next to the body, and the toe to the left. Grip the boot at the toe with the left hand. The sole iron must be only just warm to set the edge whilst the ink is still damp. Place the guard of the iron in the welt, and the flat surface of the iron square on the edge of the sole. Start at the waist and rub along the edge as far as possible without removing the iron. Having reached the side of the toe, hold the boot between the knees with the toe upward. Iron around the toe at one stroke. Place the boot across the knees again, this time with the toe to the right, and proceed as before with the ironing to the waist corner. Reverse the position of the boot, and repeat the operation, this time with the guard resting on the sole edge. It must be understood that heavy pressure is needed in this ironing operation. The edge is now set, and is ready for burnishing.

Warm the heelball, and smear a little around the sole edge. Warm the iron so that it can just be borne to the touch of the finger. If the iron is more hot than this it will burn the edge. If not hot enough, it will not melt, or distribute, the heelball. Repeat the ironing operation as before.

Burnishing the Heel.—Slightly warm the burnishing iron. Hold the boot across the knees, toe to the right hand. Lay the iron on the heel lengthways. Rub up and down from the edge of the top-piece to the bottom or seat of the heel. Repeat this all round the heel till its surface has been covered. Smear a little heelball on the heel, particularly between the edges of the lifts. Re-heat the iron. Place the iron on the heel the opposite way about for this re-ironing. Rub round the heel the same way as the joints, between the lifts and not across them as before. Heel, and sole edge, are now ready for rubbing off. This is done by wrapping a piece of cloth tightly around the right thumb. Rest the fingers against the bottom of the sole, and thumb pressed tightly on the sole edge. Rub briskly around until all trace of heelball is removed. Treat the heel in the same way. The forepart is now ready for fudge-wheeling.

Using the Fudge Wheel.—Heat the wheel so that it can be touched with the finger without discomfort. Hold the boot in the left hand, bottom of sole downwards, toe to the left. Place the wheel square on the welt. Wheel as far as possible along the welt till toe is reached. Turn the boot at the toe whilst still wheeling, and wheel around the toe, and along the welt till the waist is reached. This must be done without

removing the wheel from the welt during the operation if the welt is of any width, as removing the wheel, and replacing it, will result in cross impressions. Finally, rub the shoe over lightly with a soft cloth to get the finished gloss.

Finishing the Turn-shoe.—This requires rather different treatment as the turn-shoe sole is of exact measure, and will not permit rasping. There must also be no space between the edge of the sole and the upper, as a welt. The edge is finished right close up to the upper in turned work. Scour the edge with fine glass-paper carefully. Then ink, and allow to dry. Wrap cloth tightly around the thumb, and rub round the sole edge briskly. Smear a little heelball around the edge. Warm the cloth, and rub briskly again around the edge of the sole. Finish with a rub with a soft cloth.

Louis Heels.—As these are only top-piece heels, the edge of the top-piece is carefully rasped, scraped, and scoured so that the covered heel is not touched. The ironing is done with the sole edge iron, the guard resting on the top-piece during the ironing.

Finishing Crepe Soles.—Very little finishing is needed, beyond the trimming up, for crepe rubber soles. Use a very sharp knife, and dip the blade constantly in water during the cutting. Trim as closely as possible, and finish with brisk scouring with coarse glass-paper, rubbing one way only, around the edge. If the extreme edge of the surface of the sole still appears raw, trim off carefully with a sharp pair of scissors. No further attention is necessary, as crepe soles are usually left in their natural colour.

Leather Substitutes.—Most of these, such as Itshide and Uskhide, can be treated with the rasp and scraper in the same way as leather, but it is better not to use the warm iron in finishing the edge. Let the ink get nearly dry, set the edge with the cold iron, and leave till the edge is quite dry. Afterwards, finish with cloth and heelball, as described for turn-shoe edge.

Bottom Making.—The operator may desire to finish the bottoms of the soles. There are three usual varieties, the brown, black, and white.

Making Brown Bottoms.—The surface of the sole is well scraped, and then scoured, first with coarse glass-paper, and then with fine. The bottom is now rubbed over from waist to toe briskly with a round stick of boxwood. A mixture is now made of half a pint of milk to which an eggcupful of ammonia has been added. This is well shaken, and a coat applied to the sole by means of a piece of clean, white flannel. The sole is now stroked briskly with the palm of the hand until it is nearly dry. The boxwood stick is now rubbed with pressure over the sole, using long strokes from waist to toe, when the bottom will, with this friction, burnish up to a glossy brown.

The Black Bottom.—Instead of the ammonia mixture, a coat of shoemaker's ink is applied. When nearly dry, the warm burnishing iron is rubbed over the sole until an even and glossy polish is obtained. This is followed by a brisk rubbing with the cloth, frequently warmed during the process.

White Bottoms.—These are prepared as for black or brown, and they are then given a coat of what is termed bottom wash. This is made in the following

way. From the leather and grindery shop obtain two white bottom-balls, and one pink. Crush these up into powder, and place in a pint bottle. Add a small packet of Epsom salts. Fill up the bottle with hot water. Allow to stand overnight. Before using, shake up the contents well. Apply a coat of this to the shoe bottom, using a piece of clean flannel. Place on one side to dry, and when dry it should be a white bottom of porcelain appearance. No other treatment is necessary.

CHAPTER XI

Patching by Adhesives.

THE progress made by the trade chemists in respect to various adhesives, for the use of the shoe trade, has increased the adhesive method of attaching material to shoe uppers, and the method of using is, therefore, given in this chapter.

Matching.—The most important detail in successful patching by the adhesive process, termed invisible patching, is in the correct matching of the parts to be united. The popular upper leathers are black box calf, black glace kid, tan willow calf, and tan glace kid. The various qualities, or grades, of these present different surface appearances. A loose box, or willow, calf will have a coarse, wavy surface, whilst the skin of a close grain will have a smooth surface. The same remark applies to black and tan glace kid. It will be obvious, therefore, that if a patch of loose, or coarse-grained, box calf is placed on an upper of smooth-grained box calf, no matter what pains are taken in the attaching of the patch, it will be conspicuous. Therefore, in selecting a piece of material with which to patch a shoe upper, the very first consideration is the matching of the grain, or surface, appearance. When we come to colours, the same

principle applies. The colour, and shade, of the material selected for the patching of the upper must match that of the upper itself, or invisible patching cannot possibly result.

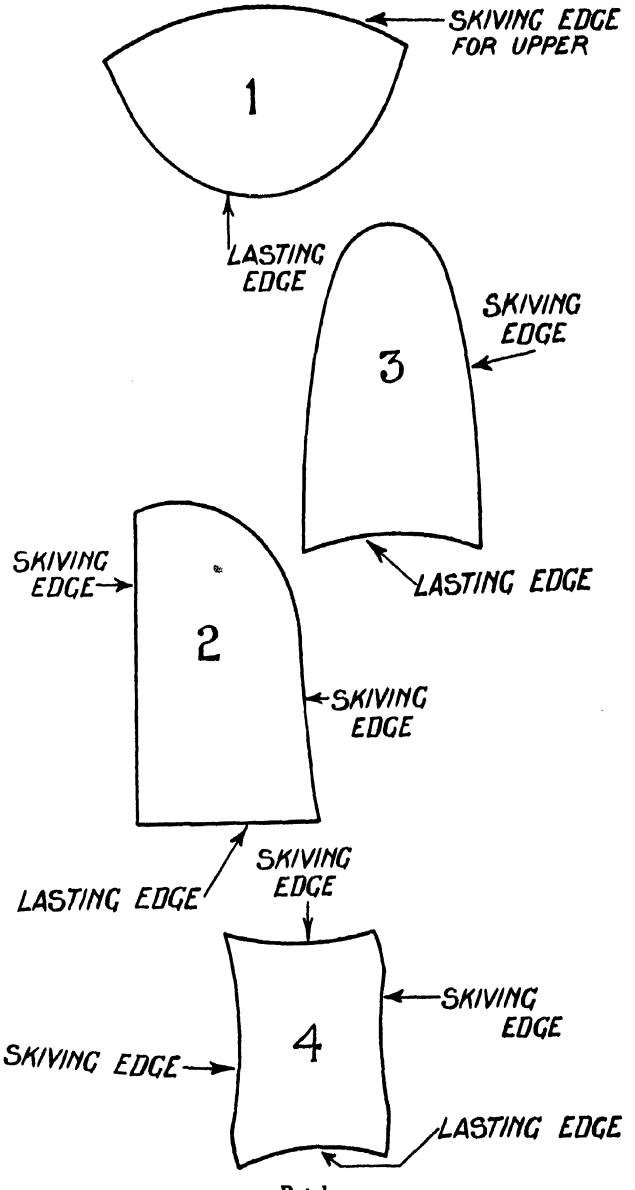
Preparing the Patch.—The patch should be cut of a size that will well cover the broken part of the upper, say, allowing a quarter-inch extra measurement around the edges of the break on the upper. If the patch is required in a position well up on the upper, and not close down to the edge of the sole, the following will be the procedure. When the patch is cut out it is laid on a board, or, better still, on a piece of glass, and the knife placed on the edge, about one-eighth of an inch inwards, on the under side of the material. A slanting cut is made, so that the extreme edge shall be thinned down to the substance of tissue paper. The rest of the surface of the patch is scoured with coarse glass-paper.

Preparing the Upper.—The patch is now placed in correct position on the upper. A sharp pointed knife is used for the marking of the part of the upper to be treated. The point of the knife is placed close by the edge of the patch, and drawn around the patch, making a slight incision. If the upper is of glace kid, the surface so marked off can be lifted, and peeled off. If the upper is of box calf or willow calf, the face of the leather cannot be so lifted, but must be gently, and lightly, skived with a sharp knife within the marking.

Attaching the Patch.—A coat of good rubber solution is next applied to the prepared part of the upper, and to the patch. In applying the coat of solution to the

patch, it should be seen that the extreme edge is well covered. Xetal Stabilised Rubber is the best adhesive for this class of work, as, having to be allowed to get thoroughly dry, the patch and shoe can be handled without risk of touching the wet adhesive, as in other makes of rubber solutions. When the coats of Xetal are quite dry, a second coat should be given to the shoe upper and the patch, and again allowed to get bone dry. The patch is then placed in position, and pressed to the upper at the centre of the patch. It is then smoothed with the fingers towards the edges. The shoe should next be slipped on to a wooden last, and gently tapped down, most particular care being taken to tap down the edge of the patch. The burnishing iron should now be slightly warmed, and the patch ironed over. Next, a little heelball should be applied to the joint at the edge of the patch, and the warm iron applied to the edge over the heelball. A piece of cloth should now be rubbed briskly around the edge of the patch, finishing with a final light rubbing. If a wooden last is not available, a good fitting boot tree will serve the purpose for this operation.

Sewn-down Patches.—In the case of toe-caps, or side breaks on the upper close to the edge of the sole, the patch will have to be cut of a size that will allow for the edge nearest to the sole of the boot to be sewn down to the sole, or put underneath the sole, as the shoe will permit. The edge of the patch to be so treated will not, therefore, have to be skived, or thinned down, but left at its full substance. If the patch is to be sewn down, the following will be the process, after the patch has been attached to the



Patches.

(1) Toe-cap. (2) Patch for vamp close to toe-cap. (3) Patch for break low down to welt. (4) Patch to top of golosh on vamp.

upper itself. The edge of the patch is forced into the welt, using the blade of a screwdriver, or a piece of wood cut to a wedge shape. A waxed thread is then used, the sewing being started a quarter-inch beyond the edge of the patch laid in the welt. The sewing awl is pierced through the patch edge and the welt, and emerges on the edge of the sole. The last stitch is placed a quarter-inch beyond the edge of the patch. The edge of the patch is now trimmed off level with the edge of the welt, and the welt edge finished up by scouring, inking, and setting with the forepart of the setting iron.

Sewn-down Toe-cap.—The pattern of the toe-cap is cut to fit up to the first line of stitching of the cap, thus leaving the old punch holes, or pattern, of the cap border to serve. By the edge of this first line of stitching on the cap, the surface of the leather is given a slight incision with the point of a sharp knife. If the cap is of glace kid, the whole face of the cap may now be peeled off. If the upper is of box calf, the whole surface of the cap within the marking will have to be lightly skived. The cap and new toe-cap are now given two coats of Xetal Stabilised Rubber, as previously explained, and allowed to dry. The boot is now held on the knees with the toe forward. The extreme corners of the toe-cap are taken between the fingers and thumb of each hand, and the cap placed in position first at the centre. The corners of the cap are now pulled down tightly, and the sides attached. This takes the stretch out of the toe-cap. The shoe is now placed on a last, or boot tree, and tapped down. The edge of the cap is forced in the

welt in the following way, to enable the pleats to be taken out. The left hand corner of the cap is pulled down tightly, and forced in the welt with the blade of a screwdriver, or wedge-shaped stick. Half an inch of the cap forward is next pulled tightly down, and again that portion is forced into the welt. This method is continued until the opposite cap corner is reached. The shoe is now placed on the knees, heel forward, sole bottom to the left hand. Sewing is started a quarter-inch beyond the cap corner, and continued around the cap to a quarter-inch beyond the other cap corner. If a pleat arises during the sewing, the cap should be pulled down tightly just before putting in the stitch. The awl is pierced through the edge of the cap laid in the welt, through the welt, and emerging on the edge of the surface of the sole. The surplus leather around the edge of the cap is next trimmed up level with the welt edge, and the sole edge tapped down over the stitches. The warm iron is now run over the joint of the cap and upper, and the welt edge scoured, inked, and set up with the forepart iron.

Lasting-in a Patch.—Lasting-in is done in place of sewing down the patch when the shoes are also to be re-soled. If the shoes are of the single-soled variety, the edge of the patch is simply pulled over on to the edge of the upper on the inner sole, and fastened down with tingles of seven-sixteenths of an inch in length. If the shoe has a middle sole, it should be lifted by means of the screwdriver just enough to allow the edge of the patch to be forced under between the middle sole and the inner sole, and the middle sole, at that

loosened point, is then fastened down with half-inch tingles, penetrating the middle sole and the edge of the patch.

Lasting-in a Toe-cap.—If the shoe is not single soled, the middle sole must be lifted, and turned back to just beyond the extent of the cap. It is then doubled over, and secured in this position with a rivet, left upstanding to be withdrawn afterwards. The cap is now pulled up with pincers at the centre of the toe, the edge laid on the inner sole, and a tingle driven flush. Each corner of the cap is then treated in the same way, and the real lasting-in commences. The cap is pulled up by the side of the left hand corner, and given a twist in the pulling to bring the pleat away from the front of the cap and on to the inner sole edge. A tingle is then driven just beyond the pleat. The cap is again pulled up just beyond the tingle, treated as before, and another tingle driven in just beyond the pleat. This method is carried out till the whole of the cap is lasted-in. The material so pulled over, or lasted, is then hammered down, the tops of the pleats and excess material trimmed off, and the middle sole replaced, and tingled down with half-inch tingles. The soling of the shoe can then be proceeded with.

Unrepaired Machine-sewn Shoes.—In the case of a side patch being required on a machine-sewn boot which has not to be repaired by soling, the point of the knife is inserted between the upper and sole, the stitches cut for a distance equal to the extent of the patch, and the edge of the patch forced underneath

by means of the screwdriver. The raised sole is then riveted down.

Other classes of repairs on shoe uppers will be dealt with in the next chapter.

CHAPTER XII

Miscellaneous Operations

The Split-bevelled Clump Sole.—This is a form of soling adopted when the shoe is light in substance, and it is desired to add to that substance with an additional sole which shall not be noticed in wear, and without disturbing the manufacture, or the foundation, of the shoe.

Cutting Out the Sole.—The shoe is placed with the sole downwards on a piece of sole leather which is flesh side uppermost. The point of a pencil is placed close to the edge of the welt at the joint, and drawn around the sole to the opposite joint. The other boot is treated the same way, and the soles cut out exact to the marking made. The waists of the new soles are thinned down to half the substance of the leather, but the boot soles and waists remain untouched.

Tacking on the Sole.—The sole is placed in position, and a long rivet driven in at the centre of the toe and left upstanding, to be withdrawn later. A rivet is likewise driven at the waist, and one at each side of the joint, all left upstanding. The sole is now trimmed quite closely to the edge of the welt, all the way round. The tacking-on rivets are next withdrawn, the sole placed on a board, flesh side up, and a line

made around the edge a quarter-inch inwards from the edge, with the exception of the waist edge. Starting at the joint, a sharp knife blade edge is held at a slant on the line made, and the edge skived forward, so that the extreme edge of the sole is reduced in substance to half its original thickness. The sole is now replaced in its original position on the shoe. A riveting line is now made on the sole, and this line must be in a position a shade farther inwards than the skiving line on the flesh side. The sole is next riveted around on this line, and hammered down.

Finishing the Clump.—The sole edge now receives another trimming, the knife being held at an angle that will permit close cutting to the welt at the upper side, and gradually on the slant inwards to the surface of the sole edge. The sole is now ready for rasping, and it will be seen that there is a space between the edge of the sole and the welt. This is termed the split. When the sole edge has been rasped, scraped, and scoured with glass-paper this split will appear to have closed up, and the next operation is to open it up. This is done by first forcing in the point of the screwdriver, and running it around the edge from joint to joint. Then operate the edge of the smooth side, or file side, of the rasp in the same way. The knap is next filed off the extreme edge of the surface of the sole. Then, a line is drawn around the edge of the surface of the sole a quarter-inch inwards. From this line to the sole edge the leather is slightly reduced, on the bevel, by rasping. The part so treated is then scraped and scoured, and the sole is ready for inking. The edge is set first with the cold iron,

whilst the ink is wet. Just when the ink is drying off the edge is set with the warm iron. Then, the guard of the iron is placed in the split at the joint, and forced around the sole edge to the other joint. The bevel on the surface of the sole edge is now carefully inked round, and, when nearly dry, the warm burnishing iron is applied. This will burnish the bevel, and also give it better form. Rubbing off with the cloth follows, and the operation is complete.

Let-in Toe-pieces.—The worn part of the toe of the sole is cut across squarely. It is then turned back, and skiving is done on the flesh side of the sole under the cut edge. A pattern is now taken for the toe-piece, allowing it to extend half an inch beyond the cut edge of the toe of the sole. This piece is now forced under the sole till it is in the right position at the extreme toe end, that is, the edge of the piece at the toe being flush with the toe of the welt. The knife is now held upright, and a mark made on the new toe-piece by the edge of the cut sole. The piece is removed, and an incision made along the mark, cutting to half the depth of the substance of the material. The knife blade is next held at the cut edge of the toe-piece at midway of its substance, and the material cut through to meet the downward cut made on the surface. The piece so cut is now removed, leaving the toe-piece with a flange. The toe-piece is next fitted in position so that the cut edge of the old sole fits closely in the flange of the new toe-piece. Short rivets are driven here across the cut edge of the old sole, and penetrating the flange of the new toe-piece. The rest of the toe-piece is riveted round, the piece is tapped down, and

the result is a let-in toe-piece with a perfectly level sole surface. If the piece is to be sewn, the channel is cut in the toe-piece after the riveting has been done across the join.

Let-in Side-piece.—Side-pieces are also let in to the sole in a similar way. The pattern of the side-piece is usually of a crescent shape. When the worn part is being cut out of the sole it is cut to this shape. The sole cannot be lifted up to permit turning back, so the under side of the cut edge of the sole is trimmed by placing the knife nearly flat, underneath, and thus under trimming the flesh side. A pattern of the side-piece is now cut to allow half an inch of material to go under the cut edge of the sole with the other edge of the side-piece level with the welt. The side-piece is then marked around by the cut edge of the sole, and prepared, as described for the toe-piece. The side-piece is then fitted in, and riveted or sewn down.

Half-heeling.—This is often resorted to in the case of a wearer who is very heavy on one side of the heel. The operation, as follows, is quite simple. A line is made on the top-piece, just beyond the extent of the worn part. The worn part of the top-piece is then chopped through by means of tapping an old knife. If the lift underneath is also worn, the worn part is chopped out in the same way, and filled in with a piece of scrap leather. This is rounded up, and a pattern cut of the half-heel. In cutting out the half top-piece, the edge which has to go next to the cut edge of the old top-piece should be cut slightly on the bevel, towards the flesh side. This will enable the new piece to bind up closely to the old top-piece.

The half top-piece is now fixed in position and riveted across first, and then around the edge. A row of rivets should also be driven across the cut edge of the old top-piece.

Repairing Broken Wooden Heel.—Though this is simple when it is a plain, uncovered heel, the repair is somewhat difficult when the heel is covered with kid, or other material. In such cases the difficulty is increased by the fact that the heel has a breast flap. This means that the sole of the shoe, instead of being placed under the heel, is thinned down, or split, at that point, and is then carried up the front of the heel, termed the breast, and glued in that position.

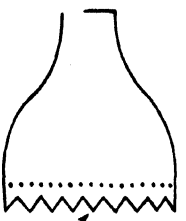
Releasing the Cover.—The first operation is to release the cover of the heel. When the top-piece is removed it will be seen that the continued sole of the shoe is carried, and turned over, on to the top of the wooden heel. This is raised, and pulled away down the front of the heel to just beyond the break. The cover of the heel can now be raised from the top of the heel, and peeled back down to just past the break. The front of the heel is now rested on the edge of the last, or iron foot, an old knife blade placed just below the position of the break at the back of the heel, and the blade given a sharp firm blow with the hammer. The damaged part of the heel should thus be cut clean away. The top of the heel will now require to be rasped level. The next thing is to cut, and shape carefully, leather lifts equal to the amount of the wood heel cut away, and to the exact shape, when fitted together, of the cut part removed.

This has to be done before they are attached to the wood heel, and the work is bound to be accurate or the cover will not fit. The lifts should now be attached singly with short rivets. The flap of the sole should now be given a coat of glue, and placed back in position to the heel. A piece of cord should now be tied around the flap and heel to keep it in position till the glue has set. It is then tingled down on the top of the wood heel, the cover gently peeled back into position, tingled down, and the new top-piece attached.

Looping Broken Uppers.—In cases where the upper is cut, or broken, close down to the welt, an almost invisible repair can be made by the looping process in place of patching, as described in the soling of turn-shoes by the looping method. The stitches are put in the upper rather loosely, and pulled up tightly in the sewing down to the sole edge. If the operation is properly performed, the stitches of the upper should be drawn out of sight in the welt.

Broken Back Linings.—For broken back linings, a pattern should be taken of the back of the upper, and the lower part allowed to extend from heel corner to heel corner. An inch of extra depth should be allowed, to permit turning in around the heel part. Triangular pieces are cut out of the edge of the lining at the heel part. The lining may be of calico, linen, or light kid. A coat of rubber solution is given to the lining cut out, and it is placed in position in the boot so that the cut edge of the heel part may be doubled over and laid on the heel of the inner sole. The vandyke pattern of the edge will facilitate turning over. A tight fitting boot tree is now inserted

in the shoe, and the back of the shoe gently tapped. When the lining is dry, and set, a heel sock should be cut of light kid, pasted, and placed on the heel of the inner sole over the turned-in edge of the lining.



PATTERN OF BACK LINING. SCALLOPED EDGE IS TURNED ON HEEL OF INNER SOLE

Creaking Shoes.—Creaking, or squeaking, of new shoes is usually due to friction caused by the under side of the outer sole rubbing against the surface of the middle sole. This usually happens in the case of machine-sewn shoes with a middle sole. A remedy is to cut the stitches between the outer sole and the middle sole, and force the two open at the joint. French chalk, or powdered black-lead, is then inserted, and the sole sewn down, or riveted down, as the case may be. The action of walking in the shoes will then spread the chalk, or powdered black-lead, over the surface of the middle sole, and stop the creaking.

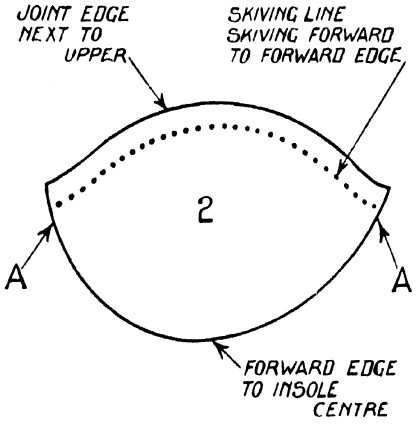
Staining Brown Shoes Black.—If the shoes are of calf, or willow calf, the following is an easy method of staining the uppers black. A coat of liquid ammonia is given to the uppers, followed, whilst the uppers are still wet, with two coats of shoemaker's ink. The shoes are then allowed to dry, brushed up, and given a coat of black polish. This must be allowed to dry

thoroughly before the shoes are again brushed up. After that, the edges of the sole, and the heel, should be scoured with glass paper, a coat of ink applied, and ironed and set, as described in Chapter X. In the case of glace kid, however, this method of dyeing the uppers will not be effective. For glace, and similar uppers, a special dye is used. The best of these are known as " Record," and " Gozin " dyes, and they may be obtained from most leather and grindery shops, in small bottles. The shoes are given two coats with this, and then allowed to get bone dry before polishing.

Excessive Out-treading.—This is usually caused by weak insteps, resulting in the outside joint of the sole being rapidly worn through. The following is a good method to adopt. A piece of very soft leather is obtained, and cut crescent shape. The thickness should be a quarter-inch, and the size of piece cut should measure five inches from corner to corner. The long edge of this leather should be cut to conform with the edge of the inner sole at the joint and left square. From a half-inch inwards from this edge the knife blade should be laid nearly flat, and the piece gradually skived down to a tissue paper substance at the crescent shaped, or half-round, edge. The piece of leather should now be covered with a piece of glace kid. This can be turned underneath the leather piece, and the edges whip-stitched together with a light thread, or stuck down with rubber solution.

The piece is now placed in position in the shoe, and two or three rivets driven through the sole at that position, the rivets being long enough to penetrate

the sole, the inner sole, and the piece of material laid inside the shoe. This will raise the foot of the wearer on the outside tread, and assist in giving a more level tread during the wear of the shoe.



Inside pad for correction of excessive treading. Edge A to A is skived to tissue paper substance gradually from joint edge.

Hints and Recipes

Trimming, or Cutting, Crepe Rubber Soles.—The knife should be dipped frequently in water. If the crepe sole is of very light substance, the edge may be easily trimmed by means of a sharp pair of curved surgical scissors.

Rap Stick, or Knife Sharpener.—The shoemaker's knife needs frequent re-sharpening, and this is best done by the use of emery. A piece of wood, about twelve inches long, two and a half inches wide, and

half an inch thick, is obtained. A strip of emery cloth is cut to fit one side of this board, and pasted on. A strip of calf, or similar leather of a greasy nature, is next cut to fit the other side of the board. This is tacked on at one end of the stick, then pulled tightly, and tacked down at the other end. In sharpening the knife, the blade is laid flat on the emery side of the stick, given a few rubs, then, finally, a few strokes on the leather-covered side of the stick.

Making Fake.—A mixture used in putting a high gloss, or polish, on heels, edges, and sole bottoms after the usual finishing process. It is made, and used, in the following way:

Black Fake.—This is made by taking two black heelballs and one white heelball. These are placed in a small tin, and covered with turpentine. The tin is then held over a gas jet, and heated until the heelballs are dissolved. The contents are then allowed to cool, when the fake is ready for use.

Brown Fake.—The fake for brown shoes is made in the same way as for black, except that two brown heelballs, and one white, are used.

Using Fake.—In applying fake, it is smeared and spread over the heel, sole edge, and bottom after the shoes have been rubbed off with the cloth, following the ironing, after which the coat is allowed to dry. It is then lightly rubbed over with a soft cloth. When the fake is not in use, the lid of the tin should be kept tightly closed or the fake will harden. If the fake should get too thick, a little more turpentine can be added and the tin re-heated. If the fake is too thin, half a heelball should be added.

A Strong Adhesive.—In case of repairing uppers of a greasy nature, the following is a recipe for a proved, strong adhesive.

Obtain two ounces of gutta percha in the sheet, known as tissue gutta. This is rolled up, and twisted, and then cut up in thin slices. These are placed in the inner vessel of an ordinary glue pot. Benzoline spirit is then added to cover the gutta-percha, and the glue pot is placed over a small light. It is essential that the light should be kept small and under the glue pot, as the fumes will fire if the light gets too near the benzoline. The glue pot is left until the gutta-percha has dissolved. The mixture is then stirred up, and it is used hot. The work is prepared exactly as for the rubber adhesives, and a coat given to the prepared parts. This coat is allowed to dry, and, if the mixture has been made right, the coat should dry white. If it dries grey, it is too thin. In that case a little more gutta-percha is added, and the mixture re-heated. If it is too thick, a little more benzoline is added. In uniting the parts, the patch and boot upper are passed rapidly before a lighted gas jet, the treated sides nearest to the light. The white coat will gradually disappear, and when this has completely happened, the parts should then be united at once. Any kind of upper leather may be treated by this adhesive, and also rubber Wellington uppers. Rubber soles may also be attached on Wellington rubber boots by means of this adhesive.

A Strong Paste.—Where adhesives are needed for purposes not necessitating the use of a rubber cement, it is usual for the shoe repairer to use a paste made of

rye flour. A much better, and stronger, paste is now adopted, known as Rex cold water paste. This is a fine, specially treated, flour, which is germ proof, and is of extra strong tenacity. It may be obtained from leather and grindery shops, and from paint and varnish shops. The paste is made by placing a quantity of water in a vessel, and adding the powder to the water. It is a peculiarity of this product that the powder must be added to the water, and not the water poured over the powder. If the latter course is adopted, it will not mix properly. If the former course is followed, it will mix evenly and free from lumps, and be of a creamy, velvety colour and appearance. It may be mixed to any desired strength, and cold water only must be used. It will keep for ten days without going mouldy. Rex paste may be used for sticking socks of leather, or paper, in the shoes, or for attaching linen linings in shoes with torn linings, and other similar operations.

Adhesive Points to Remember.—In using rubber adhesives all grease must be kept away from the work in hand, as grease is fatal to the adhesive properties of all rubber solutions.

If the worker has been handling anything of an oily, or greasy nature, the fingers should be washed, as where the sole, or other leather, is taken hold of with greasy fingers reliable adhesion will not take place.

A great deal of the success in attaching sole leather with a rubber adhesive depends upon the proper roughing-up of the flesh side of the leather. Mere light rasping will not suffice. If a rasp only is used, a circular movement should be adopted in the use of

the rasp. It should be understood that the main idea is not to lay the adhesive on the top of the leather, but to raise the fibre of the leather so that the fibres may be impregnated with the solution, or cement. A better tool for the purpose of roughing-up than the rasp is an old hack-saw blade. This is placed across the surface of the leather, and drawn backwards and forwards with pressure. Another point is that all loose flesh must be removed from the sole before the roughing-up is done. If this precaution is not taken, the result will be that the solution will merely adhere to the loose flesh, and during the wear of the shoe the flesh will part from the fibre of the leather, and the parts will thus separate. Another point of importance in adhesive work is this. Although in sewn, stitched, or riveted work, the leather is worked much easier if damp, in adhesive work the leather must be perfectly dry. If the grain contains moisture, reliable adhesion cannot be expected.

In the case of attaching either a leather or a rubber sole to an outer sole of a shoe which has been worn, it will be necessary to remove all foreign ingredients which may have been picked up by the sole, such as oil from motor traffic, dirt, and grit. To do this, the shoe sole should be washed in a solution of hot water and common soda, then well scraped whilst wet, allowed to stand until nearly dry, and then roughed-up. This process should remove all injurious matters from the sole, and permit reliable adhesion.

Finally, all cheap rubber solutions should be avoided as these are usually highly inflammable, injurious to health, and their qualities of tenacity questionable.

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