Feb. 5, 1935. S. M. NICKERSON 1,990,247

SHANK STIFFENER WITH ATTACHING MEANS

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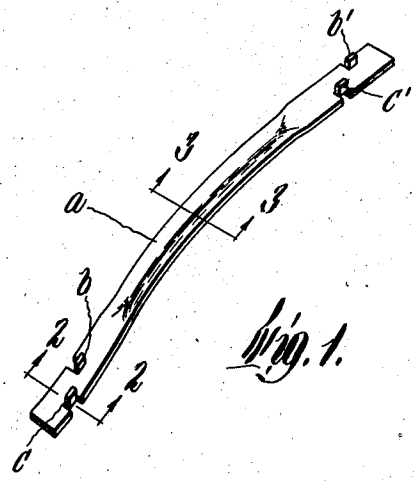


Fig. 1.


Fig. 2.


Fig. 3.

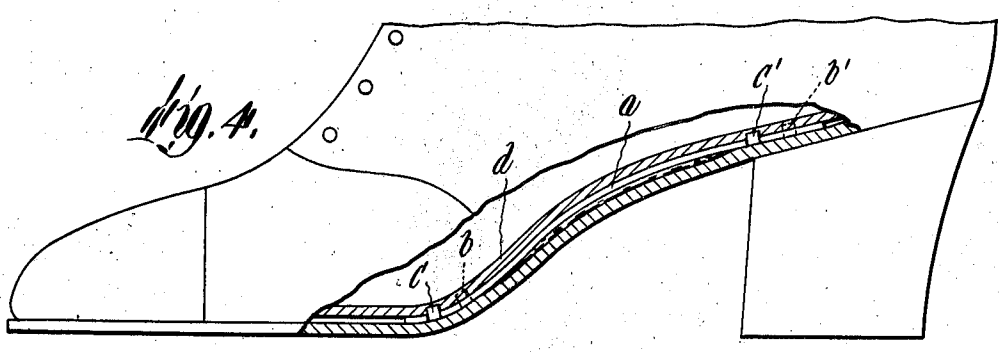


Fig. 4.

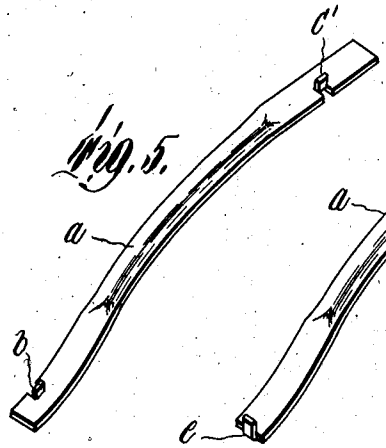


Fig. 5.




Fig. 6.

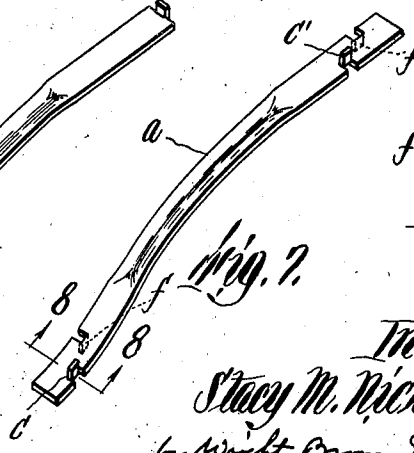


Fig. 7.


Fig. 8.

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# UNITED STATES PATENT OFFICE

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## SHANK STIFFENER WITH ATTACHING MEANS

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Application March 7, 1934, Serial No. 714,470

8 Claims. (Cl. 36—76)

The present invention relates to the metal shank stiffeners which are used in shoes for the purpose of maintaining the shape of the shank part of the shoe. It is particularly concerned with means for anchoring or attaching the stiffener to the innersole, for the purpose of holding it permanently in place, not only during the manufacture of the shoe, but afterwards when the shoe is on the wearer's foot and subjected to flexure of various directions by the weight and movements of the wearer.

Heretofore it has been the practice to secure such shank stiffeners by means either of separate tacks or of integral prongs cut from the substance of the stiffener itself, driven through the innersole and clinched at the inner side of the latter. Such tacks and prongs have always heretofore been made with sharp points and clinching of their pointed ends has been essential to prevent their withdrawal. But to clinch them requires that they be made longer than the thickness of the normal innersole, and that the last on which the shoe is made be non-penetrable by the points of the prongs. Practically this has limited the use of permanent attaching means for shank stiffeners to shoes made on lasts which either have a continuous iron or steel plate on the bottom, or such a plate on the heel part. Where the heel part only of the last is thus armored, the shank stiffener can be secured by clinched points only at the heel end thereof, which leaves the forward end free to rub and make squeaking noises when the shoe is worn, and to shift sidewise out of place.

The cost of equipping lasts with complete bottom plates of iron or steel is so great as to be practically prohibitive, particularly when styles are changed so frequently that the factories have to be equipped with new lasts at frequent intervals. Some shoe manufacturers have sought to lessen this expense by providing a bottom plate only at the heel part and setting an iron insert into the last bottom at the ball part thereof, which is the location of the forward end of the shank stiffener, so as to provide a clinching anvil for prongs or the like at such forward end. But this practice also is too expensive to be satisfactory. Consequently the more general usage at the present time is to stick the shank stiffeners to the innersole with cement only. This mode of attachment is effective only to retain the stiffener during the shoe making process, and is wholly ineffective to prevent it from shifting out of place throughout the wearing life of the shoe.

Another fatal objection to integral clincher prongs on shank stiffeners is the quality of the steel from which a large proportion of the shanks now in use are made. In order to provide adequate strength and resilience, these shank stiffeners are made of a hard steel composition; so hard that sharp prongs formed from their substance usually break when the attempt is made to clinch them. When broken, the remnants of such prongs, due to their inclined side edges, quickly work out of the innersole when the shoe is being worn, and allow the stiffener to shift out of place.

The invention herein consists in a shank stiffener having attaching means which are free from the objections above referred to, and are effective to secure the stiffener in place without penetrating through the entire thickness of an innersole and without being clinched.

The drawing furnished herewith depicts the invention in a variety of equivalent embodiments.

Fig. 1 shows a perspective view of my new shank stiffener equipped with integral anchor lugs at opposite sides adjacent to its two ends;

Figs. 2 and 3 are detail sectional views on lines 2—2 and 3—3 respectively of Fig. 1;

Fig. 4 is an elevation of a shoe, with the shank part represented in section and showing the shank stiffener of Fig. 1 incorporated therein;

Figs. 5, 6 and 7 are views similar to Fig. 1 showing specifically different variants of the same invention;

Fig. 8 is a cross section on line 8—8 of Fig. 7.

Like reference characters designate the same parts wherever they occur in all the figures.

*a* represents the shank stiffener body. This may be of any suitable form and dimensions, and is shown here as made from a strip of sheet steel approximately ¼" in width, strengthened by being offset along its median line except at the ends, and being longitudinally curved conformably to the shank part of the shoe for which it is designed. The invention comprehends nothing new in these particulars, but may be embodied in shank stiffeners of widely varying characteristics. The new step is embodied in the attaching means, which in Figs. 1 and 2 consist of anchor lugs *b*, *b'* adjacent to one side edge of the stiffener body, near the opposite ends thereof; and similar anchor lugs *c*, *c'* near the respectively opposite sides and ends of the body. These lugs are formed by incising the shank body inwardly from its edge, on lines perpendicular to the edge, and bending the substance of the shank body between such cuts, up at right

angles to the plane of the adjacent part of the body. By virtue of this construction, the lugs have parallel sides, their end bounding edges are perpendicular to these sides, and they have the same thickness as the stock of which the shank body is made. This thickness is such (approximately forty thousandths of an inch in the specific article chosen for illustration) that the lugs will enter the substance of any of the materials used for innersoles, whether made of leather, leather-board, fiber, or other suitable material. But they are made of a height less than the thickness of the normal innersole stock so that, when the stiffener is applied to an innersole *d* (Fig. 4) attached to the bottom of a last, the lugs will enter the substance of the innersole, but will not pass through it, substantially as illustrated in Fig. 4. Shank stiffeners equipped with these attaching means are laid against the outer face of the innersole attached to a last bottom, as usual, and the anchor lugs are driven into the innersole substance by hammer blows at each end of the stiffener.

An adequately strong bond is created between the embedded lug and the innersole material, notwithstanding that the lug is not clinched and does not pass all the way through the innersole. I attribute the strength of this bond to the fact that the sides of the lugs are straight and parallel and their embedded corners are square, whereby the innersole material tends to hug and grip the lug, rather than to crowd it outward. Another factor which I believe contributes to this effect is that the lugs have substantial width. In the example illustrated, their width is approximately one tenth of an inch; but it is to be understood that I do not limit my protection narrowly in this particular. In terms of proportional dimensions, the ratio of protruding height of the lugs here illustrated to their width is approximately as six or seven to ten; and of thickness to width, as four to ten. But whatever the correct explanation may be, the demonstrated fact is that such lugs anchor the shank stiffener firmly to the innersole and prevent it from coming loose.

The anchor lugs as shown in this drawing and heretofore described, have equal width at the extremity and base, (by "base" I mean the part of the lug which is connected with the body of the shank stiffener). This is due to the parallelism of the cuts which sever the sides of the lug from the body of the stiffener. Its corners are square, due to the fact that the cuts extend perpendicular to the edge of the body. However, it is within my contemplation to make the lugs slightly wider at the extremity than at the base, and make their corners slightly acute rather than square, in order to increase the strength of connection with the innersole by providing space into which the innersole substance may crowd behind the entering edge of the lug.

Lugs such as those described above may be varied in numbers and variously positioned; but preferably they are always near the opposite ends of the stiffener where they leave the middle part free to flex under the weight of the wearer. Fig. 5 shows one variation in which there are only two such lugs, corresponding respectively to the lugs *b* and *c'* of Fig. 1; i. e., at respectively opposite sides and opposite ends of the stiffener. Fig. 6 shows a variation in which there are two such lugs, *e* and *e'*, located respectively at the extreme ends of the stiffener body with their width dimensions extending crosswise of the body, instead of longitudinally as in the other forms illustrated.

Fig. 7 shows a further variation in which there are lugs corresponding to *c* and *c'* of Fig. 1 for embedding into the innersole, and other lugs *f* and *f'*, of similar formation but oppositely turned, to be embedded in the outer sole as an additional anchorage against shifting of the stiffener in the completed shoe while being worn. It will be understood that outturned lugs corresponding to *f* and *f'* may be located at any desired points along the sides or ends of the stiffener body, and provided in any desired numbers, in connection with upturned lugs arranged as shown in Figs. 5 and 6, or otherwise.

Such lugs may be formed in shank stiffeners of hard steel compositions, being severed and bent up before the stiffener bodies are hardened and tempered. That is, they are serviceable with stiffeners of those compositions which, in clincher forms, would cause breakage of the prongs when clinched. They are equally serviceable in connection with all types of lasts, whether the latter are entirely of wood, or have iron bottoms; and as they cannot penetrate to the inside of the shoe, they cause neither discomfort to the wearer nor destruction of the wearer's stocking.

What I claim and desire to secure by Letters Patent is:

1. A shank stiffener of metal having an integral upturned anchor lug of a length less than sufficient to penetrate through a normal innersole, and of a width at its extremity substantially as great as its base width.

2. A shank stiffener of metal having an integral upturned anchor lug of a length less than sufficient to penetrate through a normal innersole, and of a width at its extremity substantially as great as its base width, the end bounding edge of said lug being substantially straight and making substantially equal angles with both side bounding edges.

3. A shank stiffener of metal having an integral upturned anchor lug of a length less than sufficient to penetrate through a normal innersole, and of a width at its extremity substantially as great as its base width, the outer corners of such lug being substantially square.

4. A shank stiffener of stiff sheet metal having an integral lug formed as a partially severed tongue projecting substantially at right angles to the portion of the stiffener body contiguous to its base and having substantially parallel side edges substantially perpendicular to said contiguous part of the body.

5. A shank stiffener of tempered steel having an integral upturned anchor lug of which both outer corners are no greater than a right angle and the height is less than the thickness of a normal innersole, while the thickness is small enough to permit penetration into the substance of an innersole.

6. A shank stiffener consisting of a body formed from sheet steel, hardened and tempered, and having upstanding anchor lugs at opposite ends formed of integrally connected tongues partially severed from the stock of the shank stiffener material on lines which provide the lugs with substantially parallel sides and a substantially square end edge at substantially right angles with such sides; said lugs having substantial width and being sufficiently thin to penetrate innersole material; and the stiffener having similar lugs projecting oppositely to the lugs first

described adapted to be embedded in the substance of the outer sole of the shoe when the lugs first described are embedded in the innersole of the same shoe.

7. A shank stiffener consisting of a sheet steel body having integral anchor lugs partially severed from its substance and turned respectively upward and downward, adapted to be embedded in the material of the innersole and outer sole respectively of a shoe; said lugs having substantial width, with substantially square corners, and being of less height than the thickness of the innersole and outer sole respectively in which they are designed to be embedded.

8. A shank stiffener consisting of a sheet steel body having integral anchor lugs partially severed from its substance and turned downward, adapted to be embedded in the material of the outer sole of a shoe; said lugs having substantial width, with substantially square corners, and being of less height than the thickness of the outer sole in which they are designed to be embedded.

STACY M. NICKERSON.