E. J. EMERY.

SOLE TAP FOR BOOTS AND SHOES.

APPLICATION FILED DEC. 22, 1919.

1,382,180. Patented June 21, 1921.

Fig. 1.

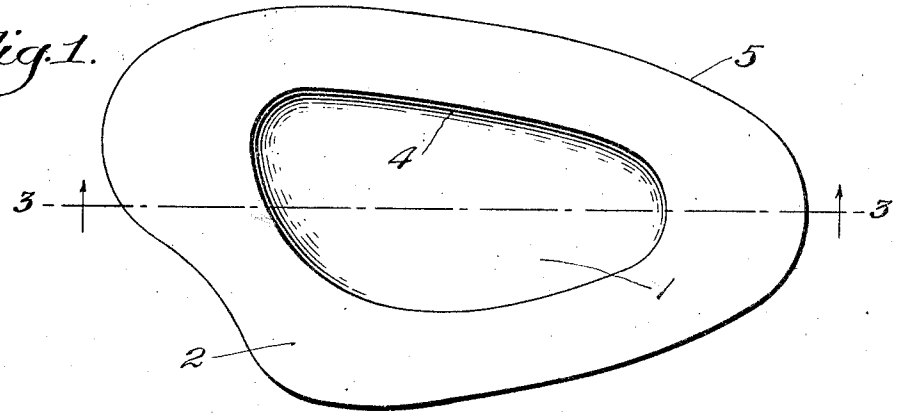


Fig. 2.

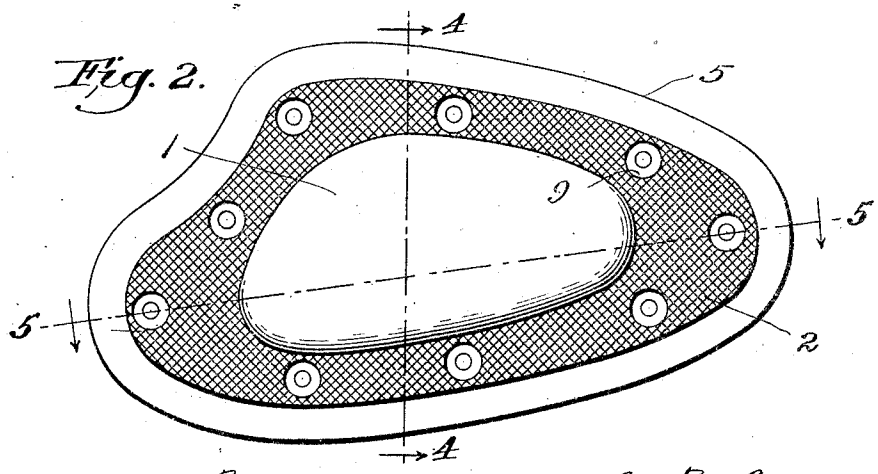


Fig. 3.

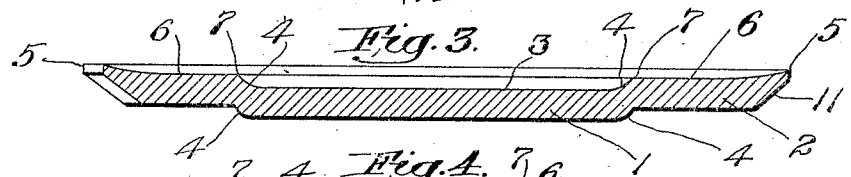


Fig. 4.

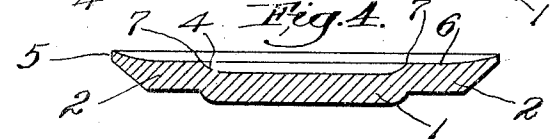
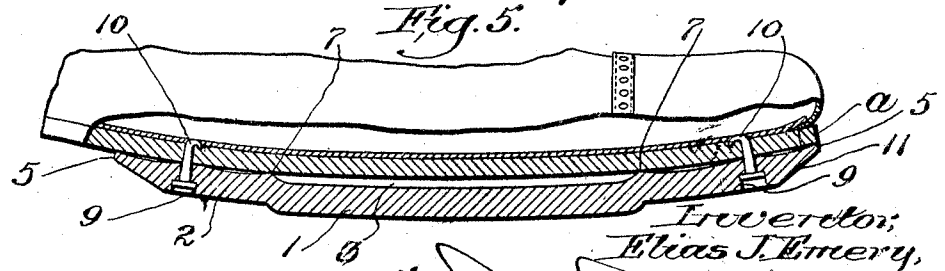


Fig. 5.



Inventor:
Elias J. Emery,
by Roberts, Roberts & Cushman
his Attys.

UNITED STATES PATENT OFFICE.

ELIAS J. EMERY, OF LYNN, MASSACHUSETTS.

SOLE-TAP FOR BOOTS AND SHOES.

1,382,180. Specification of Letters Patent. Patented June 21, 1921.

Application filed December 22, 1919. Serial No. 346,617.

To all whom it may concern:

Be it known that I, ELIAS J. EMERY, a citizen of the United States, and resident of Lynn, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Sole-Taps for Boots and Shoes, of which the following is a specification.

This invention relates to a tap sole for the repair or reinforcement of boots and shoes.

A principal object of the invention is to provide an article of manufacture adapted for attachment by the wearer or shoe-maker without skill, without special tools, and without the employment of cement, and which shall, when attached, constitute a resilient evenly-wearing surface having a marked cushioning effect, and which will not wear unduly in any particular region. The preferred material for the tap sole is a resilient composition of rubber, which may contain fiber or other ingredients, but which in any case possesses the properties of durability under wear, flexibility, and resilience.

In order to utilize these qualities to their full extent, my new article of manufacture is so arranged as to take advantage of the pneumatic spring constituted by a considerable bubble or volume of air trapped between the boot or shoe sole and the tap sole when the latter is applied, and one important object of the invention is to so devise the tap sole as to render the cavity containing air air-tight without the employment of unreliable cements.

In order to secure these qualities I provide the device with a sealing portion and with an air compressing portion made in such a way that the article can be made substantially of the same thickness throughout, except for a bevel at the edge, presently mentioned, the qualities above-mentioned being secured by control of the shape of the tap sole in cross-section. Economy of material and ease of making by molding operations are secured by these provisions.

In the accompanying drawings:

Figure 1 is a plan view of a sole for the left foot;

Fig. 2 is an under plan view of the same structure;

Fig. 3 is a vertical longitudinal section on line 3—3 of Fig. 1;

Fig. 4 is a vertical transverse section on line 4—4 of Fig. 2; and

Fig. 5 is a longitudinal vertical section through the article as applied to the sole of a shoe, illustrating its operative functions.

The sole tap may be made for soles of graded sizes and of any of several outlines corresponding to typical shapes of soles in wide use, of which the particular shape illustrated in the drawings is representative. This tap-sole may be made of rubber, a mixture of rubber and fiber, or of any other suitable composition having resilient flexibility and durable wearing qualities. In cross section, the sole-tap is of substantially uniform thickness, preferably from three-sixteenths to one-quarter inch.

A sheet of a suitable material such as mentioned, and of the order of thickness mentioned, is stiffly flexible, requiring considerable pressure to deform it, and regaining its molded or pressed shape speedily and energetically. These qualities are utilized by making the tap-soles of an impressed or molded form substantially as illustrated, and comprising a domed or protuberant and collapsible area 1 and a peripheral attachment margin 2, the concavity 3 within the domed area 1 being a space for trapped air adapted to be compressed under the wearer's tread upon the applied tap-sole. The collapsible area 1 is of something less than half the superficial area of one face of the tap-sole. The domed area 1 is offset from the margin 2 by the sloping edge 4, permitting the collapse of the material of area 1 into its own concavity upon upward pressure upon the material, and yielding for this compression by the bending of the portion 4 and the lateral compression and thickening of the adjacent portion of the margin 2 induced by this collapse.

Such collapse is resisted not only by the resilience of the material, but by air trapped under the dome 1 and between it and the shoe-sole *a*, Fig. 5. In order to permit this air-cushioning effect and in order to exclude water and dirt from the space between the sole *a* and the tap-sole, an effectively tight joint between the tap-sole and the shoe-sole, as against both the disruptive pressure of the interior compression and the capillary entrance from the exterior of water, is essential.

In order to secure an effective joint, the tap-sole is molded to the form in section illustrated in Figs. 3 and 4, and comprising the domed area 1 and slope 4, the outer edges 5 being upwardly displaced from the

level 6 of the upper surface of the margin 2, the margin 2 having inner edges 7 sharply marking the beginning of the slope 4.

Seats 9 for nails 10 in the form of recesses extending partly through the margins 2 at points near the middle line between the edges 5 and 7 are provided.

The bottoms of the soles *a* of the shoes or boots to be reinforced or repaired are curved both in a lateral and a longitudinal sense; the tap sole is applied by bending it to fit and driving nails against a clenching anvil inside the shoe. The effect of this is to compress the outer edge 5 against the sole, and at the same time to hold the inner edge 7 compressed against the sole, where it forms an air-tight packing against the air trapped in dome 1. When pressure is applied to dome 1 by treading upon it, the edge 7 is acted upon to force it against its seat with greater firmness, all of the weight transmitted through the sole being first taken by these edges before the collapse of the dome 1 begins, and being maintained by the thickening of the material under lateral compression due to its collapse even after the foot rests upon the margin 2 as well as the dome 1 at full treading pressure. The air seal at the edge 7 is reinforced by the sealing contact at edge 5, and by the substantial contact of all parts of the margin 2 with the sole *a* at full treading pressure.

These results could not be secured with success if the margin 2 were cemented in place, since the movement of the material under successive treading impulses would soon break a cemented joint, and the displaced fragments of cement would destroy the packing contact between the tap-sole and the leather shoe sole relied upon for the effective function of my device.

I prefer to bevel the outer under edge of the tap-sole at 11 to cause the forcible ejection of mud, water and wet snow from the edge of the shoe and away from the joint at edges 5. The bottom of the tap-sole may be roughened, figured or ornamented, as indicated in Fig. 2.

I claim:—

1. A tap-sole for boots and shoes adapted for attachment to the under side of the sole, having a stiffly flexible body of substantially uniform thickness throughout comprising a peripheral portion sloping upwardly toward the edge, and having a depressed central portion joined to the peripheral portion by a sloping offset, the margin of the offset and the peripheral edge being adapted when attached, by reason of the flexibility of the structure, to bear against the sole and form a double seal against air trapped in the depressed central portion and compressed by the collapse into the concavity thereof of the depressed central portion upon treading pressure by the wearer.

2. A tap-sole for boots and shoes adapted for attachment to the under side of the sole having a stiffly flexible body of substantially uniform thickness throughout, comprising a peripheral portion having an upper surface sloping upwardly toward the peripheral edge, said surface and peripheral portion being of substantially uniform width, to constitute a seat adapted to bear against the sole at its inner and outer edges, to form a double seal by pressure contact only of said edges with the sole against which it bears, the remaining central portion of the tap-sole being depressed to project from the bottom surface of the tap-sole and adapted to operate as a compressor for the contained air when collapsed within the peripheral portion under the tread of the wearer.

3. A tap-sole for boots and shoes adapted for attachment to the under side of the sole, comprising a stiffly flexible body of substantially uniform thickness of which the peripheral portion slopes upwardly toward the edge, and is adapted to be penetrated by fastening means for attachment to the sole, the body having a depressed central portion joining the peripheral portion by a sloping offset, the margin of the offset and the peripheral edge when attached bearing and being compressed against the sole to form a double seal against air trapped in the depressed central portion, the depressed portion occupying the area of the sole under the ball of the foot subjected in use to the greatest pressure and exposed to maximum wear.

4. A tap-sole for boots and shoes comprising an approximately flat member of substantially uniform thickness having its central portion including its upper and lower surfaces depressed relatively to the marginal portion, the upper surface of the marginal portion extending in a horizontal direction from its inner edge to its central region and thence sloping upwardly to the outer edge, and being adapted in use to be forced into contact with the boot or shoe sole at its inner and outer edges, thereby to seal without cementing and by said forcible contacts only against leakage of air trapped in the concavity of the depressed portion.

Signed by me at Boston, Massachusetts, this nineteenth day of December, 1919.

ELIAS J. EMERY.