UNITED STATES PATENT OFFICE.

STEPHEN A. DOBYNE AND GEORGE A. DOBYNE, OF ST. LOUIS, MISSOURI, ASSIGNS TO CHAMPION SHOE MACHINERY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

METHOD OF MAKING SEAMS FOR SHOE-SOLES.


Filed September 1, 1911. Serial No. 647,964.

To all whom it may concern:

Be it known that we, STEPHEN A. DOBYNE and GEORGE A. DOBYNE, citizens of the United States, and residing at St. Louis, in the State of Missouri, have invented new and useful Improvements in Methods of Making Seams for Shoe-Soles, of which the following is a specification.

This invention relates to a method of making seams for securing soles to shoes, and more particularly to a method of making metallic fastener seams for shoe soles.

In the manufacture of shoes, the sole is ordinarily attached by a stitched seam with a sewing machine. In a McKay shoe, the stitches pass through the outside, upper and insole, and sometimes through a tap or slip sole which is placed between the outside and upper. Various methods have been proposed for making a metallic seam in a McKay shoe, but without success, since the seams heretofore used rendered the sole and the entire shoe stiff and not flexible like a sewed shoe. Therefore although a metallic seam has superior wearing qualities, and requires for its production less complicated machinery and less skilled operators than a sewed seam, it has not been possible heretofore to make an efficient metallic seam which will leave the sole flexible and at the same time possess good wearing qualities.

The object of this invention therefore is to provide a method of making a metallic seam, which seam will possess all the desirable characteristics and qualities of both a sewed seam and a metallic seam, and which method can be performed with simple mechanism and by unskilled operators.

The invention will be fully described in connection with the accompanying drawings in which:

Figure 1 is a side elevation of a McKay shoe, parts being broken away to show the novel seam in section. Fig. 2 is a cross section of the shoe shown in Fig. 1, the section being taken at the fore part. Fig. 3 is a section along the seam, Fig. 4 is a detail of one of the fasteners and an enlarged view of its point, Fig. 5 is a view of the fastener in string form, Fig. 6 is a section of the seam at the Shank of the shoe, Figs. 7 and 8 are views showing the method of making the seam and Fig. 9 is an enlarged section along the seam showing the clenched point of the nail.

The shoe is of the McKay type and is generally designated by S, while 10 designates the upper, 11 the insole, 12 the tap or slip sole and 13 the outside. The outside is secured to the shoe by means of the novel seam forming the subject matter of our application. Serial No. 647,963, filed of even date herewith, while the method of making this seam forms the subject matter of this application. The fasteners forming the 65 seam pass through the outside, tap sole, upper and insole.

The fastener 14 is preferably of the string nail type, a string designated by the reference character T being shown in Fig. 5, and the fastener detached from the string being shown in Fig. 4. The fastener is provided with a laterally extending well defined and non-clenching head 15 as distinguished from an intumescence hook-shaped or clenched head, the head tapering inwardly to the Shank of the fastener as shown at 16. The string T is made by cutting pieces out of one edge of a strip as described in an application of Stephen A. Dobyne, Serial No. 583,329, filed Nov. 21, 1910. This will leave the cut edge a of the fastener weaker than the unmelt edge b, which edge b has been rolled and strengthened in the operation of rolling the strip or wire in its process of manufacture. The fastener in its detached condition as shown in Fig. 4 has its point 17 abruptly turned or deflected in the direction of the head 15. The method of forming this point will now be described, and for this purpose a simple form of mechanism will be described by means of which the method may be performed, although other mechanism or even simple tools may be used.

Referring to Figs. 7 and 8 which show 95 mechanism for cutting off the fastener forming the point, and driving the same, 52 designates a throat which is pivoted at 53 on a suitable frame 29 and is arranged to be moved into and out of alignment with the 100 driver 98. A guide 65 for the string T is also pivoted at 53 and is normally held in engagement with a stop 70 by a spring 71, and a feeding and cutting member 78 cooperates with this guide. The upper face 105 of the throat is provided with a hardened
cutting die 95 which is slightly undercut or beveled as shown at 96. An awl 101 mounted upon its awl carrier 100 is arranged to be moved into and out of engagement with the work and into and out of alignment with the driver so as to feed the work and place the puncture or awl hole in the line of drive. The mechanism is shown and described in our application, Serial No. 724,680, filed October 8, 1912, to which application reference is had for the details of construction.

In the operation of the mechanism the throat is moved from the position shown in Fig. 7 to the position shown in Fig. 8, and the feeding and cutting member is then moved from the position shown in Fig. 7 to the position shown in Fig. 8 so as to feed the string T into the driver passage. Thereafter the feeding and cutting member is moved to the right Fig. 8, the guide being supported against the action of the feeding and cutting member by the spring 71, and the three members 65, 78 and 95 cooperating to cut off the lowest fastener. The angular relation of the guide 65 and the throat 52 will cause a bend to be formed in the string T at a point where the lowest fastener joins the one above it. The feeding and cutting member 78 and the die 95 operate to cut the string above the head of the lowest fastener and just below the bend formed in the string. The parts are so constructed and arranged that the joint of the fastener will be slightly turned or deflected laterally as fully described in our application referred to above. While the throat has been moved to the left, the awl has formed a hole and placed this hole in the line of drive as shown in Fig. 8. Thereafter the awl is retracted and the throat with its fastener is moved to the left to place the driver passage in the line of drive and in alignment with the puncture, and the driver thereafter descends to drive the fastener into the stock as shown in Fig. 7, the fastener being clenched on the anvil 125. It will be understood that the specific mechanism is not absolutely essential for performing these operations, but other mechanism whether automatic or manually operated may be used for this purpose, and the operations may even be performed by simple tools.

The point 17 is slightly turned or deflected in the direction of the head 15 before it is driven to form an abrupt bend, therefore when this point strikes the anvil it will be turned or clenched in a predetermined direction of the deflected point and, namely in the direction of the laterally extending head 15. This preliminary preparation of the point will therefore insure that the fastener will be clenched in a predetermined direction. Another factor which will insure such a predetermined clenched edge is due to the fact that the cut edge a is weaker than the uncut or mechanically treated edge b. This will insure the clenching of the point in the direction of its weakest edge a, making the uncut edge b the outer or convex edge of the clenched point.

In the operation of making the seam the fasteners are inserted so that the heads will lie at the outer face of the outsole, and so that these heads will extend in the direction of the seam as shown in Fig. 3. Where the fasteners are nailed - "aloft" these heads will lie substantially flush with the outer face of the outsole, or slightly countersunk. Where a channel is formed in the outsole, the fasteners are inserted in the channel and are then covered by turning down the channel flap. The points 17 are clenched and turned back into the insole, and the point and the fastener itself are so formed, as described above, that the points as clenched and turned back will extend in the same direction and in a direction along the seam. In the completed seam therefore the heads as well as the points will extend in the same direction and in a direction along the seam. At the Shank of the shoe where the sole is thinner than at the fore part, the points will be clenched more as shown in Fig. 6, and it is therefore not necessary to use two sizes of fasteners for the fore part and shank respectively.

In referring to Fig. 9 it will be noted that in the formation of the clenched deflected point will be turned toward the Shank of the fastener. Moreover when the deflected point of the nail strikes the anvil it will itself be bent laterally so that when it turns back into the insole it will curl toward the Shank. This will give the clenched point the effect of fish hook anchorage, the laterally deflected point acting as a barb to prevent the clenched point from working upward or downward above the upper face of the insole. The nail is thus supported in the sole against movement either upwardly or downwardly. The nail will therefore wear uniformly with the sole and will not project beyond the face of the outsole even if the nail head is worn off. The beveled nail head does however assist materially to maintain the firm grip of the seam.

The turning or deflecting of the point is sufficient to predetermine the direction of clenched, but is not sufficient to cause the fastener to curl or bend in the leather before it is driven and before it strikes the clenching anvils. This curling in hard stock is avoided by forming an awl hole or puncture which will guide and support the fastener while it is being driven. Care must however be taken to properly locate the awl hole with respect to the fastener in the throat. If the fastener has a tendency to curl, then the awl hole should be placed slightly to the right Fig. 8, with respect to the line of
drive so as to overcome this tendency. The seam produced by this method will be exceedingly flexible as fully set forth in the application for the seam, Serial No. 647,263.

It will thus be seen that the invention accomplishes its objects. A seam is produced which will be practically as flexible as a sewed seam, but will possess better wearing qualities, and this seam can be made in simple machines compared with the McKay sewing machine, and can be made by unskilled operators. The clenched points are turned back into the insole so that the inside face of the insole will be left perfectly smooth, since the projecting point itself is buried in the leather, leaving only a rounded part exposed on the face of the insole. The fish hook anchorage will moreover prevent the clenched points from working up above the face of the insole. The sock sole usually required in McKay shoes may therefore be dispensed with. The fasteners may be countersunk in the outsole, and the holes can be closed in the leveling and scouring operations, so that the outsole will be left smooth. The channel and its accompanying channeling operation can therefore be omitted, thus resulting in a saving of cost of manufacture.

Having thus described the invention what is claimed is:

1. The method of attaching soles to shoes by a metallic fastener seam which comprises presenting a plurality of fasteners having abruptly deflected points to the outsole with the deflected points extending in the same direction and in the direction of the seam, inserting the fasteners so presented through the outsole and insole, and clenching the points of said fasteners back into the insole in the direction of the deflected points, whereby said outsole and insole are secured by a row of fasteners having their points clenched and extending in the same direction and in the direction of the seam.

2. The method of attaching soles to shoes by a seam consisting of metallic fasteners which comprises abruptly deflecting the points of the fasteners an amount sufficient to predetermine the direction of the clenched, a clenching anvil but not sufficient to cause the nail to curl while passing through the material, inserting the fasteners through the outsole and insole, and clenching the deflected points by engagement with a clenching anvil back into the insole and in the direction of their abrupt deflection, for the purpose set forth.

3. The method of attaching soles to shoes by a metallic fastener seam which comprises abruptly deflecting the point of the succeeding fastener, severing said succeeding fastener from its successor and simultaneously deflecting the point of said successor, presenting said severed fastener to the outsole with its deflected point extending in the direction of the seam, inserting the fastener so presented through the outsole and insole, and clenching and turning the point back into the insole in the direction of its deflection, whereby said clenched point extends in the direction of the seam.

In testimony whereof we affix our signatures in presence of two witnesses.

STEPHEN A. DOBYNE.
GEORGE A. DOBYNE.

Witnesses:
J. V. MANNING,
J. H. BRUNINGA.