W. CABLE.

RUBBER BOOT OR SHOE.

No. 256,544. Patented Apr. 18, 1882.

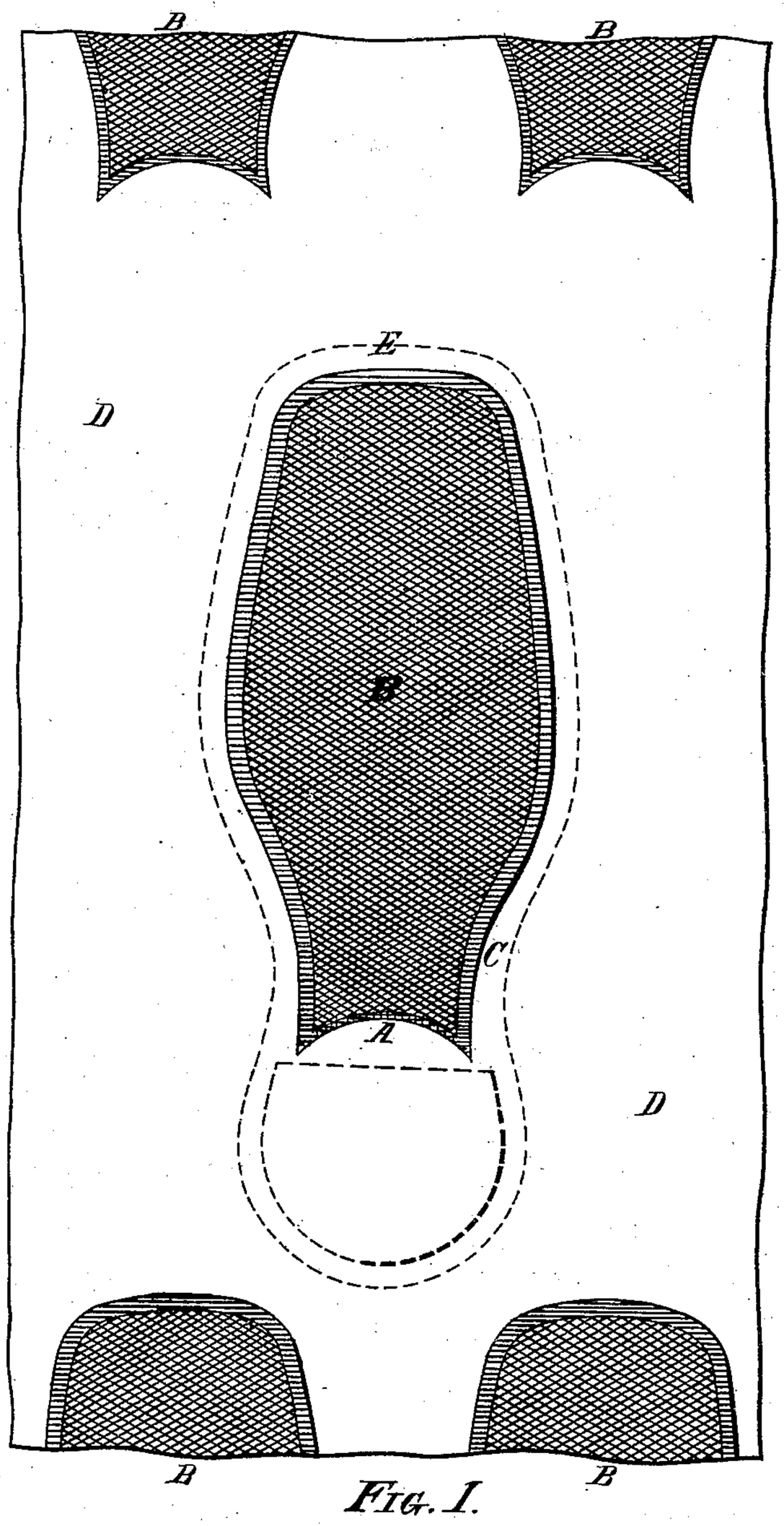

FIG. 1.

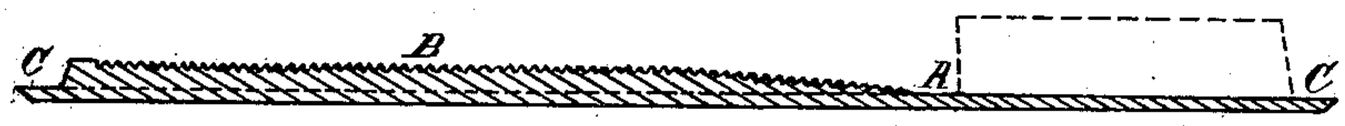

FIG 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

WHEELER CABLE, OF BOSTON, MASSACHUSETTS.

RUBBER BOOT OR SHOE.

SPECIFICATION forming part of Letters Patent No. 256,544, dated April 18, 1882.

Application filed November 10, 1879.

To all whom it may concern:

Be it known that I, WHEELER CABLE, of Boston, Massachusetts, have invented certain Improvements in the Manufacture of Rubber Boots or Shoes; and I do hereby declare that the same are fully described in the following specification, and illustrated in the accompanying drawings.

My invention relates to the formation of the sole and tap-sole of a rubber boot or shoe, and to the process herein described of constructing such articles.

My invention consists primarily in a rubber boot or shoe provided with a tap-sole of peculiar construction, growing gradually thinner in the shank part, and terminating near the heel.

It also consists in a rubber boot or shoe having a tap-sole formed integrally and simultaneously with the sole from homogeneous stock by passing the plastic compound between a smooth roller and a roller engraved or formed with depressions to correspond with the configuration desired in the tap-soles, said sole and tap being cut from the sheet of stock, with a margin, as described, which is turned up into contact with the upper, and all united by vulcanization.

It also consists in the improved process of making a rubber boot or shoe in which such combined sole and tap-sole are employed.

I make no present claim to the machine, or any of its parts by which my improved tap and sole are or may be produced. Such mechanism (original with me) will constitute the subject of another application for Letters Patent.

In the manufacture of rubber boots or shoes it has heretofore been common to shape the uppers while in an unvulcanized state over a last or form, apply thereto a suitably-cemented plastic sole, and subsequently cement thereon the heel and the outer or tap sole, which is usually cut from a sheet of rubber compound of uniform thickness and character of surface, the whole being afterward vulcanized. Immense losses result from this mode of applying the tap-sole separately over the sole proper, on account of blisters caused by the presence of air between the two when vulcanized. Such blisters, if large, render the boot unsalable and valueless; and if small, make it imperfect and unserviceable, because, if worn, the tap will speedily part from the sole and upper, and render the boot worthless. In either case the material and labor are thrown away. Millions of dollars are lost annually from this cause alone in the one item of rubber boots and shoes. Attempts have been made to overcome this difficulty from time to time, with but limited or partial success. The presence of the slightest particle of air between the sole and tap is sufficient to prevent a perfect union, and it is almost impossible to so join them as to exclude it completely under any plan heretofore adopted.

It has been noticed that the taps start from the soles first along the rear line of the tap adjoining the shank. To obviate this one manufacturer extends the tap about half-way back to the heel, its rear part cut from each side diagonally, and terminating in a diamond-like point in order to distribute the strain somewhat. Another party carries this idea still further, and extends the slender point of the tap far enough to the rear to be covered by the heel when applied, and thereby held to the sole. In either case the sole and tap are made separately and applied successively—the latter after and upon the former—united by cement and by subsequent vulcanization.

By my invention the sole and tap-sole are formed integrally and simultaneously by a rolling action, whereby the dies or depressions in the engraved roller determine the outlines and wearing-surfaces of the tap-soles. Consequently there is saved in this manufacture the separate cutting out of the tap-sole and the cementing of the same to the sole of the partially-formed shoe or boot, as well as the use of the calender in separately preparing the stock for the tap-soles. I also avoid the watchfulness and care required under the old process in order to apply the cemented sole and tap to each other at the moment when the cement is in just the condition to unite them most perfectly. Displacement of the tap upon the sole and the presence of blisters or flaws between them are rendered absolutely impossible by my improvement, which thus perfects and cheapens this class of merchandise and

enables me to give an ornamental border to the tap. The extension of the tap along the shank and its gradual thinning rearwardly to the heel give greater durability and a better finish than can otherwise be obtained.

In the drawings, Figure 1 represents the sole and tap-sole of a rubber boot or shoe with parts of others and a portion of the sheet of rubber compound, of which they form part under my invention, said sheet issuing continuously from the machine, of which the engraved roller is a part. Fig. 2 is a central longitudinal section of a sole and tap-sole cut from such sheet.

The position of the heel and the proper line for cutting the sole from the sheet are indicated by dotted lines.

A represents the sole, and B the tap-sole formed integral therewith. C is the projecting edge of the sole or a part of the sheet D from which it is to be cut along the dotted line E, so as to be turned up and cemented with the rest of the sole to the upper, both being of rubber compound in the raw or unvulcanized state, and adapted to unite readily and permanently under the heat of vulcanizing. The distance between the two forming and pressing rollers determines the thickness of the sheet D and sole A, and the thickness of the tap in its various parts depends on the depth of the depression in the engraved roller.

The surface of the tap B may be pebbled or ornamented in any manner desired by giving a corresponding form to the die in the roller, which reproduces its like with every revolution. An imitation stitch may thus be represented around the edges of the tap, or lines running parallel with the edge may be formed to give a finish and a characteristic effect to this tap unlike that obtained by cutting the tap from a sheet of uniformly pebbled or of plain ordinary stock.

Another peculiarity of my invention is the gradual thinning of the tap as it extends backward along the shank to, or nearly to, the heel. For many purposes it is advantageous to have a medium thickness of tap along the shank in addition to the sole proper. It is also desirable that the tap shall terminate at the heel, so that the foundation of the heel may be a plane, so as to fit the horizontal face of the heel applied thereon. The best results are therefore gained by gradually reducing the thickness of the tap along the shank and causing it to disappear at the base of the heel. Fortunately this tapering is exactly adapted to the capabilities of the machine and the peculiarities of the material. I am enabled to give a perfect finish to both edges and each end of this tap-sole by causing the sheet to emerge from between the rollers in the direction indicated by the arrow, Fig. 1—that is, with the toe of the soles first. The plastic compound will completely fill the angles at the front and sides of the tap, but would not fill and finish the rear edge perfectly, but would leave it rough and ragged were it angles and thickness the same as in front. By thinning rearwardly and finally merging it in the sole, as in Fig. 2, the tap comes from the die complete and perfect every time as an integral part of the sole and connecting sheet. My improved tap and sole may therefore be more rapidly and more perfectly formed by a rolling action than could the ordinary tap alone.

In making rubber boots and shoes by my invention or process the entire upper part above the sole is lasted or shaped up on a form as heretofore, then the combined sole and tap, together with the margin C cut from the sheet D, is cemented and applied in its proper position beneath the upper part, the heel similarly secured, and the whole placed in the heater and vulcanized.

I am aware of the patent to McBurney for india-rubber soles, dated April 5, 1859, reissued December 8, 1863, showing a combined sole, tap-sole, and heel formed and vulcanized together in a mold, with holes through the sole, tap-sole, and heel for sewing, pegging, or nailing to the upper-leather of a boot or shoe. Said patent contains no part of my invention, since the tap-sole does not taper rearwardly along the shank to the heel, the perforated sole, heel, and tap could not be formed by rollers, as herein described, and are not united by vulcanization to the uppers of rubber boots or shoes.

I claim as of my invention—

1. A rubber boot or shoe provided with a tap-sole formed in one with the sole, and constructed as herein described, extending backward about to the heel, gradually decreasing in thickness along the shank, and disappearing or becoming merged in the sole at or near the heel, substantially as set forth.

2. The improved process herein described of making rubber boots or shoes, said process consisting in shaping the upper over a last or form, rolling the integral sole and tap-sole as part of a continuous sheet of homogeneous rubber compound, cutting such combined sole and tap from said sheet with a thin projecting margin along the edges, turning up such margin, and cementing it with the integral sole and tap to the upper, subsequently applying the heel, and finally vulcanizing the whole, substantially as set forth.

WHEELER CABLE.

Witnesses:
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