

June 8, 1937.

E. C. HEILHECKER

2,083,376

SHOE SOLE

Filed March 14, 1935

2 Sheets-Sheet 1

Fig. 1.

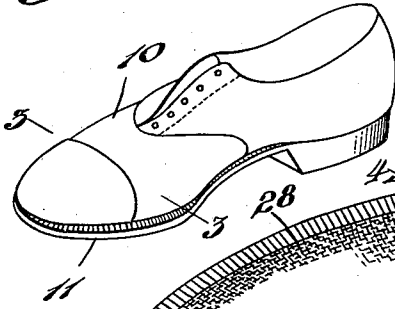


Fig. 2.

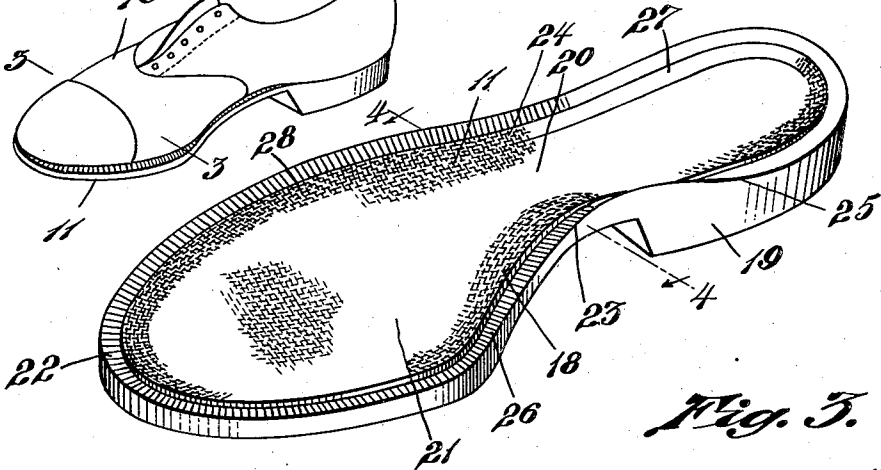


Fig. 3.

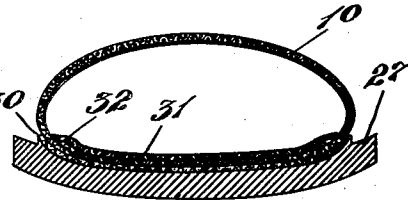


Fig. 5.

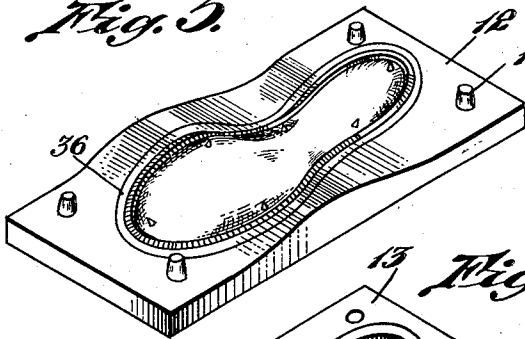


Fig. 6.

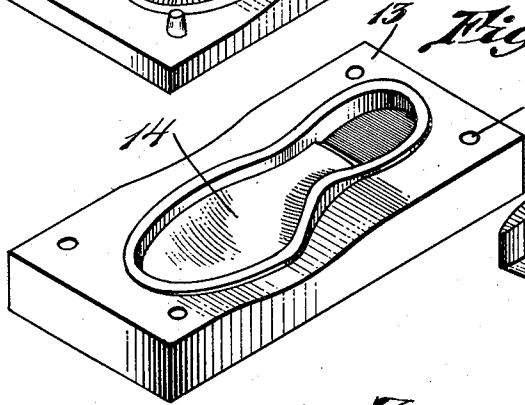


Fig. 4.

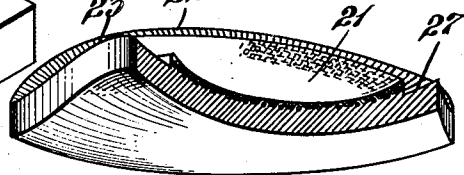
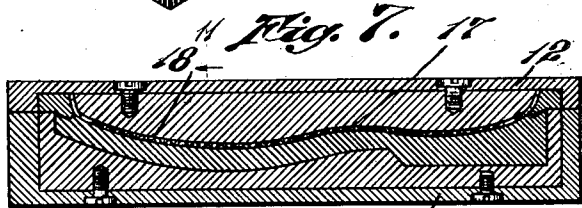


Fig. 7.



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Fig. 8.

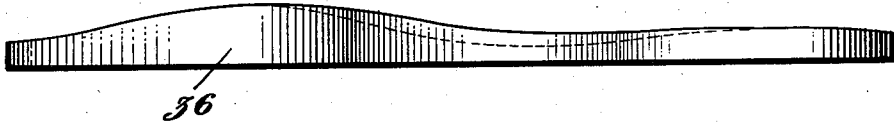


Fig. 9.

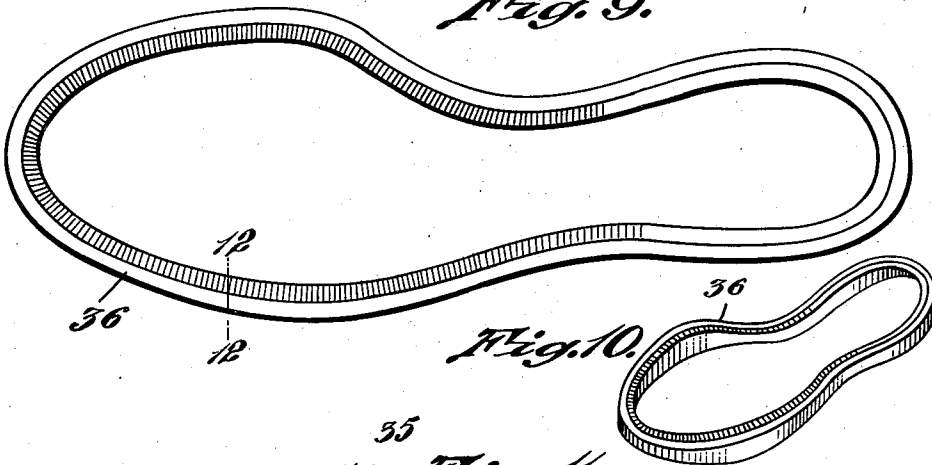


Fig. 10.

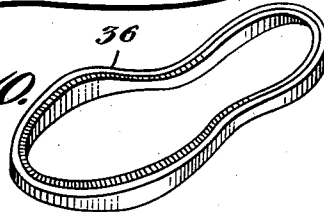


Fig. 11.

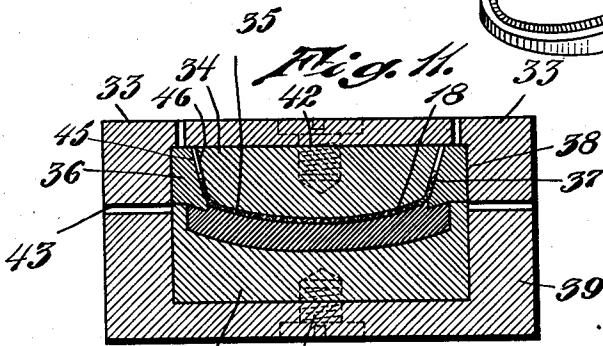


Fig. 12.

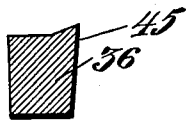
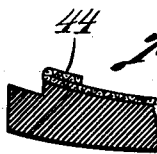


Fig. 13.



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UNITED STATES PATENT OFFICE

2,083,376

SHOE SOLE

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Maurice C. Smith, Jr., Bristol, R. I.

Application March 14, 1933, Serial No. 660,632

13 Claims. (Cl. 36—32)

This invention relates to a shoe and has for one of its objects the provision of a shoe sole of such form that it may be cemented to the upper of the shoe without pulling away from the upper of the shoe.

Another object of the invention is the provision of a shoe sole which will so fit the foot and shoe upper that no tendency exists to pull the sole away from its upper when in cemented position.

Another object of the invention is the provision of an elastically resilient vulcanized rubber sole which, when cemented to the upper, will have no inherent tendency due to movement of its parts tending to cause the sole to pull away from the upper that is cemented thereto.

Another object of the invention is the provision of a moulding device by which the shoe sole and a fabric upper surface may be secured thereto with the fabric surface in a desired centered position with reference to the shoe sole.

A further object of the invention is the provision of a device for securely holding a fabric to be attached to the upper surface of the outsole securely in position to be vulcanized to the outsole.

A still further object of the invention is the secure holding of the fabric in position in the mould with easy attachment and release of this fabric from such position.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a perspective view of a cemented sole shoe which sole is formed in accordance with this invention.

Fig. 2 is a perspective view of the sole before being attached to the upper.

Fig. 3 is a sectional view on line 3—3 of Fig. 1.

Fig. 4 is a sectional view on line 4—4 of Fig. 2.

Fig. 5 is a perspective view of one part of the mould for the sole.

Fig. 6 is a perspective view of another part of the mould.

Fig. 7 is a sectional view through the mould with a sole in position therein, a sole also being shown in section.

Fig. 8 is a side elevation of the clamping ring for securing the fabric in position.

Fig. 9 is a top plan view thereof.

Fig. 10 is a perspective view of this ring.

Fig. 11 is a sectional view through the mould substantially on line 11—11 of Fig. 7.

Fig. 12 is a section on line 12—12 of Fig. 9.

Fig. 13 is a fragmental sectional view of the sole with the fabric surface folded over after being removed from the mould, showing modified arrangement of the fabric in the further operations after coming from the mould.

In the formation of shoes in which the sole is sewed to the upper there is a sufficient bond of attachment due to the stitching to maintain the sole in a slightly curved position from which it may tend to straighten out due to its inherent resilience. In cementing the sole of a shoe, if the sole is caused to take such curvature, it continually tends to straighten out and pull away from the cement bond, and in order that this may be avoided in a vulcanized rubber sole having a material amount of resiliency or pulling away qualities I have moulded and vulcanized this rubber sole in a shape such that its upper surface substantially conforms to the shape and curvature of the bottom of the foot and also to the bottom of the lasted upper to which it is cemented, by which arrangement there is no flexing of the sole from its natural position of curvature, and thus no tendency for the sole to pull away from its upper when cemented. I have found in my moulding a shoe sole with a fabric upper surface that frequently the fabric is positioned at one side or the other of the desired central position and to prevent this I utilize a fabric of a size larger than that desired in the finished shoe, and use this excess of material as a means for holding the same in desired position by clamping it with a telescoping member in the desired position in the mould, which clamp may be easily released after vulcanization has taken place and the excess fabric removed or turned in to form a part of the shoe as desired, and the following is a detailed description of the present embodiment of this invention illustrating the preferred means and method by which the sole may be formed.

With reference to the drawings, 10 designates a shoe upper to which a sole designated generally 11 is attached by cementing, this sole 11 is shaped in a mould consisting of two parts 12 and 13 by positioning a certain desired quantity of rubber or rubber composition in the recess 14 in the part 13 of this mould and then positioning the part 12 with the pins 15 entering the recesses 16 of part 13 and forcing these parts together to squeeze the material 17 between these two parts 12 and 13 so that the material will be forced into all the depressions between the parts, and while being compressed in this manner a fabric strip 18, which is laid over the upper

surface of the material, will become impregnated on one side with the material which is in a plastic or semi-plastic state, if not previously impregnated by frictioning, on one side only, and when such mass is formed and the material squeezed into the shape desired I will then vulcanize the rubber or plastic composition that it may maintain this shape as its natural shape when coming from the mould.

10 The sole which I have thus formed is of one integral piece of material from which the fabric covering 18 cannot be readily detached. This fabric covering may be frictioned on one side only, which frictioned side is secured by vulcanization to the sole, thus leaving the other side of the fabric or fibrous covering layer free from rubber and providing a surface which is more adaptable to receive the cement. I may use pyroxylin cement for securing the fibrous surface of the sole to a like fibrous surface on the bottom of an insole in a manner as disclosed in my Patent No. 1,901,782, of which I am one of the joint inventors. In some cases either one or both of these fibrous surfaces may be buffed or roughed to better receive the cement where desired. There is a heel 19, a shank portion 20, a ball portion 21 about all of which there may or may not be provided a feathered edge 22 as desired with impressed indentations to indicate stitching. The fabric material 18 in instances where the feathered edge 22 is provided will not extend out to the feather edge as this is the portion which protrudes beyond the upper of the shoe and is not cemented to the upper.

35 The upper surface of the sole formed in this manner is of a varying curvature and may be best described by stating that it conforms substantially to the curvature of the bottom of the foot. The inner edge 23 of the shank portion 40 is higher than its corresponding opposite outer edge 24 which characteristic causes the sole to better support the arch of the foot and is new in soles of this character. From this high point 23 there is a gradual slope rearwardly as at 25 and a more abrupt sloping forwardly as at 26, while the opposite outer edge of the shank, which is slightly higher than any point along this corresponding edge, remains almost level with the edge 27 of the heel and gradually slopes downward as at 28 although not on as steep a slant as along the edge 26.

By this manner of formation a sole is provided of varying thicknesses throughout its extent. The heel will be relatively heavy and provide a cushion as is usual in rubber heels of this character. There will be an abrupt line of demarcation as of 30 adjacent the feather, and this point of demarcation provides a gradual slant inwardly therefrom over the surface of which the fabric is secured.

In order that the fabric 18 may be positioned at the desired point on the upper surface of the sole I provide a specially constructed mould. This mould will have a casing or frame portion 33 in the center of which there is secured by bolt 42 the shaping portion 34 for the upper surface having a surface 35 for engagement with the fabric. Over this surface 35 the fabric 18 is positioned which is held in place by a peripheral clamping member 36 telescoping over the same and fitting closely about the periphery of the central portion 34 and holding the edges 37 of the fabric between this clamping member and 75 the shaping portion 34. This clamping mem-

ber also closely fits within the casing 33 engaging the inner surface 38 thereof so as to firmly bind the fabric in position and prevent it from laterally or longitudinally shifting its position in the mould. The inner surface 45 of the clamp 5 is beveled to cooperate with the inner bevel surface 46 of the shaping portion so that as the clamp is moved toward setting position against the inner surface of the casing 33, the fabric will be tightly stretched across the surface of the portion 34 and prevent any folds or wrinkles occurring therein.

The lower portion of the mould consists of a casing or frame 39 having a shaping insert 40 secured therein by a bolt or screw 41 similar to the bolt or screw 42 in the other portion of the die, which insert 40 cooperates with the portions 34 and 36 of the upper half of the die that the material or sole may be formed in its desired shape. The two casing portions 33 and 39 are 20 forced together and any excess rubber which is placed within the mould will be squeezed therefrom outwardly through openings or recesses 43 between the casing portions until finally the cooperating moulding portions will contact and compress the full content of the mould into the desired position.

The sole, after acquiring the desired shape, is vulcanized and then taken from the mould, the clamp 36 will be taken apart and the shoe sole 30 will have an excess of fabric 37 about its edge adjacent the feather portion above mentioned. This excess portion may be removed by cutting the fabric off as illustrated in Figures 1 and 4 or it may be turned over as illustrated at 44 in Fig. 13, and the edges buffed. The sole so formed in either way is then cemented to the insole 31 of a shoe and the turned in edges 32 of the upper in any usual or convenient manner.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. An unattached solid sole, mold-generated both as to material and form, having its upper edge materially higher on its inner side at the shank portion than on its outer side, and a curvature of its bottom generally along its central longitudinal line such that its contours tend materially upward from the ball region of the sole, the sole having substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

2. A vulcanized solid unattached rubber sole having its upper edge materially higher on the inner side at the shank than at the outer side and having a curvature generally along its central longitudinal line such that its contours tend materially upward from the ball region of the sole, the sole having substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

3. An unattached solid sole, mold-generated both as to material and form, having one edge thereof higher than the corresponding opposite edge, the sole having a material curvature along the generally central longitudinal line thereof from the ball region forwardly thereof and being of a substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

4. An unattached sole, mold-generated as to material and form, having one edge of the shank thereof higher than the corresponding opposite edge of the shank, the sole having a material curvature along the generally central longitudinal line thereof from the ball region forwardly thereof and having substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

5. An unattached solid sole, mold-generated both as to material and form, of uneven thickness transversely thereof throughout its extent and having its upper edge substantially higher on the inside of the shank than on the outer side thereof and having a longitudinal curvature generally along its central longitudinal line such that its contours tend materially upwardly from the ball region of the sole, the sole being of substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

6. An unattached vulcanized rubber sole of uneven thickness transversely thereof throughout its extent and having its upper edge substantially higher at the inner side of the shank than at the outer side thereof, the sole having a substantial curvature along its generally central longitudinal line and having a substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof.

7. An unattached solid sole, mold-generated both as to material and form, having its upper edge substantially higher on the inner side of the shank than on the outer side thereof and provided with a feather edge extending beyond the attaching area.

8. An unattached solid rubber sole having one edge of the shank thereof higher than the corresponding opposite edge of the shank and provided with a feather edge extending beyond the attaching area.

9. An unattached vulcanized solid rubber sole of uneven thickness transversely thereof throughout its extent and having its upper edge substantially higher on the inner side of the shank than on the outer side thereof, the sole having a material longitudinal curvature along its generally central line from the ball region of the sole forwardly thereof and having a feather edge extending beyond the attaching area of the sole.

10. A shoe having a sole whose upper edge is substantially higher on the inside of the shank

than on the outer side thereof and which has a material curvature along its generally central line beginning at the ball region of the sole and extending forwardly thereof, said sole being substantially of uniform thickness along said line from a point adjacent the shank forward to the toe region thereof, a fabric piece having a strong bond with said sole, an inner sole cemented to said fabric except around the edges thereof, and a shoe upper having its lower edge conforming to the curvature of said sole and cemented between the edges of said fabric and said inner sole.

11. A shoe having a rubber molded sole whose upper edge is substantially higher on the inside of the shank than on the outer side thereof and which has a material curvature along its generally central line beginning at the ball region of the sole and running forwardly therefrom, a fabric piece having a vulcanized joint with said sole, an inner sole cemented to said fabric except around the edges thereof, and a shoe upper having its lower edge conforming to the curvature of said sole and cemented between the edges of said fabric and said inner sole.

12. An unattached vulcanized solid rubber sole having a fabric piece secured to its upper surface and adapted for use in attaching the sole to an upper, the sole having a materially higher edge on the inner side of the shank than on the outer, and having a material curvature along its generally central line from the ball region of the sole forwardly thereof, and being of substantially uniform thickness along said line from a point adjacent the shank forward to the toe region thereof and provided also with a feather edge extending beyond the line of attachment of said fabric.

13. A shoe having a solid sole, mold-generated both as to material and form, whose upper edge is materially higher at the inner side of the shank than at the outer side thereof and which has a material curvature from the ball area of the sole forwardly thereof, said sole being of substantially uniform thickness along its generally central line from a point adjacent the shank forward to the toe region thereof, a fabric piece having a strong bond with said sole, an inner sole cemented to said fabric except around the edges thereof, and a shoe upper having its lower edge conforming to the curvature of said sole and cemented between the edges of said fabric and said inner sole.

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