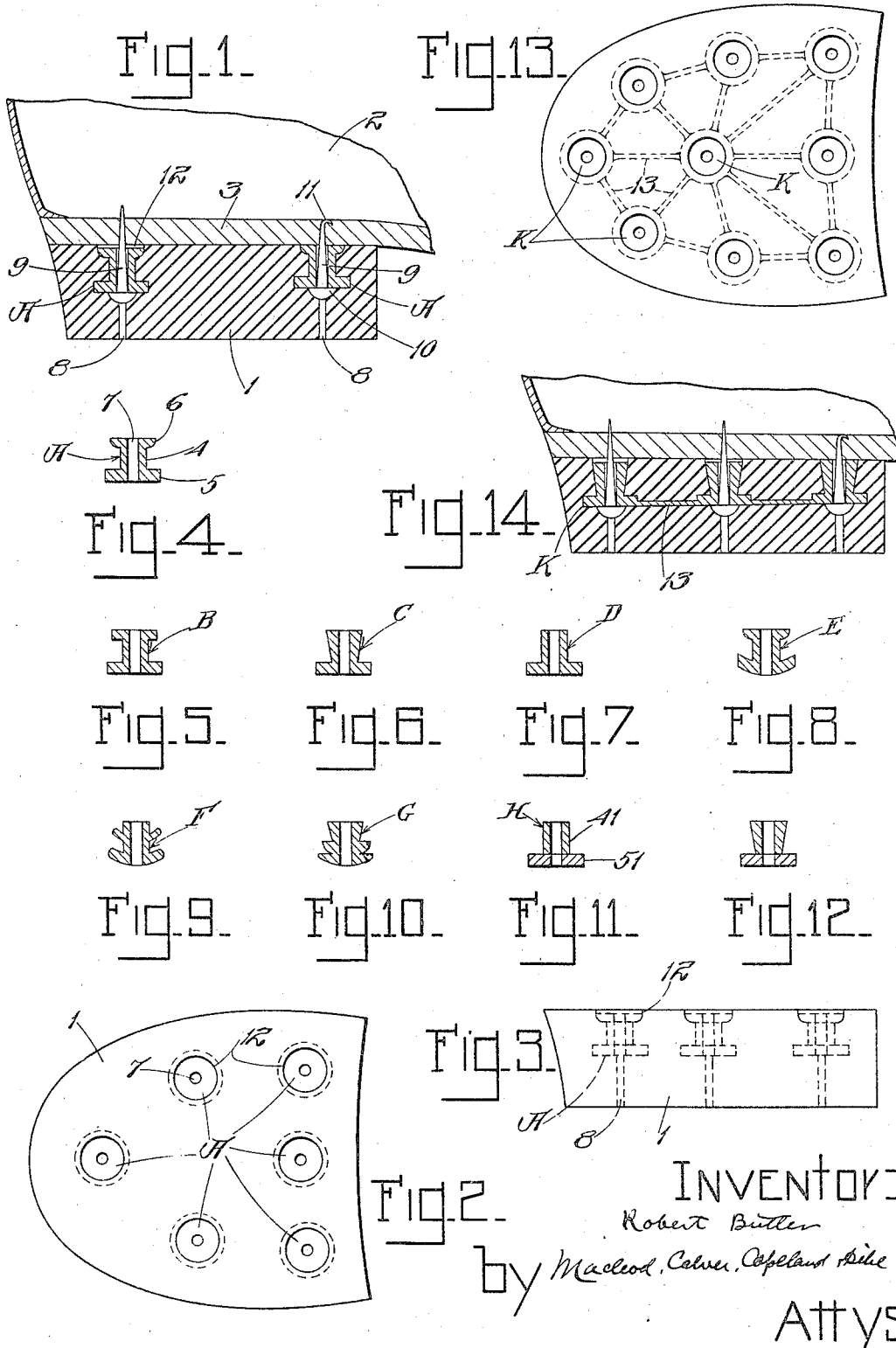


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 MEANS FOR ATTACHING A RESILIENT CUSHION TO A RIGID BASE.
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MEANS FOR ATTACHING A RESILIENT CUSHION TO A RIGID BASE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT BUTLER, citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Means for Attaching a Resilient Cushion to a Rigid Base, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a new and useful improvement in means for attaching cushion heels or other resilient cushions to a rigid base. For convenience of description the invention will be more particularly described and illustrated as applied to a rubber heel. In rubber heels which are made as a separate article of manufacture to be attached to leather shoes, it is common to provide a metallic washer of some form embedded within the body of the heel through which the attaching nails are driven to attach the rubber heel to the heel seat of the shoe.

It has also been the practice in attaching rubber heels not to clench the nails for the reason that it is impossible to clench a nail properly with the head of the nail drawn against a rubber bearing. Any nail driven so as to hold against a compressed resilient substance is constantly being pulled out by a force which is sufficient to unseat the nail under the changing stress due to daily wear, as instanced by the ready manner in which a rubber heel under service becomes detached from the shoe.

Small pebbles and other substances readily enter the open portion of the nail hole between the countersunk head of the nail and the tread face of the heel. This forms a sort of nail punch which presses on the head of the nail. If the attaching nail is driven entirely through the leather heel seat and clenched as well as may be on the inside of the shoe, or if it is driven nearly through and left unclenched, the action in wearing, taken in connection with the compressibility of the rubber of the heel between the upper face of the washer and the leather lift or heel seat, frequently causes this foreign matter to force the point of the nail up into the inside of the shoe.

The object of the present invention is to provide a combination of washer and bushing or the like, of such a character and so located within the rubber heel that when

the heel is attached to the shoe the leather heel seat will form a rigid stop for the upper end of the bushing so that after the nail is driven in and clenched on the inner side of the shoe the nail will be held rigidly in place and any additional pressure on the head of the nail will not force the nail any farther upward, neither will the nail be pulled out nor will the shank of the nail be slidable with reference to the bushing and washer when the rubber heel is compressed in walking. This object is attained by constructing the device in the form of a metallic tubular stud which is embedded in the rubber in position so that one end of the stud will extend nearly to the upper surface of the rubber heel while the other end of the stud extends to some distance into the interior of the rubber heel. The stud is provided with suitable flange portions or other projections which will form a firm anchorage to prevent the stud from being movable longitudinally, that is, toward either face of the rubber heel after the heel is once formed, and so situated that when the nail is driven in and clenched it will draw the heel up against the heel seat and compress the rubber so that the upper end of the stud will engage the under side of the leather lift or heel seat to which the rubber heel is attached. The tubular stud may be either integral with the flange and washer portions or it may be a stud seated between the washer and the heel seat.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a sectional view showing a portion of the shoe having a rubber heel attached thereto constructed in accordance with the invention, one of the nails being shown clenched after it is fully set up, and one of the nails being shown driven in far enough for the head of the nail to engage the flange of the stud but not driven in far enough to force the upper end of the stud into engagement with the heel seat.

Fig. 2 is a plan view of the upper face of a heel embodying the invention.

Fig. 3 is a side elevation of the heel shown in Fig. 2.

Fig. 4 is a detail view in section showing

one of the studs before it is molded into the heel.

Figs. 5, 6, 7, 8, 9, 10, 11 and 12 show various modifications of the studs.

5 Fig. 13 is a plan view of a heel showing another modified form of construction in which the studs are joined together by arms, thus forming a skeleton.

10 Fig. 14 is a sectional view showing a heel of the modified form shown in Fig. 13 partially attached to the heel seat of a shoe, one of the nails being shown clenched and the other nails being shown partially driven in but before the heel is fully drawn up to bring the studs into engagement with the heel seat.

15 Referring now to the drawings, 1 represents the body of a rubber heel embodying the invention, 2 the upper of a shoe, and 3 the heel seat to which the rubber heel 1 is attached. Embedded within the rubber heel are a plurality of tubular studs A which are preferably molded into the heel during the formation of the heel. These studs are 25 formed with a shank portion 4, a flanged head 5 on the lower end, that is the end which is toward the tread surface of the heel, and a flange 6 on the upper end, that is the end which is toward the heel seat. The stud is also formed with a central aperture 30 7 extending entirely through the stud for the passage of the fastening nail. The stud is so located in the heel that the upper flange 6 will preferably be a little below the upper or attaching face of the heel, the upper face of the rubber being formed with cupped out recesses 12 over the flanges 6 to allow compression of the rubber to bring the flanges to the surface. The shank 4 is of sufficient 40 length so that the lower flange portion 5 will be embedded well within the heel, preferably about in the middle between the top and bottom. The heel is formed with a nail hole 8 extending from the tread surface of the heel inward to connect with and in alignment with the aperture 7 in the stud so that the nail will be accurately guided to the aperture in the stud.

45 The heel will be provided with a sufficient number of studs to accommodate as many nails as are desired for the purpose of attaching the heel to the heel seat.

50 In attaching the heel to the leather heel seat, the heel will be properly positioned on the heel seat and the nails 9 will be inserted into the nail holes 8 and through the apertures in the studs and driven into the heel seat, the nails preferably being of sufficient length so that when the nail is driven in far 55 enough for the head 10 of the nail to engage the lower flange 5, the point of the nail will have been driven through the leather heel seat and may be clenched. It will be noted that when the heel is just seated on the heel seat and the head of the nail is just seated on 60

the lower flange 5, as shown in connection with the left hand stud in Fig. 1, the upper flange 6 will not be in contact with the heel seat but the elasticity of the heel is sufficient so that the heel will be compressed by 70 drawing up and clenching the nail, thus causing the flange 6 to engage the leather heel seat solidly, as shown in connection with the right hand stud in Fig. 1. This is due to the compressibility of the heel, and not to movement of the stud. In Fig. 1 the left hand one of the nails is shown as driven in far enough for the head to be seated on the lower flange 5, but it is not drawn up and clenched, so that the flange 6 is not in engagement with the heel seat. The other nail is shown clenched and the stud is in engagement with the heel seat. When thus clenched, the head 10 of the nail being in engagement with the lower face of the flange 5, and the clenching point 11 being hooked 75 over and engaging the inner face of the heel seat, the flange 6 presses against the lower face of the heel seat and the stud is held rigidly so that the stud and nail cannot move relative to the heel seat either up or down. 80

It is understood that although the nail hole 8 in the rubber heel is shown of smaller diameter than the diameter of the head 10, 85 the rubber will readily yield to allow expansion of the aperture in the rubber during the driving in of the nail and permit the head of the nail to pass through the aperture in the rubber far enough for the head 100 of the nail to engage the flange 5 of the tubular stud. The resiliency of the rubber heel will cause the hole to close in again to its normal diameter, as shown in Fig. 1, partially covering the head of the nail. 105

If the nail hole 8 becomes filled with pebbles or other matter during the wear of the shoe, the upward pressure thereof on the head 10 will fail to force the nail upward any farther than its normal position, as shown in Fig. 1, because the pressure of the head of the nail on the flange 5 will be resisted by the pressure of the flange 6 against the under side of the heel seat. The clenching of the nail draws the 115 heel seat or sole firmly against the tubular stud and holds the same rigidly in place, and also the stud serves to hold the nail rigidly in place.

120 In Figs. 5 to 10 inclusive the studs B, C, D, E, F, G, respectively, are modified forms of anchoring construction all formed integral with the stud and which will be evident without detailed description of the same. 125

In the modification shown in Fig. 11 the body of the stud H is made separate from the flange or washer portion 51 but the stud and washer are molded or set into the rubber heel in such relation that when the nail 130

is clenched the washer 51 is in contact with the lower end of the stud 41 which thus forms a rigid stop for the washer 51, the upper end of the stud 41 coming flush to the upper face of the rubber heel so that it will engage the lower face of the sole or leather heel seat in the same manner as shown in Fig. 1.

In the modification shown in Fig. 12 the washer is also made separate from the stud, thus differing from Fig. 11 only in the flaring form of the stud to afford a little more secure anchorage, the same as shown in Fig. 6.

In the modification shown in Figs. 13 and 14, the studs K are shown tied together by slender arms 13, thus forming a skeleton frame which provides for additional anchorage, but the connecting arms are sufficiently slender so that they do not materially reduce the strength or resiliency of the heel.

While I have referred to the body of the heel as being composed of rubber, I do not intend to be limited to the use of india rubber, but intend the term to be understood as including a heel made of any yielding, resilient material or composition.

The washer or stud is preferably made of metal but may be made of any other suitable material of sufficient strength and rigidity to retain its position unyieldingly in a longitudinal direction, that is vertically, in the wear of the shoe, although the body of the heel between the tread surface and the flange 5 may be compressed during walking. For instance, compressed fiber or wood or composition material of various kinds may be employed. It is not intended herein to limit the construction to any special kind of material but is intended to include any material or composition of suitable character to serve the purpose above described.

While I have described the invention particularly as applied to a heel, it is adapted for attaching a sole to a shoe or for application to any resilient cushion, buffer or the like which is to be attached to a comparatively rigid base.

What I claim is:

1. In combination with a resilient cushion, a plurality of tubular studs embedded in the cushion, the lower ends of which are a considerable distance above the wearing face of the cushion and the upper ends of which extend nearly to the upper or attaching face of the cushion, the cushion being adapted for attachment to a rigid base by nails whereby when the cushion is attached to the base the cushion may be compressed to cause the upper ends of the studs to engage with the under face of the base.

2. In combination with a resilient cushion, a plurality of tubular studs embedded in the cushion, the lower ends of the studs

being a considerable distance above the wearing face and below the attaching face of the cushion, the upper ends of the studs extending upward to a short distance below the upper or attaching face of the cushion, and the upper face of the cushion being formed with recesses leading to the upper ends of the studs.

3. In combination with a resilient cushion, a plurality of tubular studs embedded in the cushion, the lower ends of which are a considerable distance above the wearing face of the cushion and the upper ends of which extend nearly to the upper or attaching face of the cushion, the cushion being adapted for attachment to a rigid base by nails whereby when the cushion is attached to the base the cushion may be compressed to cause the upper ends of the studs to engage with the under face of the base, said studs being formed with lateral projections which form anchors to hold the studs against displacement.

4. In combination with a cushion heel, a plurality of tubular studs embedded in the heel, the lower ends of said studs being in the interior of the heel a considerable distance above the tread face of the heel, and the upper ends extending nearly to the upper or attaching face of the heel, the heel being adapted for attachment to a shoe by nails, whereby when the heel is attached to a shoe the heel may be compressed to cause the upper ends of the studs to engage with the under face of the heel seat.

5. In combination with a cushion heel, a plurality of tubular studs embedded in the heel, the lower ends of which are in the interior of the heel a considerable distance from both the upper face and the tread face of the heel, and the upper ends of which extend nearly to the upper or attaching face of the heel whereby when the heel is attached to a shoe said upper ends of the studs will engage with the under face of the heel seat, said studs being formed with lateral projections which form anchors to hold the studs against displacement within the body of the heel.

6. In combination with a cushion heel, a plurality of tubular studs embedded in the heel, the lower ends of which are in the interior of the heel a considerable distance from both the upper face and the tread face of the heel, and the upper ends of which extend nearly to the upper or attaching face of the heel whereby when the heel is attached to a shoe said upper ends of the studs will engage with the under face of the heel seat, said studs being formed with lateral projections which form anchors to hold the studs against displacement within the body of the heel, the heel also being formed with nail holes extending from the tread face of the heel inward to and in aline-

ment with the apertures in the tubular studs.

7. In combination with a cushion heel, a plurality of tubular studs embedded in the heel, the lower ends of which are in the interior of the heel a considerable distance from both the upper face and the tread face of the heel, the upper ends extending up to a short distance below the upper or attaching face of the heel, the heel being formed with recesses in the upper face in alinement with and extending downward to the upper ends of the studs, the heel being formed with nail holes extending from the lower or tread face of the heel upward to and in alinement with the apertures in the tubular studs, the heel being of sufficient compressibility whereby the heel may be compressed

to bring the upper ends of said studs into engagement with the heel seat by nails inserted into the studs and driven into the heel seat and clenched.

8. In combination with a cushion heel, a plurality of tubular studs embedded in the heel, the lower ends of which are in the interior of the heel a considerable distance above the tread face and below the attaching face of the heel, the upper ends of which extend upward to a short distance below the upper or attaching face of the heel, and the upper face of the heel being formed with recesses leading to the upper ends of the studs.

In testimony whereof I affix my signature.

ROBERT BUTLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."