June 7, 1927.

1,631,919

C. O. CRISTALLINI

SHOE AND METHOD OF MANUFACTURE

Filed May 14, 1925

2 Sheets-Sheet 1

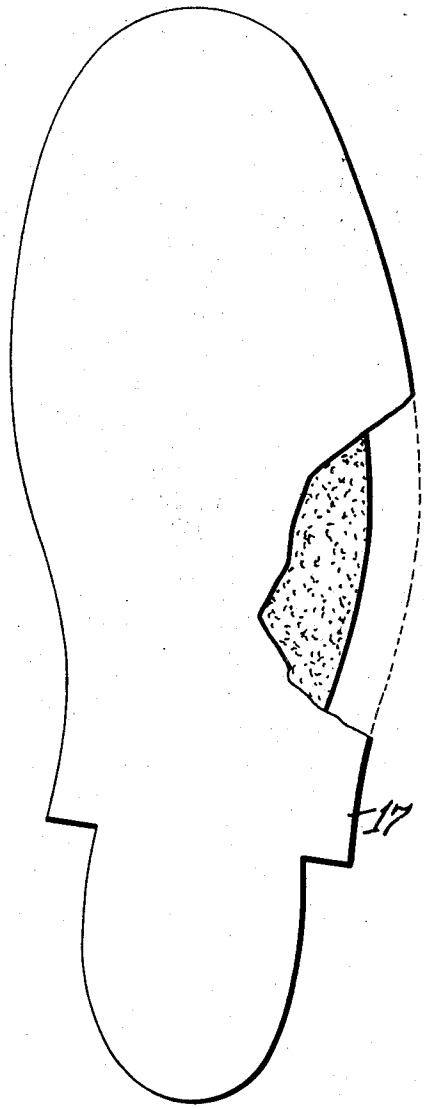


Fig. 1.

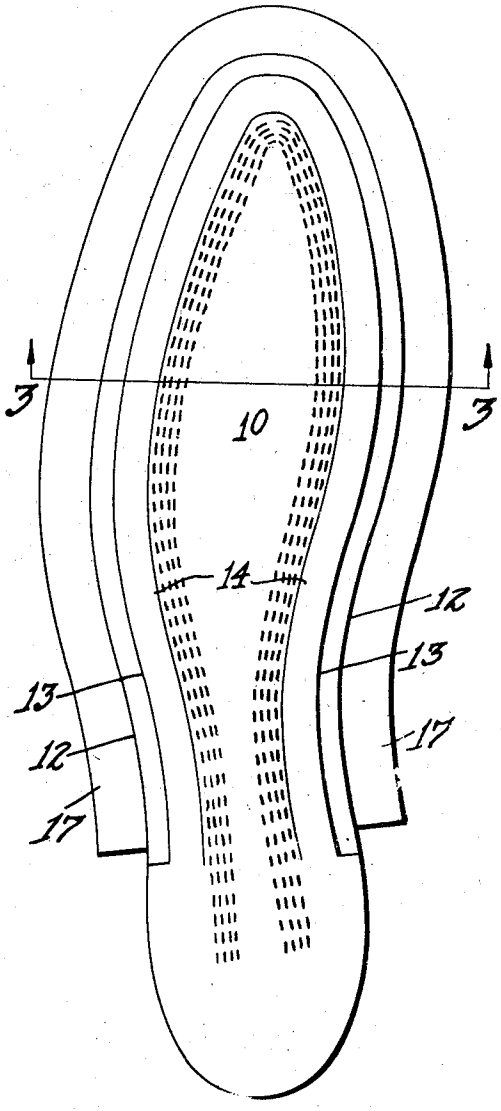


Fig. 2

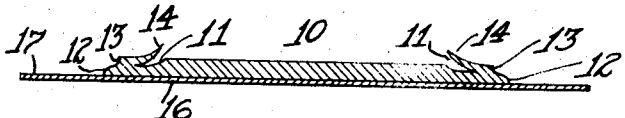


Fig. 3.

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Fig. 4.

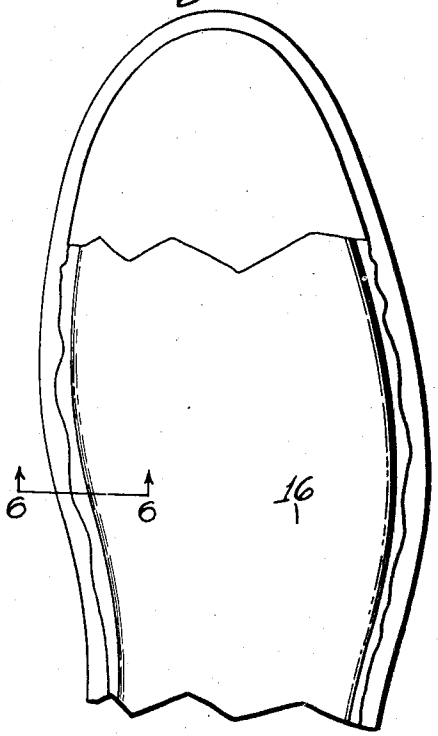
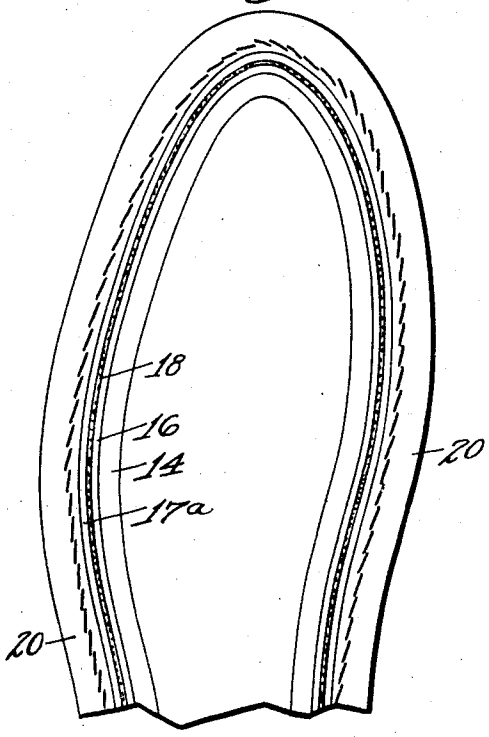


Fig. 5.



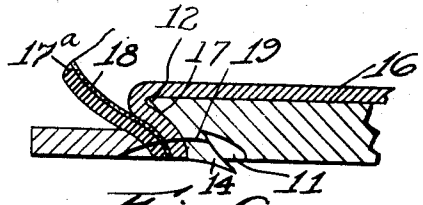


Fig. 6.

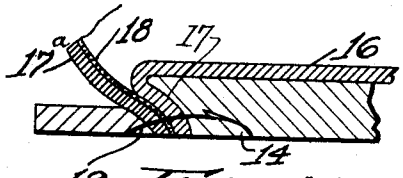


Fig. 7.

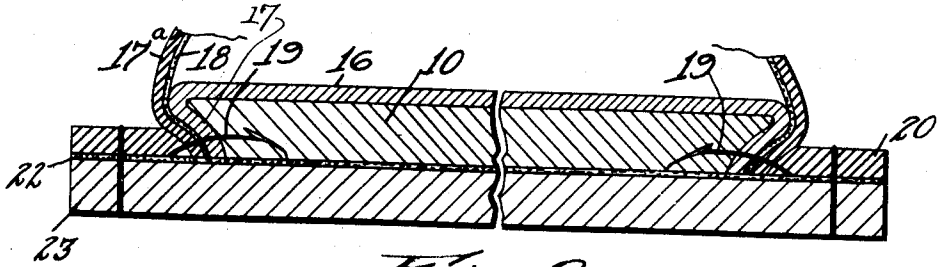


Fig. 8.

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Patented June 7, 1927. 1,631,919

UNITED STATES PATENT OFFICE.

CHARLES O. CRISTALLINI, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO PECK SHOE COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SHOE AND METHOD OF MANUFACTURE.

Application filed May 14, 1925. Serial No. 30,291.

This invention relates to the manufacture of shoes. The principal object thereof is to provide a shoe with a sole which is not put under a strain in the process of manufacture that will tend to concave the sole even before it is worn, but on the contrary will tend to flex it slightly in the opposite direction. This tends to counteract the pressure of the foot in wearing it and thus resist the tendency of the mere pressure of the foot to concave the sole, leaving it substantially flat, and lessen any discomfort and even serious foot troubles to the wearer. Another object is to avoid the use of the usual composition filling which ordinarily after considerable wear and heating spreads out and disappears from the points of greatest pressure so as to allow the sole to fall at the very points at which it should be held most firmly in its original position. This object co-operates with the first-named object to provide a sole that is flat all the way across not only when the shoe is first sold but after a long period of wear. Another object of the invention is to provide the in-sole in such form and made in such a way that the bottom of the in-sole will be left comparatively flat after the shoe is finished so that without any such soft filling as above mentioned it will support itself on the out-sole in a flat condition. These features co-operate to reduce arch trouble.

The invention also involves the covering of the in-sole with a smooth delicate surface which will not irritate the foot and will cover slight projections due to sewing or nailing, thus in another way adding to the comfort with which the shoe is worn. The lower side of the in-sole is also channeled in a new way so as to assist in its object by providing a flat surface after the upper is sewed to it around the edge. No material projection around the edge of the bottom of the in-sole will be left by this sewing to provide a space to be filled. The invention also involves the sewing of the covering of the in-sole in with the upper at the edges and the prevention of the squeaking by a layer of canvas or other permanent material under the in-sole.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a plan of an in-sole as it is provided in the shop ready for attachment of the upper in accordance with this invention partly broken away to show the interior;

Fig. 2 is a bottom plan view of the same;

Fig. 3 is a transverse sectional view thereof;

Fig. 4 is a plan of the shoe with the sides broken away to show the condition of the top of the in-sole especially;

Fig. 5 is a bottom plan thereof before the out-sole is put on;

Figs. 6 and 7 are transverse sectional views through the same showing two stages in the process of manufacture; and

Fig. 8 is a similar view of the completed shoe.

In the ordinary manufacture of shoes as now produced, the in-sole is provided with two channels on the bottom which is the flesh side of the sole leather. This is done to provide the grain side on top where a smooth surface is desired. There has been heretofore no object in leaving the grain side at the bottom because the ordinary double channel system provides a high ridge around the bottom of the in-sole after the upper is secured to it and leaves a space between the side ridges which has to be filled by a composition filler merely to bring the bottom of the in-sole to a flat condition. This composition filler also serves to prevent the squeaking which would be caused by the lower layer of the in-sole against the out-sole if nothing were provided between them. This layer of soft composition fills this space evenly when the shoe is put on the market. But after a little use it tends to disappear where the foot presses hardest on the bottom of the shoe, because due to the heat and pressure the soft material gradually spreads away into the parts under which there is no great pressure. Finally it is all gone at the points where the support is really needed.

Another disadvantage of the present method of manufacturing shoes is that with the old system the sewing of the upper into the channel in the bottom of the in-sole necessarily causes the bending upwardly of

the edge of the in-sole toward the upper. This concaves the in-sole and even when it leaves the factory the in-sole is not flat. This results in the provision of a concave surface across the shoe even when first put on, which tends to allow the transverse arch of the foot to drop at the center, it being supported at these points at the two ends of this arch. This causes some of the arch trouble which is now so prevalent and where it already exists it adds to it and is one of the reasons for the prevalence of this trouble. As stated above, this invention is designed to avoid all the above mentioned difficulty.

For these purposes I first reverse the in-sole 10 and put the flesh side at the top, leaving the smooth grain side at the bottom. This in itself is responsible for some of the advantages of this invention as will appear. Both sides are then smoothed down to any desired degree of smoothness by passing the in-sole 10 through a pair of rollers. This it will be seen will leave the grain side which is to be on the bottom in a smooth flat condition. I also introduce an important improvement in the way of channeling the bottom of the in-sole. The inner channel 11 is formed in the same way as has been the case heretofore and by the same methods, leaving an inwardly extending flap 14. Instead of the usual outer channel which provides an upwardly extending flap like that of the inner channel, I cut off the outer flap altogether, leaving a horizontal ledge 12 all the way around the in-sole except at the heel. This projection is of uniform thickness and is as thin as may be convenient in practice. This cut is deeper than has been made heretofore by the outer channel. This ledge 12 is bounded on the inner edge by a vertical wall 13. I may remark here while speaking of this part of the invention, that after the upper is sewed into the channel 11, the flap 14 of this channel is smoothed down back into its space very closely. This can be done on account of the reversal of the in-sole above described and on account of the fact that the usual outer flap is entirely dispensed with.

To complete the in-sole, I paste to its upper flesh surface a lining of calf-skin 16 covering the heel as well as the rest of the in-sole and having a surrounding flange 17 projecting out over the top of the in-sole except at the heel. This extends considerably beyond the ledge 12.

The in-sole is thus completed in the form shown in Figs. 1, 2 and 3 and now it is assembled with the rest of the shoe by bringing the upper 17^a and any lining 18 which it may have down with its edge in registration with the edge of the calf skin flange 17 and bringing these several layers over the edge of the in-sole 10 and sewing them to the outer surface of the flap. The tension exerted by the line of sewing tends to slightly convex the sole upwardly instead of concaving it as is the usual practice. In other words although the sole is really practically flat, there is a strain tending to move the center a little above the edges. The welt 20 is applied to the outside of these parts at the same time the same has been the case in ordinary practice by stitches 19. (See Fig. 6.) Now as stated above, I press this flap back against the surface of the in-sole and smooth it down so that these parts are all in one plane across the shoe as in Fig. 7.

It will be seen that in sewing the upper and the calf lining to the flap, I do not bend the sole in the process of manufacture so as to concave it on top, but whatever bending there is has the effect of convexing it on the upper side. The result is a sole practically flat across it as it leaves the shop. It is to be noticed that the welt 20 is not secured in position in exactly the old way because it is not secured to an upstanding flap on the outer channel, but on the contrary, is secured to the flap 14 of the inner channel directly. The reversal of the in-sole contributes to these advantages.

This leaves a construction in which the bottom of the in-sole is substantially flat all the way across and there is no projecting ridge around it which has to extend beyond it, therefore no space which has to be filled with a soft composition. However, for the purpose of preventing squeaking between this leather surface and the out-sole I place a layer 22 of canvas or other suitable material under this surface and the out-sole 23 is put on with it in the usual way. It will be seen therefore that not only do I avoid the layer of composition material, but in placing a layer to prevent squeaking I use a permanent one which cannot get out of position or bunch up in certain places and become thin in others as the shoe is worn.

I have provided a shoe which has no manufacturing strains at the edges tending to swing these edges up and make a concave in-sole. Furthermore, I have provided a construction which will effectively prevent the formation of dents and depressions in the sole of the shoe which will wear until the out-sole is so entirely weakened as not to be of further use. Also owing to the fact that these dents and depressions are not formed as the shoe is worn, and owing to the use of the calf skin 16, the cracking of the lining of the in-sole which is so common in the shoes on the market is necessarily avoided. This furnishes a shoe which will not cause or accentuate weakness of the transverse arch of the foot. It produces a shoe which will last considerably longer than the shoes in common use formed of equiva-

lent materials and yet the cost of manufacture is not increased. Such a shoe can be made of the materials specified or other materials ordinarily employed and for any purpose for which shoes are ordinarily manufactured.

I am aware of the fact that modifications can be made in the construction and method of manufacture by any person skilled in the art and that the principle can be applied to shoes of many kinds and types without departing from the scope of the invention as expressed in the claims.

Therefore I do not wish to be limited in these respects, but what I do claim is:—

1. As an article of manufacture, a shoe having an in-sole with a smooth flat lower surface provided with an inner channel, and having a lining on the top of the in-sole provided with a flange around the edge of the insole, a welt, a layer of textile material secured to the bottom of the in-sole and of the welt throughout their areas to prevent squeaking, and an outer sole secured thereto, the welt and in-sole being sewed together in a way to tend to convex the in-sole on top.

2. The method of making a shoe which consists in channeling the smooth grain bottom side of the in-sole, cementing a soft calf skin to the flesh side of the in-sole, securing the upper and calf skin to the up-turned channel flap, smoothing the in-sole on the bottom to a flat surface, cementing a layer of textile material thereto, and securing the out-sole in position on the grain side of the in-sole below the layer of textile material.

In testimony whereof I have hereunto affixed my signature.

CHARLES O. CRISTALLINI