March 23, 1937. C. A. BEARCE ET AL 2,074,356

MANUFACTURE OF SHOE UPPERS

Filed Dec. 31, 1934 2 Sheets-Sheet 1

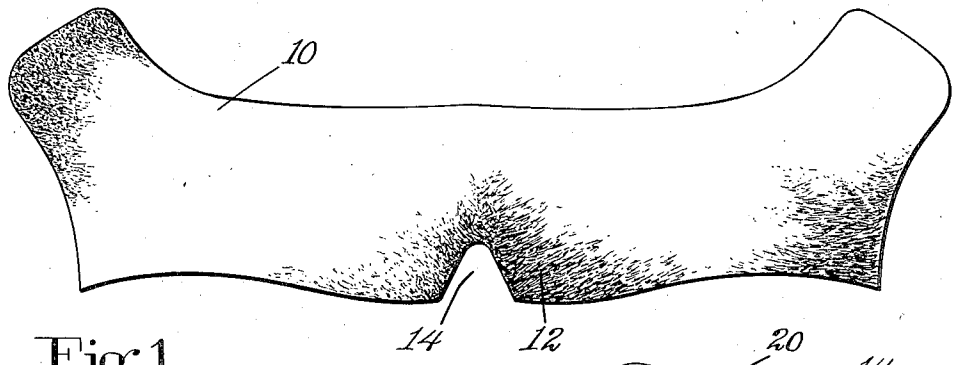


Fig. 1.

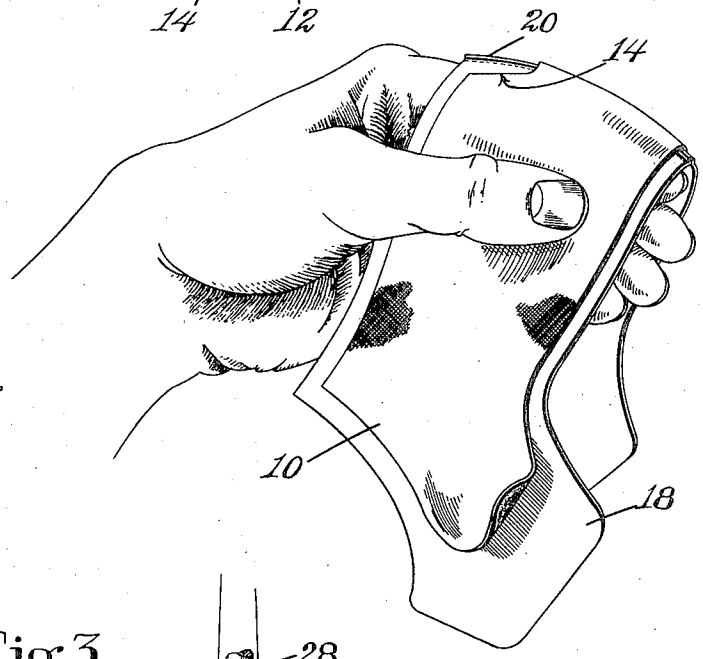
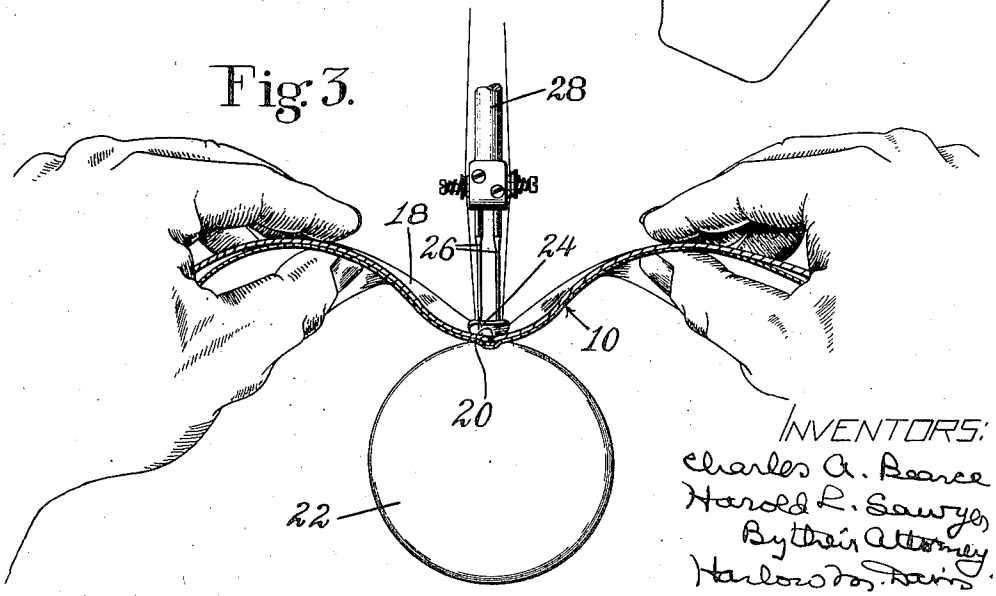


Fig. 2.

Fig. 3.



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Fig. 4.

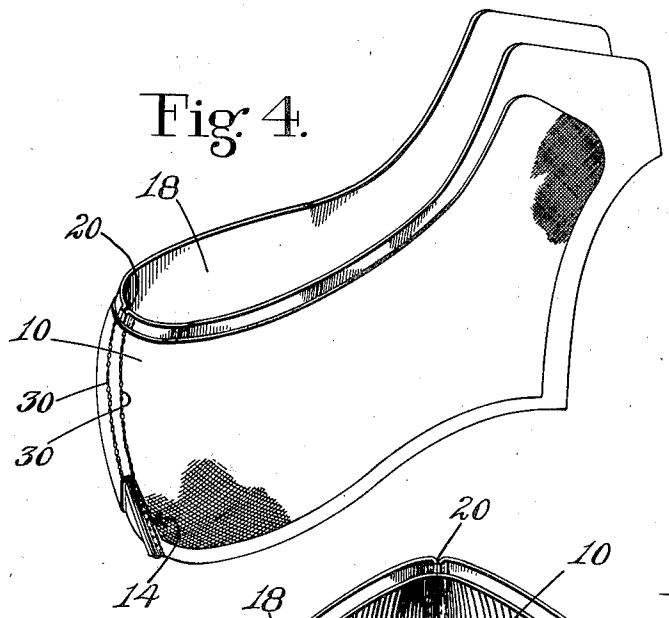


Fig. 6.

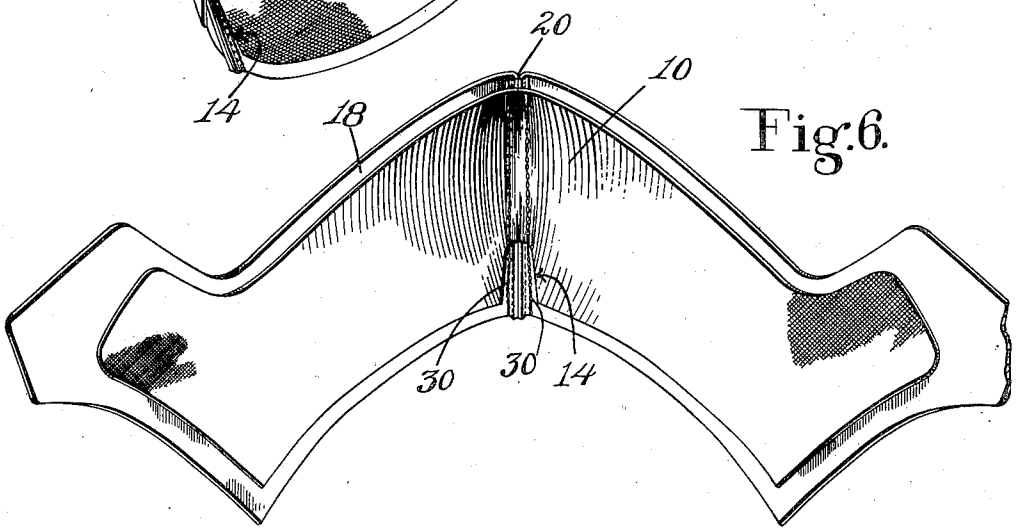
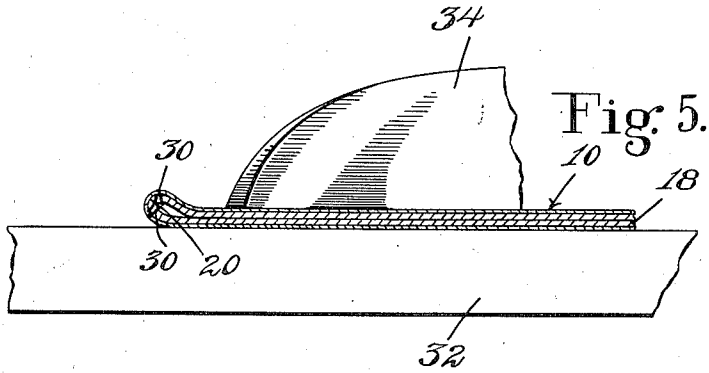


Fig. 5.



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UNITED STATES PATENT OFFICE

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MANUFACTURE OF SHOE UPPERS

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Application December 31, 1934, Serial No. 759,892

7 Claims. (Cl. 12—146)

This invention relates to the art of making shoe uppers and more particularly to methods of securing linings to quarters and to improvements in quarters and quarter linings as articles of manufacture.

The quarter or rear portion of a shoe upper as customarily constructed comprises an outer member of upper material, such as leather, usually comprising two pieces the rear edges of which are secured together by a back seam, an inner lining (or inner lining members which constitute the lining proper) which is frequently also made of leather, and a secondary lining element usually referred to as a backing or doubler and sometimes also designated a counter pad which is interposed between the lining proper and the outer quarter member. This intermediate lining or doubler is often made, like the outer member, in two pieces which are secured together by a back seam and frequently the doubler is secured by means of cement or other adhesive to the inner surface of the outer quarter member. The quarter, of course, must be shaped to conform to the natural heightwise curve of the inside of the heel portion of the shoe in which it is incorporated. In other words, the finished quarter must have a substantially spherical curvature inwardly concave heightwise of its middle portion which is to be located at the extreme rear of the heel of the shoe. Various plies of the quarter must necessarily be stretched more or less to impart the desired spherical curvature to the rear portion of the quarter. Much difficulty is experienced in imparting a required uniform curvature to the various plies of the quarter in its rear portion so as to insure that the latter shall be free from wrinkles and ridges in the finished shoe. This difficulty is increased because of the fact that in cases where the outer quarter members are cut in two pieces and stitched together by a back seam the stitching takes place while the outer quarter members are superposed with their outer grain surfaces in engagement, in other words, while the quarter is inside or "wrong" side out. Also, the lining and the doubler are assembled with the outer member while the latter is still inside out. Thereafter, the assembly has to be turned right side out with the result that the portions in the vicinity of the back seam where the parts were outwardly convex lengthwise of the seam when the assembly was wrong side out become inwardly concave at the wrong side of the assembly, while those portions which before turning were inwardly concave at the right side of the assembly become outwardly convex after turning at that side. As a result of the turning operation the plies of the quarter are very liable to become wrinkled both at the inner and outer sides of the assembly in the immediate vicinity of the back seam, the wrinkles at the outer side detracting from the appearance of the shoe while those upon the inside tend to cause discomfort to the wearer of the shoe.

One object of the present invention is to insure that the various plies or layers of the quarter portions of shoe uppers shall be free from all objectionable wrinkles or ridges both inside and outside in the vicinity of their curved rear portions.

With this object in view, the present invention provides an improved method of making shoe uppers which involves securing a one-piece lining or doubler to a quarter while the parts are assembled wrong side out by means of stitching which extends heightwise of the quarter and is located substantially midway between the forward ends of the quarter in that portion which is to constitute the rearmost portion of the upper in the finished shoe and which serves very effectually to prevent the formation of wrinkles or ridges in either the quarter or the lining when the assembled parts are turned right side out. As herein exemplified, the quarter is cut in two pieces the rear edges of which are curved, as usual, to correspond to the curvature at the back of the heel portion of a last and these pieces are secured together by a correspondingly curved back seam and the lining or doubler is attached to the quarter and shaped to the curve of the back seam by two lines of stitching which are located closely adjacent to and at opposite sides of the back seam. The lining is secured by means of adhesive to the quarter at all other portions of the latter.

Considered in another aspect, invention is to be recognized as residing in an improved article of manufacture which is herein illustrated as consisting of a shoe upper quarter comprising two pieces of upper material secured together by a back seam and a doubler secured to the quarter by means of adhesive and, in addition, by two lines of stitching arranged at opposite sides of and located closely adjacent to the back seam. Preferably, and as illustrated, the lower marginal portion of the doubler (which is to be secured in overlasted relation to the insole) is quite deeply notched so that the stitching may be extended into the lower portion of the quarter without securing the lower portion of the doubler thereto,

such treatment having been found to facilitate satisfactory overlasting of the lower margins of the quarter and the doubler on the rear portion of the heel-seat surface of the insole.

The invention will be explained with reference to the accompanying drawings, in which

Fig. 1 is a plan view of a one-piece quarter lining or doubler used in the practice of our improved method;

Fig. 2 is a perspective view of a two-piece quarter and a one-piece quarter lining or doubler as they appear after having been assembled wrong side out but before the doubler has been secured to the quarter;

Fig. 3 is a front elevational view of a double-needle sewing machine illustrating the operation of stitching the doubler to the quarter at the opposite sides of the back seam in the quarter, the work being shown in section;

Fig. 4 is a perspective view of the quarter and the doubler as they appear after having been stitched together but before having been turned right side out;

Fig. 5 is a sectional view of the quarter and doubler assembly, illustrating the manner in which the parts are subjected to heat and pressure for the purpose of causing the doubler to adhere to the quarter; and

Fig. 6 is a perspective view of the quarter and the doubler as they appear after they have been stitched and adhered together and turned right side out, the view showing the inner surfaces of the parts.

Referring to the drawings, the quarter lining or doubler **10** comprises a single piece of woven fabric having a napped surface **12** upon one side and having on the outer or free portions of its napped fibers separate or discrete particles of thermoplastic adhesive adapting the doubler to be adhered to the inner surface of a quarter by the application of heat and pressure to the parts, a woven fabric having a napped surface treated with thermoplastic adhesive of the type described being disclosed in United States Letters Patent No. 1,931,612, granted October 24, 1933, upon application of H. Kahlmeyer. The one-piece doubler **10** is shaped in marginal outline to adapt it for assembly with a quarter with the edges of the doubler corresponding in outline to that of the edges of the quarter but being spaced inwardly somewhat from the latter. As shown, an open, substantially V-shaped notch **14** is provided in the central portion of the lasting allowance of the doubler, that is, the margin which is to be overlasted upon the insole of the shoe, this notched formation being adapted to prevent wrinkling and overlapping of the doubler material and resulting unevenness of the quarter where the lasting allowance of the doubler and the quarter are overlasted upon the insole in the heel-seat portion of the shoe.

In carrying out my improved method, the quarter or rear portion of a shoe upper, herein shown as a two-piece quarter **18**, the pieces of which have convexly curved rear edges which are secured together by a similarly curved back seam **20**, and a one-piece quarter lining or doubler, such as the doubler **10**, are first loosely assembled, for example, as illustrated in Fig. 2, wherein the quarter is shown as being supported wrong side out by the hand of an operator and with the doubler lying over the quarter. Fig. 2 also shows clearly the curve of the rear edges of the quarter and the curve of the back seam which unites the rear edge portions of the quarter, which curves correspond to the heightwise curve at the rear extremity of a last. During this initial assembling of the parts the operative properly positions the doubler relatively to the quarter with the middle portion of the doubler overlying the back seam of the quarter. The notch **14** in the doubler is of substantial assistance to the operative in thus positioning the doubler. Care is also taken to see that all portions of the doubler lie smoothly and that the edges of the doubler are properly located relatively to the corresponding edges of the quarter.

With the doubler and the quarter held securely by the hands of the operative in their proper relative positions, the end portions of the assembly are opened up somewhat as indicated in Fig. 3, the parts still being wrong side out, however, and the assembly is presented in this position to a double-needle sewing machine of the type of that disclosed, for example, in United States Letters Patent No. 1,236,739, granted August 14, 1917, upon application of G. E. Molyneux, such a machine, as shown in Fig. 3, comprising a horizontally disposed work supporting horn **22** (which is shown in end elevation in the drawings) which contains the work feeding instrumentalities, a presser foot **24** between which and the horn the work is introduced, and two needles **26** which are carried by a vertically reciprocable needle bar **28**. The assembled quarter and doubler are fed past the needles **26** in the direction of the length of the back seam **20** while the work is guided by the operative so that the doubler is stitched to the quarter by two lines of stitching **30, 30** (Fig. 4) which are located close to and at opposite sides of the back seam **20** and which serve to shape the doubler to the curve of the back-seamed rear edge portions of the quarter. As shown, the lines of stitching **30** extend from the top to the bottom of the quarter although the notch **14** in the doubler is wider than the distance between the lines of stitching so that the stitching does not engage the lasting allowance of the doubler but leaves it free to adjust itself relatively to the quarter in the vicinity of the back seam so as to facilitate smooth lasting of the quarter in that locality. The doubler **10** now being held securely against accidental displacement relatively to the quarter by the lines of stitching **30**, the assembly, still wrong side out but with those portions at opposite sides of the back seam disposed in overlying relation to each other, is laid upon a flat surface, such as the surface of the table **32** (Fig. 5) and pressed by means of a heated tool, such as the flat iron **34**. After one side of the assembled quarter and doubler has been acted upon by the flat iron the parts are turned upside down upon the table **32** and the opposite side of the assembly is acted upon by the flat iron.

The heat of the iron **34** renders sticky the particles of adhesive upon the napped fibers of the doubler while the pressure causes the doubler to adhere securely and in a perfectly smooth condition to the quarter. While pressure is not applied by the iron **34** directly to that portion of the doubler which immediately overlies the back seam, the heat of the iron will effect adherence of the doubler to the quarter even in that narrow portion between the parallel lines of stitching **30**. It is these lines of stitching, however, which are relied upon to hold the doubler securely united with the quarter in the immediate vicinity of the back seam during the subsequent operation of turning the assembled upper members from their initial wrong-side-out

condition to their final right-side-out condition. Moreover, inasmuch as the doubler is smoothly and securely attached to the quarter and shaped to the curve of the back seam by the parallel rows of stitching **30**, the back seamed edge portions of the quarter will be smoothly covered and reinforced in such a way that no undesirable ridge will be formed thereby in the inside of the shoe, such as might cause discomfort to the wearer of the shoe. Usually such discomfort to the wearer is insured against by the application of a strip of tape to the inner side of the back seam of the quarter. It will be apparent that the stitching of the doubler to the quarter in the manner herein described renders unnecessary the usual operation of taping the back seam.

It should be understood that before the quarter is ready for assembly with an insole on a last a lining (that is, the lining proper, as distinguished from the doubler, the same being usually composed of upper leather) is assembled with and secured to the quarter, the lining proper overlying the doubler so that the doubler is interposed between the quarter and the lining and is entirely covered by the latter. Before assembly of the upper materials with the rest of the shoe the inner lining member or lining proper is usually secured by stitching to the upper edge portion only of the quarter and preferably, although not necessarily, this inner lining member is so attached before the quarter is turned right side out. The present invention, however, is not particularly concerned with the lining proper since it may have the usual form and arrangement and may be secured to the quarter in any customary manner. Accordingly, the lining proper has been entirely omitted in the drawings. For the purpose of appreciating the present invention, therefore, it will be sufficient to understand that after the doubler has been secured to the quarter, as already described, and either before or after the lining proper has been attached, as the case may be, the quarter is turned right side out. The relative arrangement of the quarter and the doubler will then be as shown in Fig. 6.

It will be noted that in turning the quarter from a wrong-side-out to a right-side-out condition those portions of the quarter and the doubler which are directly united by the parallel lines of stitching **30** and which, when the doubler is wrong side out, are outwardly convex lengthwise of the back seam at the wrong side of the assembly, are caused to assume a position in which they are inwardly concave at the wrong side of the assembly, whereas those portions which before turning were inwardly concave at the right side of the assembly become outwardly convex at that side at the completion of the turning operation. Because of the fact, however, that these portions of the quarter and the doubler have been firmly secured together by means of the parallel rows of stitching **30**, in addition to being secured together by means of adhesive, the strenuous action of turning the parts right side out will not result in the forming of any wrinkles or irregularities either in the quarter or in the doubler in the vicinity of the back seam **20**. On the contrary, the portions of the quarter and doubler in this locality will be retained by means of the rows of stitching **30**, each in a perfectly smooth condition, and the back seamed portions of the quarter will have the same amount of curvature lengthwise of the seam after turning as they had before being turned. Moreover, it will be appreciated that the herein-described method of assembly and uniting the quarter and the doubler is simple and effective and may be carried out expeditiously and without the use of any expensive or special equipment.

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

1. That improvement in methods of making shoe upper quarters of that type wherein the quarter comprises two members the rear edge portions of which are convexly curved and united by a back seam so that the seamed portion of the quarter is shaped to fit the heightwise curve at the back of a last, which consists in stitching a one-piece quarter lining to said quarter along parallel lines located at opposite sides of and in close proximity to said back seam thereby conforming the portion of the lining in the vicinity of said stitching to the last fitting shape of the corresponding portion of the quarter.

2. A shoe upper assembly comprising a two-piece quarter the pieces of which have convexly curved rear edge portions united by a back seam so that the portion of the quarter in the vicinity of the back seam is shaped to fit the heightwise curve at the back of a last, and a one-piece quarter lining having a portion secured to said portion of the quarter and conformed to the last fitting shape thereof by means of parallel lines of stitching located at opposite sides of and in close proximity to said back seam.

3. That improvement in methods of making shoe upper quarters which consists in securing together two pieces of upper material by means of a back seam to form a two-part quarter, providing a one-piece lining carrying a thermoplastic adhesive upon one side thereof, assembling said lining and said quarter with the adhesive-carrying side of the lining innermost, stitching said lining to said quarter along lines located close to and at opposite sides of the back seam, folding the quarter and lining assembly about the back seam to position the assembly inside out with the outside surfaces of the two parts of the quarter in engagement with each other and with the lining outermost, laying the quarter assembly upon a flat surface and pressing it with a hot iron thereby securing the lining to the quarter by means of said adhesive, and finally turning the quarter assembly right side out.

4. That improvement in methods of making lined quarter portions for shoe uppers which consists in securing together two pieces of upper material by means of a back seam to form a quarter, forming a one-piece lining member from napped fabric having its napped surface coated with thermoplastic material, assembling said lining member and the quarter with the coated surface of the lining member in engagement with the inside surface of the quarter, stitching said lining member to the quarter at opposite sides of the back seam, applying heat and pressure to the quarter and the lining member to cause the thermoplastic material to secure the lining member to the quarter, and thereafter turning the lined quarter.

5. A shoe upper quarter comprising two pieces of upper material secured together by a back seam, and a fabric doubler secured to the quarter by two lines of stitching arranged at opposite sides of and closely adjacent to the back seam and having its outer surface secured to the inner surface of the quarter forwardly of said lines of stitching by means of adhesive.

6. A shoe upper quarter having a doubler stitched thereto by means of spaced seams extending heightwise of the quarter at the back of the latter and by means of adhesive throughout the area of the doubler forwardly of said seams.

7. A shoe upper quarter comprising two pieces of upper material secured together by a back seam, and a one-piece doubler secured to the quarter by two lines of stitching arranged at opposite sides of and closely adjacent to said back seam and extending from the top to the bottom of the quarter, and by means of adhesive throughout the area of the doubler forwardly of said lines of stitching, the lower marginal portion or lasting allowance of the doubler having a notch therein shaped and arranged to expose said back seam, the notch being wider than the distance between said lines of stitching so that the stitching does not engage the lasting allowance of the doubler.

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