Jan. 6, 1942. C. W. BAKER 2,268,561

WELT SHOE AND INSOLE THEREFOR

Filed Nov. 27, 1939

Fig1

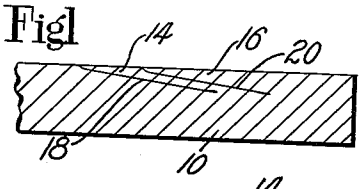


Fig2

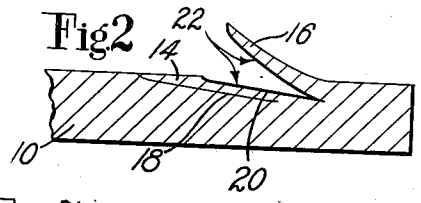


Fig3

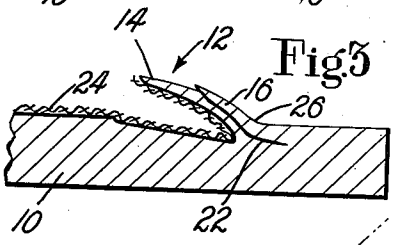


Fig4

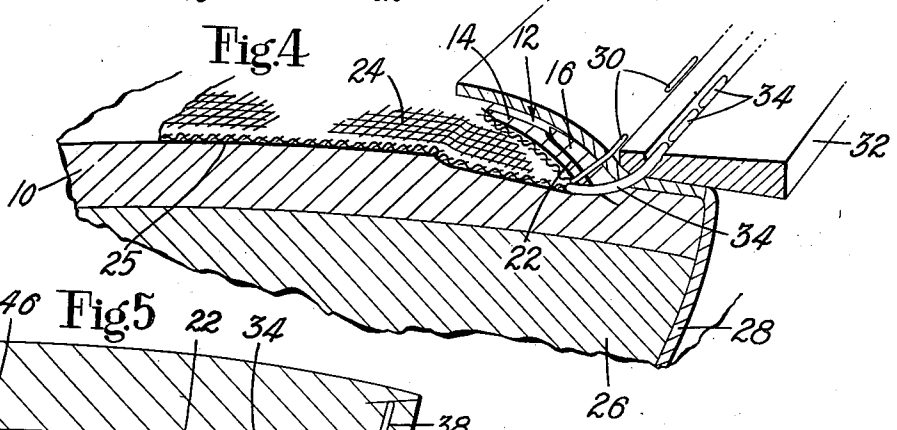


Fig5

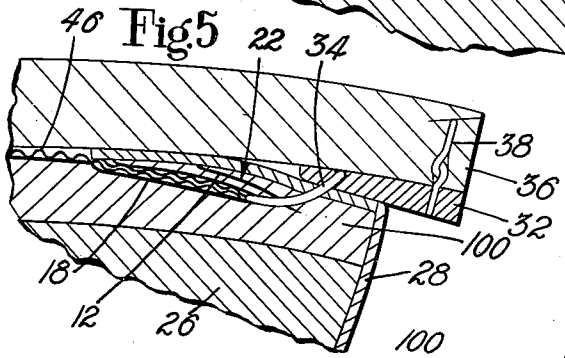


Fig6

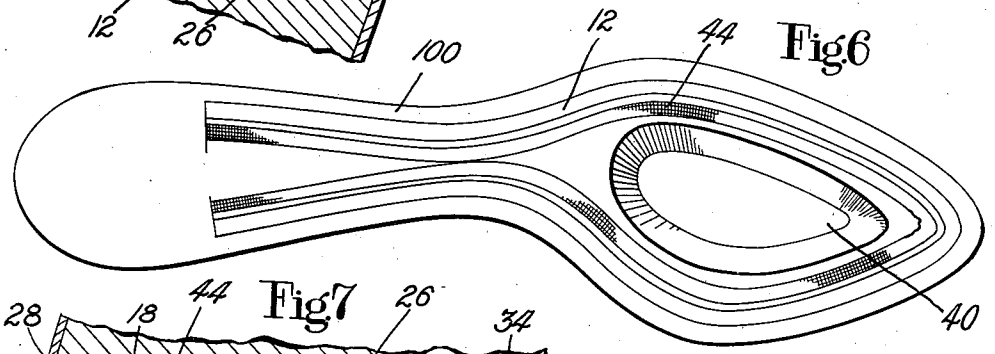
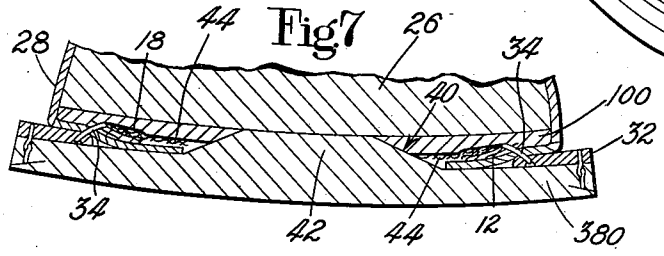


Fig7



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WELT SHOE AND INSOLE THEREFOR

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Application November 27, 1939, Serial No. 306,235

10 Claims. (Cl. 36—17)

This invention relates to improvements in shoes and insoles therefor.

In the manufacture of insoles for welt shoes it is customary to cut inwardly from the sole edge to form an outer marginal channel lip and a feather, to cut downwardly and outwardly into the surface of the insole along a line spaced inwardly from the sole edge to form an inner marginal channel lip, and to raise these lips into upstanding positions in which they lie side by side so as to form a double lipped sewing rib which is substantially perpendicular to the surface of the insole. In lasting a shoe having an insole of this type, the rib of the insole has a tendency to bend outwardly under the influence of the lasting strains so as to relieve the tension of the upper and cause the upper to be improperly shaped to the last. After the lasting has been completed, the upper and the welt are secured by inseam stitches to the between substance at the base of the insole rib, the inseamed materials are trimmed, and the bottom cavity inside the rib is filled with suitable filling material. The trimmed rib, however, still remains substantially perpendicular to the insole and offers a very substantial amount of resistance to such bending of the insole as must necessarily take place when the shoe is flexed in walking. Moreover, in a rib of this type the between substance extends above the feather and not infrequently has given way under the pull of the upper in the wearing of the shoe so that the shoe has been damaged beyond possibility of being successfully repaired. In the case of thin insoles, such as are commonly used in women's flexible sole shoes, it is not practicable to prepare the insoles in the manner above described inasmuch as the cutting of the outer channel results in the production of a feather of such reduced thickness that it will not afford the necessary internal support for that portion of the upper which is located immediately above the welt and consequently cannot be depended upon to preserve the shape or outline of the upper in that locality. Attempts have been made to provide a rib of sufficient thickness without unduly weakening the insole as, for example, by channeling the insole lightly and reinforcing the upturned channel lip or lips by means of tapes or otherwise to provide the necessary thickness of between substance, but such constructions have been expensive and generally unsatisfactory.

For the purpose of overcoming the above-mentioned difficulties in the manufacture of insoles for welt shoes, I have devised an insole having a double-lipped sewing rib of novel and improved construction comprising the turned-up lips of two inside channels, a construction which results in no reduction of the edge thickness of the insole. The lips are formed integrally with the insole and preferably are adhesively secured together to form a unitary rib of laminated formation. In forming the rib the lips are disposed so that they extend inwardly and upwardly from their base portions and thus the rib tends to lie down in a direction which affords the greatest resistance to lasting strain. As illustrated, the channel cuts which form the lips are shallow and they extend substantially parallel to one another and to substantially the same depth, the arrangement being such that the between substance through which the inseam stitches are to extend consists of the roots or base portions of both lips. Thus, without cutting into the sole more deeply than necessary to form a single lip, two lips are formed and when these lips are turned up a sewing rib is produced the thickness of which at its base portion is substantially greater than the depth of the channel cuts. Thus, without weakening the insole by cutting deeply into it an ample thickness of between substance is provided to insure a secure anchorage for the inseam stitches. Because of the shallowness of the channel cuts and the fact that they are made without reducing the thickness in the edge portion of the insole, it will be apparent that unusually thin insoles may be employed without sacrificing the wearing and shape retaining qualities which are generally characteristic of welt shoes. After the inseam stitching operation has been completed, the rib is laid substantially flat upon the body portion of the insole and thus it will offer no resistance to bending or flexing of the shoe bottom and little, if any, bottom filler will be necessary to compensate for irregularities of bottom contour.

My invention will now be explained with reference to the accompanying drawing which forms a part of this specification and in which—

Fig. 1 is a fragmentary cross sectional view of an insole for a welt shoe showing the insole as it appears after the channel lips have been formed but before they have been raised and secured together to form a sewing rib;

Figs. 2 and 3 are views similar to Fig. 1 but illustrating further stages in the formation of the sewing rib;

Fig. 4 is a view, partially in cross section and partially in perspective, of a welt shoe in the process of construction showing the shoe as it

appears at the completion of the inseam stitching operation;

Fig. 5 is a fragmentary cross sectional view of the shoe as it appears after the outsole has been attached;

Fig. 6 is a plan view of a skeleton insole constructed in accordance with my invention, the view showing the ribbed side of the insole; and

Fig. 7 is a cross-sectional view of a completed shoe embodying the skeleton insole shown in Fig. 6.

As best shown in Figs. 3 and 4 of the drawing, **10** designates an insole which is provided, in accordance with my invention, with a sewing rib **12** of novel construction, the advantages of which will be apparent from the following description. The rib **12** comprises two lips **14** and **16** which, as illustrated in Fig. 1, may be formed by cutting two parallel or substantially parallel inside channels **18** and **20** in the bottom surface of the insole at a slight angle to the surface, the two channels being quite shallow and being spaced only a short distance apart so that the lips **14** and **16** are rather thin and may be readily turned upwardly into rib-forming positions and the turning of the lips will have no tendency to result in undesirable guttering of the insole. The channels may be cut by means of an insole channeling machine of a conventional type having suitably shaped channeling knives appropriately positioned therein. After the channels **18** and **20** have been formed in the insole, the uppermost channel **20** is opened, as shown in Fig. 2, and a layer or coating of cement **22**, for example rubber latex, is applied to the surfaces formed by the channel, i. e., to the lower surface of the lip **16** and to the corresponding portion of the upper surface of the lip **14**. Thereafter the lowermost lip **14** is raised and the two lips **14** and **16** are pressed together so that they become permanently secured together by the cement and thus form a unitary lip of laminated formation which is integral with the material of the insole, and which, because of its laminated structure, is substantially stronger than a rib of the same weight and thickness formed by a single channel lip. Preferably a layer of reinforcing fabric **24**, such as canvas or duck, is cemented to the channeled surface of the insole, the margins of the fabric being cemented to the inner or lower side of the rib so as to reinforce the latter. The cement is indicated in the drawing at **25** and, as shown, the fabric **24** is created or fitted closely into the sharp angle at the base of the rib to insure that the inseam stitches will extend through the fabric. During the initial pressing together of the lips **14** and **16**, or preferably later during reinforcing of the rib by means of the layer of fabric, the rib is advantageously molded or otherwise formed or shaped so as to impart thereto a somewhat curved cross-sectional contour substantially as shown in Fig. 3 and to form a well-defined shoulder **26** at the base of the outer side of the rib. This molding or forming operation also sets the rib substantially in the position in which it appears in Fig. 3, so that the rib slopes inwardly and upwardly from its base portion at a substantial angle to the perpendicular and the channel beneath the rib is left open sufficiently to facilitate the performance of the inseam stitching operation. The rib is of three-ply construction consisting of two lips, formed integrally with the body of the insole, and a third ply of reinforcing fabric, all of which are cemented together so that the rib is exceptionally strong for its weight or thickness and further that, due to the inward and upward inclination of the rib, it will be better adapted to resist lasting strains than would be the case if the rib were disposed in the customary perpendicular relation to the surface of the insole. It will be appreciated that the inwardly inclined rib will naturally offer a minimum amount of resistance to flexing of the insole, so that the insole may be readily conformed to the lengthwise curvature of the last bottom. At the same time the rib will offer greater resistance to lasting strain than would be the case if the rib were disposed in the customary perpendicular relation to the surface of the insole. Moreover, the channeling of the insole does not result in reducing the thickness of the edge portion of the insole. Consequently, even if thin insole stock is employed, the marginal portions of the insoles will have the required strength and will have no tendency to buckle or become distorted during the wearing of the shoe but will function effectively in preserving the shape of the upper in the vicinity of the welt crease and holding the upper in the desired close relation to the welt.

It is to be noted that the double lipped rib herein illustrated is formed without cutting deeply into the insole and that the rib is heavier and stronger than any single lip rib which could be formed without cutting more deeply than herein shown. This will be apparent when it is realized that if only a single channel cut is made in an insole to the same depth as that of the cuts **16** and **18** (Fig. 1), the thickness of between substance available at the base or root of the lip formed by that single cut would be substantially less than the thickness of between substance provided in accordance with this invention by the making of two channel cuts each of the same depth as the single channel cut. This is because of the fact that the thickness of the lip formed by the second cut would be added to that of the lip formed by the first cut. For example, if only the cut **20** shown in Fig. 1 were made, the thickness of the between substance through which the inseam stitches would pass would be the thickness of the base portion of the upturned lip **16** (Fig. 3). By cementing a second lip to the lip **16** the thickness of the sewing rib thus produced (and the thickness of the between substance at the base of the rib) will be increased an amount equal to the thickness of the second lip. It will be apparent, therefore, that if the channel which forms the second lip extends no more deeply into the insole than that which forms the first lip, the cutting of the second channel will involve no further weakening of the insole while, on the other hand, the strength of the rib will be very substantially increased. In other words, the additional thickness of the rib is provided by insole stock taken widthwise rather than depthwise of the insole. Obviously then, my invention is particularly applicable to thin insoles, such as insoles of a thickness of 2½ to 4 irons which could not be channeled deeply enough to form thereon a single lip rib of a thickness comparable to that of the double lipped rib herein shown.

While my improved sewing rib has been shown herein as being further strengthened by means of a layer of reinforcing canvas **24** or the like, it is to be understood that the use of this reinforcing material is not essential to the invention and that, if desired, the reinforcing layer may be dispensed with.

In making a shoe embodying my improved insole, the insole is tacked in place upon the bottom of a last **26** (Fig. 4), an upper **28** is tensioned over the last and its margin secured in overlasted position upon the insole, as by means of staples **30**, which may be driven through the reinforced sewing rib **12** by means, for example, of a staple side lasting machine of the type disclosed in United States Letters Patent No. 1,731,853, granted October 15, 1929, upon an application of George Goddu. During the insertion of the staples the sewing rib will not be distorted by the strains incident to the lasting operation but will be retained substantially in the position imparted to it as the result of the molding operation. A welt **32** is stitched to the upper and to the rib of the insole by means of inseam stitches **34** which, as shown in Fig. 4, extend through the roots or base portions of both channel lips **14** and **16** and through the reinforcing canvas **24**. Preferably the inseamed materials comprising the sewing rib and the overlasted margin of the upper are left untrimmed and are laid by pounding or otherwise substantially flat upon the adjacent insole surface, as indicated in Fig. 5. The pounding down or flattening of the sewing rib tends to tip the staples **30** to positions more nearly perpendicular to the plane of the insole, thereby exerting an advantageous tightening effect upon the upper. After the rib has been flattened, as described, a substantially flat or level bottom surface is provided for the reception of an outsole, there being no bottom cavity to be filled and practically no surface inequalities so that little or no bottom filler need be employed. An outsole **36** is then laid and attached to the welt **32** in any well-known manner, as by means of outseam stitches **38**. The fact that the plies of the inseamed materials, including the upper, and the several plies of the sewing rib lie in planes substantially parallel to that of the shoe bottom contributes to the flexibility of the shoe since these plies have no appreciable tendency to stiffen the shoe bottom but are free to bend or flex readily with the inner and outer soles to accommodate the flexing movements of the foot. The substantially flat position of the sewing rib adapts it most effectively to resist the pull of the upper. The thickness of the rib, due to its double lip structure, will insure a firm anchorage for the inseam stitches. Inasmuch as the marginal portion of the insole has not been reduced in thickness, it will back up the between substance at the base of the sewing rib against the pull of the inseam stitches, thus insuring against possibility of the rib giving way. Furthermore, since the edge portion of the insole retains the original weight and thickness of the insole stock, it will not buckle or curl up but will adequately function as an outline or "feather line" preserving element, insuring that the portion of the upper in the vicinity of the welt crease will retain its shape throughout the life of the shoe. The shoe, moreover, will be exceptionally light and flexible, the shallowness of the channeling permitting the use of unusually thin insoles without sacrifice of strength in the sewing rib and the disposition of the sewing rib substantially in the plane of the insole, together with the absence of the usual bottom filling material insuring exceptional flexibility in the forepart of the shoe bottom.

Further to enhance the flexibility and to improve the wearing qualities of the shoe I may employ an insole having a skeletonized forepart and a complemental outsole of the type disclosed, for example, in United States Letters Patent No. 2,012,914, granted August 27, 1935, upon application of Fred Maccarone. Accordingly, in Fig. 6, I have shown my invention as embodied in an insole **100** of this type, the insole having a forepart opening **40**, and in Fig. 7 I have shown a shoe having such a skeleton insole and having an outsole **380** provided with a forepart projection **42** which is complemental to and is fitted within the insole opening **40**. In the insole shown in these figures the construction and arrangement of the sewing rib **12** is the same as that already described except that the rib is reinforced by means of a narrow strip or tape **44** of fabric or the like which is folded lengthwise and cemented to the inner side of the rib and to the adjacent channeled surface of the insole. As shown, the tape **44** extends inwardly a short distance beyond the channel **18** but it does not extend over any portion of the opening **40**. Thus, when the outsole projection **42** is received within the insole opening, the upper surface of the projection will be flush with the surface of the insole and there will be no reinforcing fabric exposed to view to detract from the appearance of the interior of the shoe.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An insole having an edge portion of full insole thickness and having two marginal lips disposed one above the other, the lips being integral with the insole and extending inwardly from said edge portion and being secured together to form an inwardly inclined sewing rib of unitary laminated formation, said insole having a channel beneath said rib forming in that region an insole body portion of substantially less than full insole thickness.

2. An insole having two inner marginal channels forming two marginal channel lips disposed one above the other and having a marginal portion outside said channel lips of full insole thickness, and a layer of adhesive material interposed between said lips and securing them together, thereby forming a reinforced sewing rib of unitary laminated formation.

3. An insole having a sewing rib of unitary laminated formation comprising the lips of two inner channels extending obliquely to substantially the same depth into the insole material, said channel lips being upturned and secured together to form a rib having a thickness at its base portion which is substantially greater than the depth of said channels and said insole having its edge portion of full insole thickness.

4. An insole having two inner marginal channels of substantially the same depth forming two channel lips disposed one above the other, the lips extending inwardly from their base portions and being secured together to form a sewing rib of unitary laminated formation, and a layer of reinforcing material secured to the inner side of said rib and to the adjacent surface of the insole.

5. An insole formed with a central forepart opening and having two inner marginal channels of substantially the same depth forming two channel lips disposed one above the other in the shank and forepart of the insole, the lips extending inwardly from their base portions and being secured together to form a sewing rib of unitary laminated formation, and a strip of reinforcing fabric cemented to the inner side of said rib and to the surface portion of the insole

adjacent to said rib along the shank and forepart of the insole, the inner edge of said strip being spaced outwardly from the insole opening.

6. In a shoe, an insole having an edge portion of full insole thickness and having two marginal lips disposed one above the other, the lips being integral with the insole and extending inwardly from said edge portion and being secured together to form a sewing rib of unitary laminated formation, and an upper having its margin attached to said rib, said insole having a channel beneath said rib forming in that region a reduced insole body portion of substantially less than full insole thickness, and said rib and said attached upper margin closely overlying said reduced insole portion in planes substantially parallel to the surfaces of the insole with the outer side of the rib substantially flush with the adjacent surface of the insole.

7. An insole having an edge portion of full insole thickness and having a two-ply sewing rib consisting of the upturned lips of two inside channels extending to substantially the same depth into the insole material, and a layer of reinforcing material secured to the inner side of said rib and to the adjacent surface of the insole.

8. An insole having an edge portion of full insole thickness and having a two-ply sewing rib consisting of the upturned lips of two inside channels extending to substantially the same depth into the insole material, the thickness of said rib at its base portion being substantially greater than the distance below the surface of the insole to which said channels extend.

9. An insole having an edge portion of full insole thickness and having two inside marginal channels extending from the bottom surface of the insole toward said edge portion, said channels being disposed one above the other and extending to substantially the same depth into the insole material.

10. In a shoe, an insole having an edge portion of full insole thickness and having two marginal lips disposed one above the other, said lips being integral with the insole and extending inwardly from said edge portion to form a two-ply sewing rib and said lips being formed by two inside channels which extend to substantially the same depth into the insole material, and an upper having its margin attached to said rib, said channels forming in the region beneath said rib a reduced insole body portion of substantially less than full insole thickness, said rib and said attached upper margin closely overlying said reduced insole portion in planes substantially parallel to the surface of the insole with the outer side of the rib substantially flush with the adjacent surface of the insole.

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