

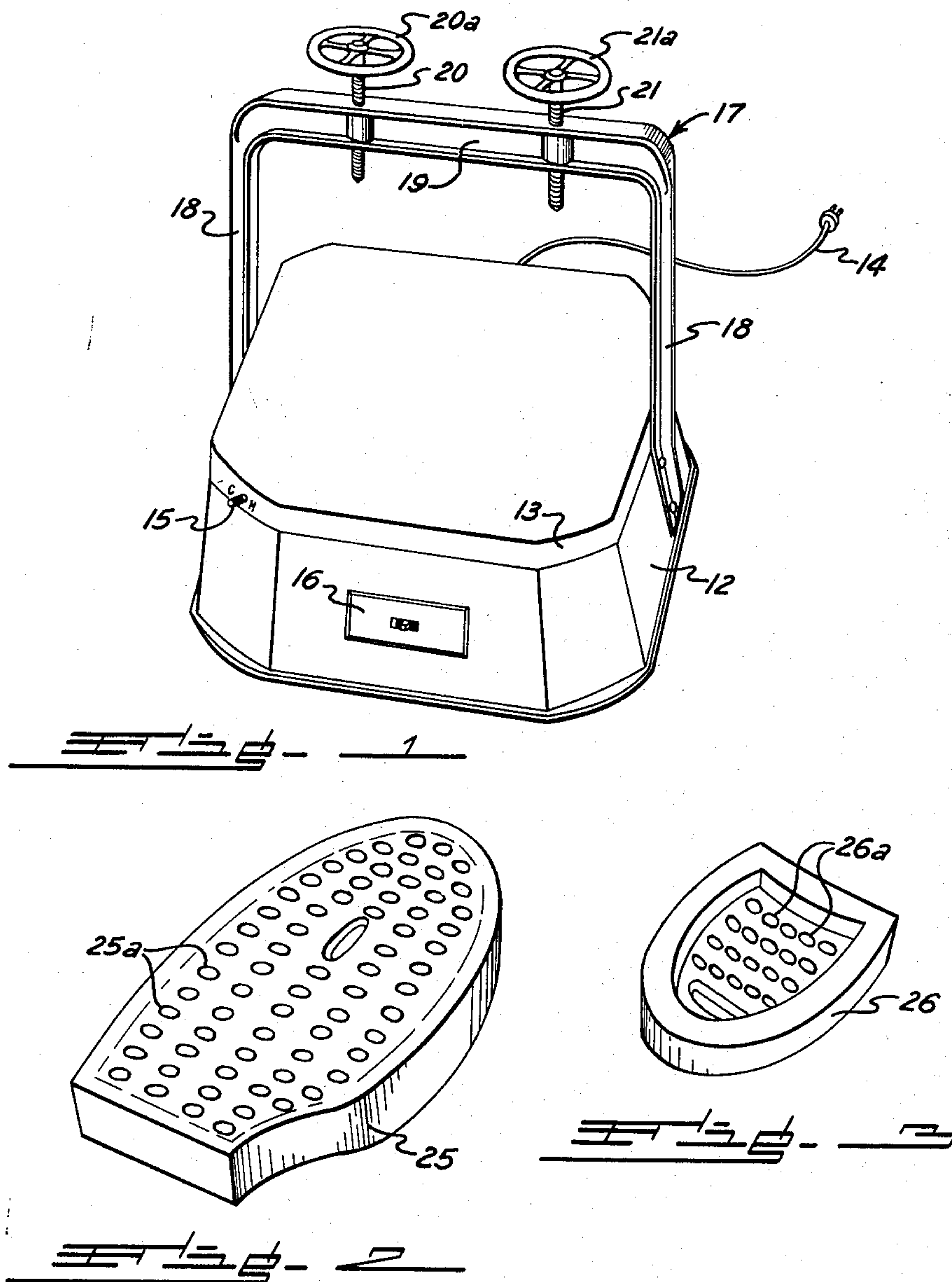
Nov. 17, 1953

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APPARATUS FOR SECURING A RESILIENT TREAD TO
THE BOTTOM SURFACE OF FLEXIBLE FOOTWEAR

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Filed Aug. 27, 1947

2 Sheets-Sheet 1



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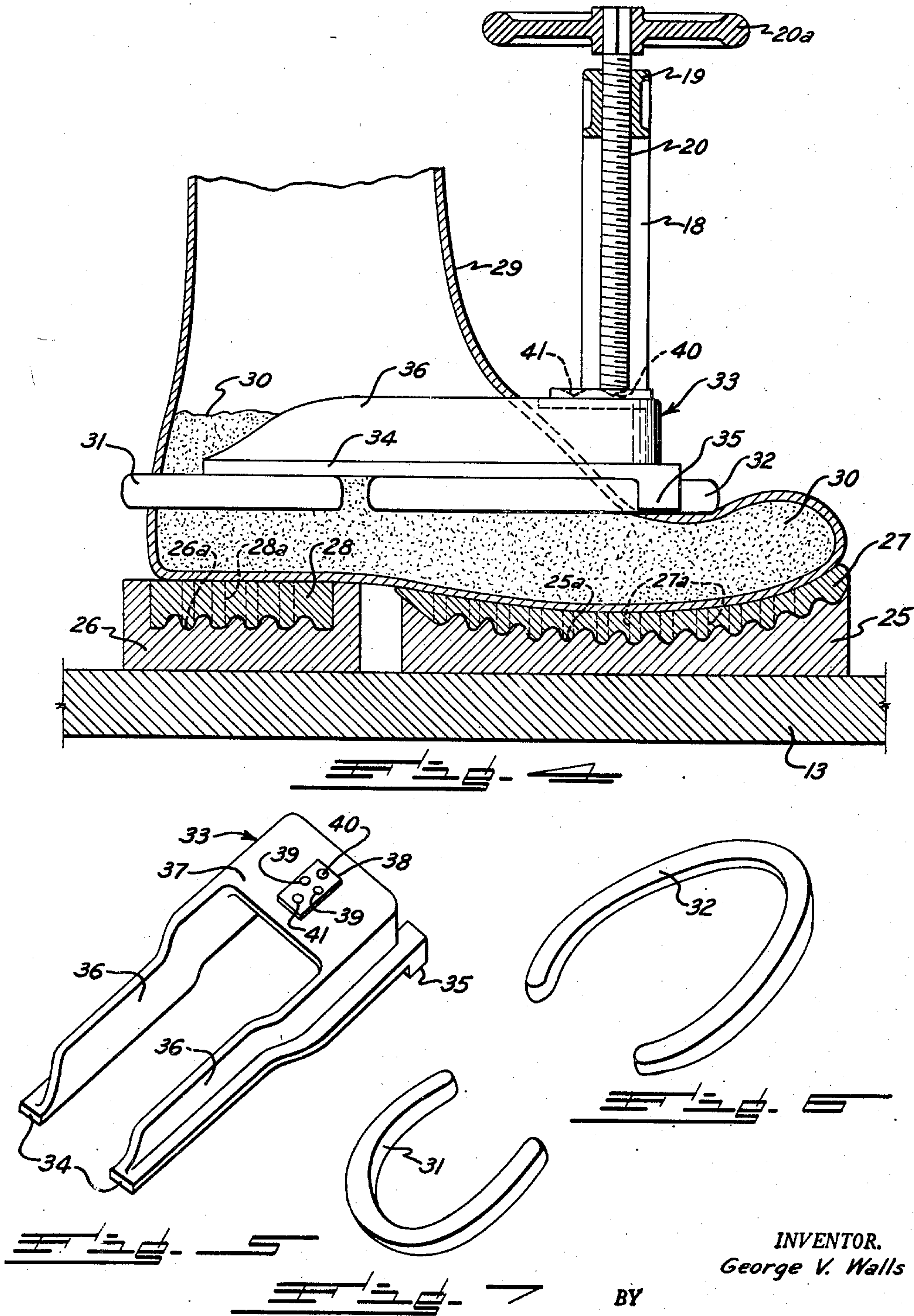
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APPARATUS FOR SECURING A RESILIENT
TREAD TO THE BOTTOM SURFACE OF
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1

The present invention relates to apparatus for securing a resilient tread to the bottom surface of flexible footwear. It has to do particularly, although not exclusively, with apparatus of a portable nature for securing a rubber sole or heel onto a boot or shoe having a flexible top.

Heretofore, boots, overshoes, rubbers, and other footwear have been rendered useless, and in most instances are discarded, after the sole and/or heel became worn down and smooth or contained wear holes. This condition has caused an enormous waste since, in most instances, the uppers of the footwear having worn soles and/or heels have remained in good condition.

It is one of the objects of the present invention to provide an improved apparatus or means for securing cured rubber soles and/or heels onto the uppers of boots, shoes, etc. formed from fabric, rubber and fabric composition, rubber, or leather.

Another object of the invention is to provide means for securing onto the worn sole and/or heel of a flexible top article of footwear or onto the leather sole of an article of footwear, a cured rubber sole and/or a cured rubber heel, in which both the sole and the heel are provided with air sealed pockets or suction cups.

A further object of the present invention is to provide an improved apparatus wherein a cured rubber sole and/or heel may be secured to a flexible top article of footwear while at the same time and in the same apparatus, a cured rubber sole and/or heel may be secured onto the leather sole and/or heel portion of a leather boot, shoe, or other article of footwear.

Another object of the present invention is to provide an improved apparatus or device for securing a cured rubber sole and/or heel onto the leather sole and/or heel portion of a boot or shoe, easily and effectively within a short interval of time and with a low heat condition.

A further object of the present invention is to provide an improved apparatus for securing cured rubber soles and heels onto shoes and the like within a short interval of time and by the application of a relatively low degree of heat, in which the apparatus is provided with interchangeable sole and heel molds and interchangeable parts for transmitting pressure to the shoe or other article of footwear to which the sole and/or heel are being secured.

A further object of the present invention is to provide improved securing means of the foregoing character which is provided with a removable pressure adapter by which the pressure

2

applied to the article of footwear during the bonding process may be applied in greater degree to either the toe end or the heel end of the article of footwear.

Another object of the present invention is to provide a novel pressure-applying means in which the flexible top article of footwear to which a cured rubber sole and/or heel are to be applied, is partially filled with a loose granular material, such as sand, which, because of its inherent nature, shifts and becomes compacted sufficiently to provide an extremely stiff or rigid support for the article of footwear undergoing the securing operation.

The foregoing and other objects and advantages of the present invention will appear from the following description and appended claims when considered in connection with the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In said drawings:

Fig. 1 is a perspective view of one form of securing means or apparatus embodying the present invention;

Fig. 2 is a perspective view of a sole mold for use with the apparatus;

Fig. 3 is a perspective view of a heel mold for use with the apparatus of Fig. 1;

Fig. 4 is an assembly view, partly in vertical section and partly in elevation, of a portion of the apparatus of Fig. 1 showing a rubber boot or overshoe in position during the operation of securing a cured rubber sole and heel thereto;

Fig. 5 is a perspective view of the pressure adapter shown in Fig. 4;

Figs. 6 and 7 are perspective views, respectively, of the substantially U-shaped toe and heel pressure members shown in Fig. 4.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. It is to be understood also that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring now particularly to Figs. 1 and 4 of the drawings, there is shown one form of securing device or apparatus embodying the present invention. It is shown in Fig. 1 and as shown,

3

comprises a base portion 12 having a heating plate 13 within which or beneath which is an electric heating element (not shown) which is preferably of circular formation and of 1,000 watt-110 volt power.

A suitable wire or cable 14 serves to direct current from an outside source to the heating element. There is also provided a thermostatic control for regulating the temperature of the heating element. This thermostat is not shown but at 15 there is shown a thermal control switch for actuating it. A current control "on and off" switch 16 is provided at the front of the base, as shown.

Extending upwardly from the base side portions is a substantially U-shaped metal frame member, shown as a whole at 17. This frame member 17 has side upright portions 18 and a substantially horizontal connecting portion 19 which overlies the base. Threaded through suitable threaded openings and adjustable up and down with relation to the base, is a pair of adjusting screws 20 and 21 having, respectively, operating handles 20a and 21a.

The heating plate 13 is adapted to receive and support two separate and independent shoe resoling and/or heel-applying units or assemblies, these assemblies being shown complete in Fig. 4. The assembly shown in Fig. 4 preferably comprises a mold 25 having a series of pockets or indentations 25a formed therein, a heel mold 26 also having indentations or pockets 26a formed therein. A cured rubber sole 27 having a series of air pockets 27a formed therein is preferably placed, within the sole mold 25, as seen in Fig. 4.

A cured rubber heel 28 having air-sealed pockets or suction cups 28a formed therein is positioned within the heel mold 26. The cured rubber sole 27 and the cured rubber heel 28, each having a plurality of air-sealed pockets or suction cups formed therein, form the subject matter of my co-pending application, Serial No. 718,357, filed December 26, 1946, now Patent No. 2,553,616 issued May 22, 1951 and are, therefore, not disclosed more fully herein, nor claimed per se in the instant application.

In practice, a flexible top article of footwear, such, for example, as a rubber boot 29, has the cured rubber sole member 27 and the cured rubber heel member 28 provisionally cemented to its undersurface or sole and heel portions, whereupon the flexible article and its attached sole and heel are positioned upon the molds 25 and 26, as clearly seen in Fig. 4.

It is, of course, desirable during the securing operation, to apply pressure to the article of footwear and its provisionally attached rubber sole and heel so as to hold the parts properly in the molds and also to hold the molds firmly in position upon the top surface of the heating plate 13. Therefore, in accordance with one phase of the present invention, the rubber boot or overshoe 29 is partially filled with sand, indicated at 30. Sand has the desirable characteristic of becoming compacted into a relatively solid or rigid mass, and when placed in the boot, will serve to provide its lower portion, in effect, with a solid filler or last-like block or core. Thus, any pressure applied to the boot in the region of the filling material 30 will be transmitted to the sole and heel units and to their respective molds and heating plate.

The adjustable pressure screw 20 is employed to apply the necessary pressure to the boot 29

4

during the securing operation. Preferably there is applied to the heel portion of the boot 29 a substantially U-shaped light-weight metal piece or pressure member 31 and to the toe or forward portion of the boot a generally similar, though somewhat larger, substantially U-shaped light-weight metal pressure piece or member 32. After the members 31 and 32 have been applied as clearly seen in Fig. 4, a metal pressure adapter, shown as a whole at 33, is slipped over the instep portion of the boot and overlies the pressure members 31 and 32. The pressure adapted 33 may be of any desired shape, but, as shown particularly in Fig. 5, comprises a pair of flat base portions 34 having depending lugs or extensions 35 at an end thereof. Upright portions or webs 36 extend substantially perpendicularly from the base portions 34, these vertical web portions being connected together by a horizontal portion or web 37. The horizontal web portion 37 is disposed at the end of the pressure adapter adjacent the depending lugs or feet 35. The horizontal web is provided with a bearing plate or block 38 preferably secured by screws 39 to the horizontal web and having, as shown, a pair of sockets or recesses 40 and 41 formed at its upper surface.

After the parts 31 and 32 have been assembled with the boot, the pressure adapter 33 is assembled with those parts to overlie them, that is portions of them, as seen in Fig. 4. If a superior force is to be applied to the forward portion of the boot, the socket 40 is brought into alignment with the screw 20 and the screw is threaded down until its lower end firmly engages in said socket, see Fig. 4. By tightening down the screw 20, the desired amount of pressure may be transmitted through the adapter 33, substantially U-shaped members 31 and 32, and the body or mass of sand 30 to the rubber sole and rubber heel, the molds and the heating plate to hold the parts in the positions shown during the securing operation.

If it is desired to apply a superior force or pressure to the rear portion of the boot 29, the pressure adapter 33 is shifted from the position shown in Fig. 4 so that the lower end of the adjustable pressure-applying screw 20 may seat in the recess 41.

The sand 30 serves as a rigid, though removable, filling for the boot during the securing step and also serves to conduct and dissipate excess or surplus heat from the heating element within the base of the apparatus. By virtue of the arrangement provided in the present structure, the cured sole 27 and the cured heel 28 may be quickly and easily secured to the undersurface of the boot or overshoe 29. It will be understood that the parts disclosed in Figs. 4 to 7, inclusive, may be positioned on the heating plate 13 so as to cooperate with either the left pressure-applying screw 20 or the similar pressure-applying screw 21 shown at the right of Fig. 1.

While reference has been made to certain types of footwear, such, for example, as rubber boots, overshoes, rubbers, etc., the invention is equally well adapted for the securing onto any type or kind of footwear in the class known as "flexible top" footwear.

In the preceding description, the low heat requirement of the present invention has been described. It should be understood that the initial cementing of the cured rubber sole or heel unit, while establishing the proper position, does not per se provide the necessary bonding. Such

5

bonding is achieved primarily because of the equalized pressure distribution which is maintained throughout the relatively short heating interval. As a result the cured rubber article is caused to adhere to the article of footwear to such a degree that it will withstand long periods of rough usage without any lessening of the bond.

The provision of the air-sealed recesses in the sole and heel units is desirable for two reasons. In the first place, it creates a suction cup effect in holding such units on the original sole, and in addition provides a cushioning effect in wear that absorbs shock or impact and also has heat-insulating value.

Since the soles and heels referred to herein are utilized as wear-resistant treads of the articles of footwear to which they are applied, the expression tread will be used in this specification as a generic term to designate either a sole or heel unit.

Having thus described the invention, what is claimed is:

1. Apparatus for securing a resilient tread on the bottom of footwear, comprising a heat conductive mold adapted to support said tread and said bottom in position on said tread, said mold having an upper surface conforming to the shape of the lower surface of said tread, a heating plate adapted to support said mold, means including a threaded clamp member for applying a uniformly distributed pressure on the upper surface of said bottom toward said mold, and said means also including a granular material partially filling said footwear, two U-shaped members encircling the lower portion of the upper of said filled footwear, a U-shaped clamp engaging both of said U-shaped members and overlying portions of both U-shaped members, said clamp having downwardly extending cleats to engage

6

the sides of one of said U-shaped members, and a block on said U-shaped clamp having a plurality of spaced depressions adapted to engage said threaded clamp member and vary the relative pressure on said U-shaped members.

2. Apparatus for securing a resilient tread having cup shaped depressions in the upper surface on the bottom of flexible footwear, comprising a heat conductive mold having depressions on its upper surface adapted to be aligned with the depressions formed in said tread, said mold being adapted to support said tread in position on said bottom with the upper surface of said tread in contact with the lower surface of said bottom, a heating plate adapted to support said mold, and means for applying uniformly distributed pressure on the upper surface of said bottom, said means including a supply of loose granular material partially filling the footwear, a pressure adapter shaped to encircle said bottom and embrace a major portion of the lower portion of the upper to transmit downward pressure, and screw means for applying downward pressure on said adapter.

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