Sept. 14, 1937. H. W. LUCAS 2,093,247

RENEWABLE FORE PART SECTION FOR SHOE LASTS

Filed July 18, 1935 2 Sheets-Sheet 1

Fig 1

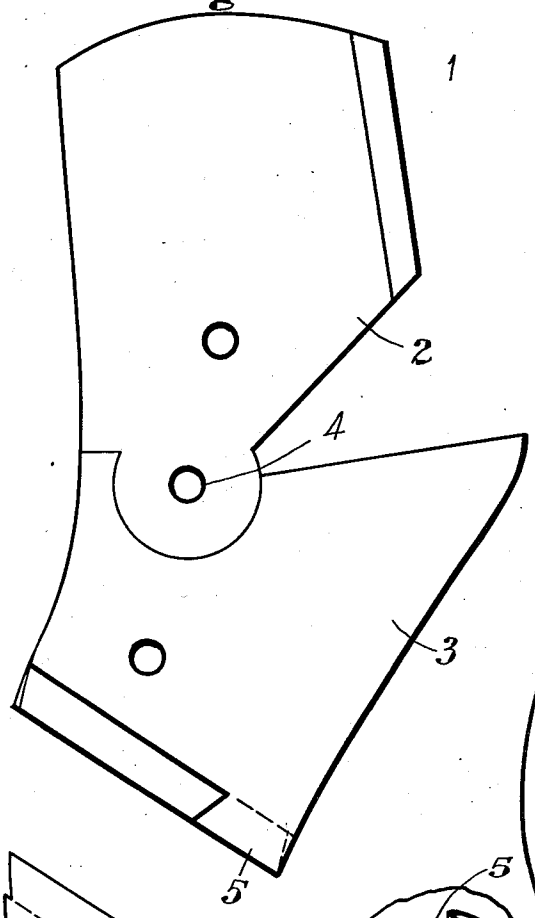
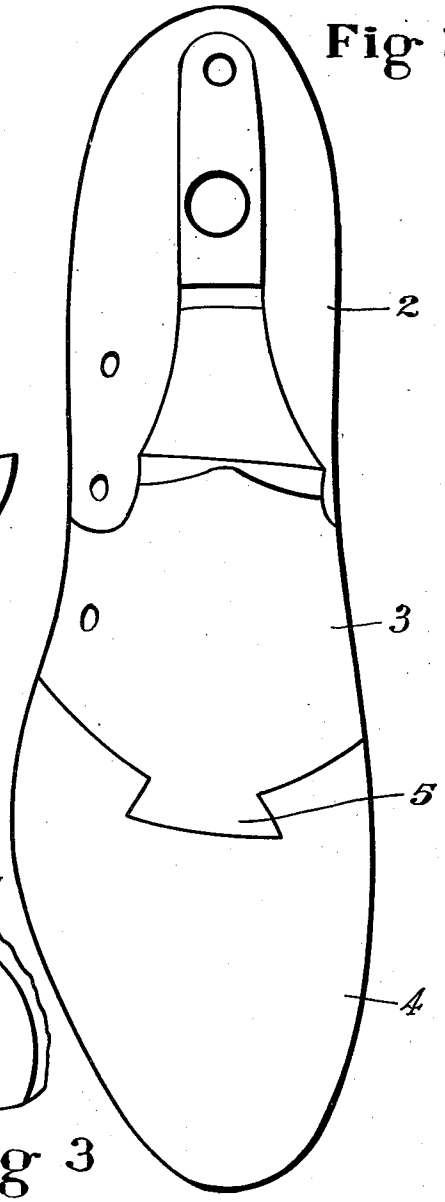


Fig 2



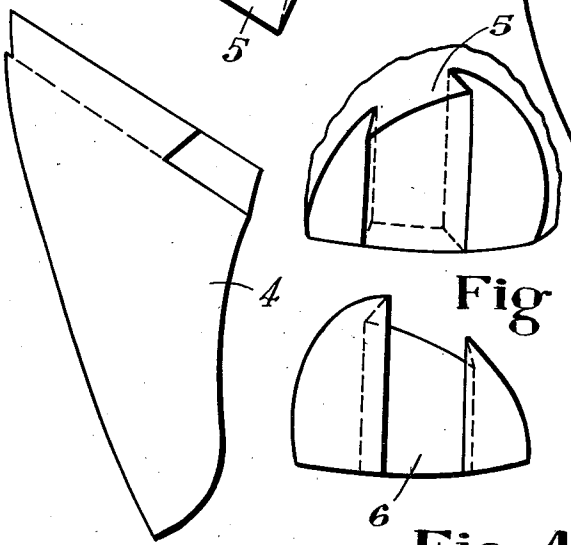


Fig 3

Fig 4

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RENEWABLE FORE PART SECTION FOR SHOE LASTS

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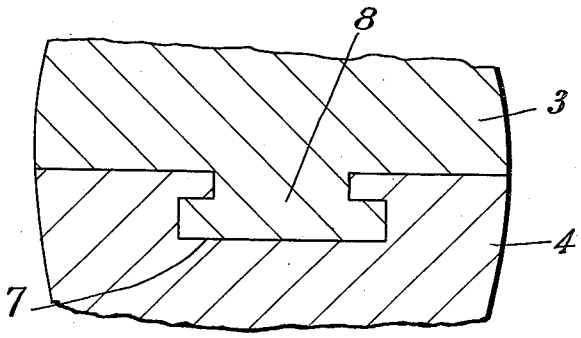


Fig 5

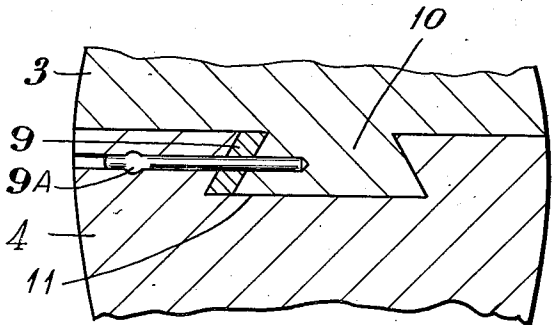


Fig 6

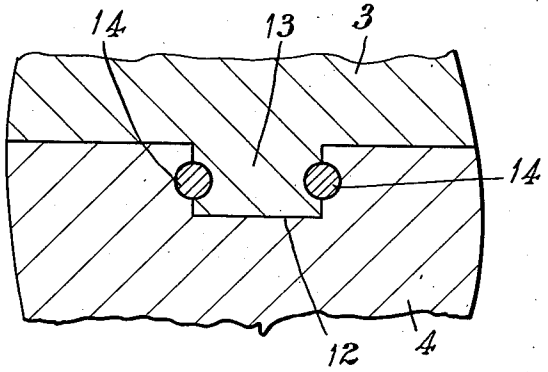


Fig 7

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2,093,247

RENEWABLE FORE PART SECTION FOR SHOE LASTS

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Application July 18, 1935, Serial No. 32,048

3 Claims. (Cl. 12—133)

The present invention relates to a shoe last having a replaceable section in the fore part thereof.

In the manufacture of shoes the item of expense in the purchase of lasts on which the shoes are made represents a substantial portion of the cost of producing the shoe. This is especially true in the contingency of rapidly changing shoe styles, it being known that style change ordinarily affects one part of the last while the remainder of the last stays the same. There are also many other reasons why it is found necessary with the usual type of last to prematurely discard many entire lasts when a part of each last at least might be of further use. It is one object of the present invention to provide means for replacing worn or obsolete portions of a last and retaining the remaining elements thereof for further service.

Shoe styles change frequently which of necessity requires a change in the shape or contour of the last used. In most instances, this change in shape and contour occurs only in the fore or style part of the last, with the back or heel part remaining the same, any change also occurring in the toe of the last from the waist line forwardly. It has hitherto been found objectional to sever the toe portion of the fore part of the last from the remainder since much difficulty was experienced in rigidly securing the new fore part section to the remaining element of the last. The present invention provides an efficient means for attaching the new section to the old section in such a manner that the two sections become practically inseparable during the use of the last.

A further object of invention is to provide means for attaching the portion of the last to be retained in service and a replaced portion together which will present a maximum resistance to separation along the line of greatest stresses set up in the last during the construction of a shoe. Other objects and features of the invention will more fully appear from the following specification in connection with the accompanying drawings and will be particularly pointed out in the claims.

In practicing the present invention, a shoe last which it is desired to modify as to the present size and contour of its fore part is prepared to receive a new toe portion. This is done by severing the toe portion of the last by a straight saw cut, preferably in a plane coinciding with or adjacent to the waist line of the last which lies at an angle to the transverse vertical plane of the last. By severing the last at this point it is possible to replace not only the whole tread portion of the sole but also the ball portion of the last. It will be obvious to those skilled in the art that a complete change of style may be made in a last treated in this manner. Heretofore, it has been found impractical by last manufacturers to replace any but the more or less extreme end portion of the fore part, the replaced portion usually extending from the toe rearwardly along a line extending upwardly and rearwardly to a point on the surface of the last near the top of the instep and not including the fore part tread portion. Such division of the last provided contacting surfaces of relatively large area which could be readily joined by adhesive or other means. The rebuilt last thus constructed retained its original strength but such remodeling did not provide the opportunity for modifying or renewing substantially the entire fore part of the last as may be accomplished by the practice of the present invention.

In the drawings:

Fig. 1 is a side elevation of a shoe last treated in accordance with the invention, and having its fore part separated into two sections.

Fig. 2 is a plan view of the last shown in Fig. 1 with the two sections of the fore part thereof assembled to form a complete serviceable last.

Fig. 3 is a detailed view of one element of the connection between the sections of the fore part shown separated in Fig. 1.

Fig. 4 is a similar illustration showing the other member of the connection.

Figs. 5, 6 and 7 illustrate in cross section modifications of the connecting joint between the two sections of the fore part of the last shown separated in Fig. 1.

To present accurately and understandably the principles of the invention, specific embodiments thereof are illustrated. It is understood, however, that the scope of invention is not restricted to this illustration, but may be practiced to the fullest extent of its scope as set forth in the claims.

Referring to the drawings, a shoe last is shown which includes a back or heel part 2 and toe or fore part 3 connected together by a hinge 4 which provides for the necessary manipulation of the back and fore parts of the last during the manufacture of shoes. After the last has been in service for some time, there are certain portions thereof which receive the greatest wear and tear while the remaining portions still may be used for a much longer period of time. The sole of the fore part receives much of the destructive wear

and tear upon the last due to the fact that it is a common practice to tack the edges of the upper to the sole face of the last during the manufacture of the shoe. This sole face of the last quickly becomes unserviceable due to the accumulation of tack holes in the wood of the last. When the sole face of the last has become unserviceable due to the frequent tacking of the uppers to the sole, the sole face of the last is sometimes again made serviceable by milling or drilling away the unserviceable portions of the sole face and inserting wooden plugs and finishing off the block to present a smooth surface in the plane of the sole face. Such treatment of the last makes it possible to again put the last in service for a limited time, but a last so treated lasts a relatively short period of time and it becomes necessary either to again treat the sole face of the last, which in many cases is impractical, or to renew the entire fore part of the last. Thus, the present invention enables the last to be again renewed and put in service for a period of time substantially equivalent of the life of a new last.

It is present common practice to discard the last entirely when such a condition is present. In analyzing such a situation, it is apparent that a large portion of the fore part and the heel part of the last are still usable. When the whole last is discarded, therefore, this portion of the fore part with the back part constitutes a total loss. To overcome this unnecessary waste, the present invention provides means for salvaging those parts of the last which are still good for a substantial amount of service.

There are, therefore, two main reasons why a last is prematurely discarded, namely, the change of style shape in the fore part and the wearing of the sole face of the last due to rapid insertion of tacks employed to hold the upper in position during the manufacture of the shoe. The waste occasioned by the present practice of discarding the lasts in the event of change of style shape and worn sole faces is prevented by the present invention.

It may occur to those skilled in the art that it would be better practice, in case of a requirement for renewal of the toe portion of the last, to renew the entire fore part at the hinge. Such procedure, however, entails considerable inconvenience and waste of time in reapplying an entire fore part to the old heel part. Furthermore, in attempting to renovate a last in this manner, it will be found impractical to produce a properly fitted bearing surface on the fore part to match up with the bearing surface on the old heel part. In view of the above suggested difficulty, such a method of renewing the last is impractical.

The problem which is met by the present invention is the production of a joint of attachment between the salvaged portion of the last and the replaced toe portion. Such joint may be in the form of a dovetail as shown in the Figures 1 to 4, inclusive. The last which is to be treated has the toe portion **4** of the fore part **3** severed therefrom preferably by a straight saw cut extending in a plane coinciding with or closely adjacent to the waist line of the last and at an angle to the transverse vertical plane of the last. The angle of the saw cut which severs the toe portion from the last is not confined to any definite degree and the cut may be made at any point in the fore part of the last. If it is desired to make a substantial change in the form of the last, the saw cut should be made at the waist, or to the rear of the ball portion of the last. When the new portion is in position ready for finishing, it may therefore be turned to provide a toe portion having any desired characteristics differing radically from the original form of the last.

As shown in the drawings, the tenon portion **5** of the dovetail joint is formed in the fore part **3** while the groove member **6** of the joint is formed in the replaced toe section **4**.

Desirably the surfaces of the joint are spread with a suitable adhesive and the toe section **4** is slipped into place and the cement is allowed to harden. The toe section **4** is preferably in a rough unfinished state when it is applied to the fore part of the last. The last thus fabricated is then fixed in the last turning lathe and the toe portion is turned to the contour of the desired model and the whole last is then finished and made ready for again being put into service.

One of the chief characteristics of the union thus made between the toe section **4** and the remaining section of the fore part **3** is that the material of the fore part **3** interlocks with the material in the toe part **4** in a plane which is at an angle to the transverse vertical plane of the last, thereby offering a maximum of resistance to the usual forces exerted on the last perpendicularly to the transverse horizontal plane thereof during shoe making on the last. Also, forces applied to a hinged type of last to rotate the fore and back parts relatively to each other for last contracting or expanding purposes are applied to the last perpendicularly to the transverse horizontal plane of the last. With the tongue and groove type of connection between the fore part sections disposed angularly to the transverse vertical plane of the last as shown, a joint is provided between the last part sections which is not affected by such applied last contracting or expanding forces.

There are other forms of interlocking joint which may be utilized which have characteristics similar to the simple dovetailed joint already described. Such a joint is illustrated in Fig. 5 in which one of the elements such, for instance, as the toe section **4** which may be provided with a T-slot **7** while the fore part section **3** is provided with a complementary projection **8**. In this construction, the joint is made and constructed in a manner similar to that described in connection to the dovetailed joint.

The simple dovetailed joint may be modified as shown in Fig. 6 by the addition of a gib member **9**. In this construction the tenon portion **10** of the dovetail is slightly less in width than the groove portion **11** and the gib member **9** is forced into the space thus provided. In this manner it is unnecessary to hold the dimensions of the dovetail within such close limits during their formation as is required to make a firm joint but without the use of the gib member **9**. The gib member **9** may be selected from stock having various thicknesses and for a given run of lasts the proper thickness of gib necessary to make a tight joint is readily determined. By selecting the proper thickness of gib and driving it into the joint with considerable force, a joint may be produced which may be made permanent with a very light application of cement or possibly with no cement. In such construction, it would be a simple matter to remove the gib **9** and readily free the joint and thereby make way for attaching an indefinite number of toe sections. The joint may also be made secure by driving a nail or pin **9a** at the joint and through the gib.

Still another form of joint is illustrated in Fig.

7 in which one of the fore part sections such, for instance, as the section 4, is provided with a groove 12 while the other section of the fore part 3 is provided with a complementary projection or tenon 13. Interlocking key means are provided desirably in the form of a pair of dowels 14 which are driven into the joint at the side walls of the groove and are received in suitable apertures formed in the side walls of the tenon member 13 and the groove 12. In this construction, similar to the construction shown in Fig. 6, provision may be made for removing the dowels 14 thereby freeing the joint and providing means of indefinitely renewing the toe portion 4. The dowels constituting the key means may be of any desired cross sectional form.

In addition to the advantages already pointed out, the practice of the present invention results in great economies in the purchase of lasts since when the trade demands a change of shoe style, the present supply of lasts may be rebuilt under the principles of the invention to conform with the new style, thereby not only preventing the tremendous waste incurred in discarding all of the lasts but provides a means for economically supplying the demands of the trade by re-designing those lasts which are already in the possession of the manufacturer, thereby avoiding the necessity of purchasing additional lasts.

It should be borne in mind that the advantages of the invention apply not only to the type of last herein specifically described, but to any type such as a solid one-piece last or that type of last which has no flexible joint but is provided with a removable portion to permit it to be withdrawn from the shoe.

Having thus described the invention, I claim:

1. A shoe last comprising a heel part, a two section fore part, a flexible joint between said parts to permit manipulation of the last, a dovetailed joint between said fore part sections, a removable gib member in said joint and a locking means extending laterally into the material of the fore part and through said gib.

2. A rebuilt shoe last comprising a heel part and a fore part hinged one upon the other for movement into last expanded and last contracted position, a replaced toe portion permanently secured to said fore part and extending from the tip of the toe rearwardly to a plane at or adjacent the waist of the last and a dovetail joint connecting the replaced toe portion to the last said joint being formed in the material of the last whereby the material is caused to interlock at the joint to produce a union of maximum strength.

3. In a rebuilt shoe last having a back part and a fore part hinged one upon the other for manipulation into last expanded or last contracted position, a replaced toe portion extending from the tip of the toe to a plane at or adjacent the waist of the last, a dovetail joint extending completely across said plane, said joint interlocking within the material of the last to an extent substantially less than its length across said plane.

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