Sept. 28, 1926. 1,601,700

S. O. MORRISON

VACUUM CUSHION INSERT FOR SHOE TREADS

Filed Oct. 10, 1921

Fig. 1.

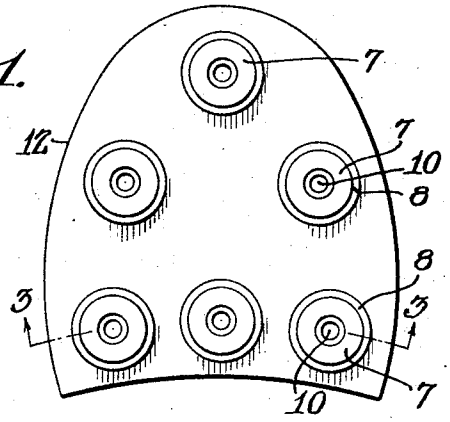




Fig. 2.

Fig. 3.

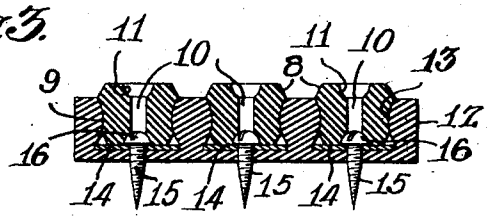


Fig. 4.

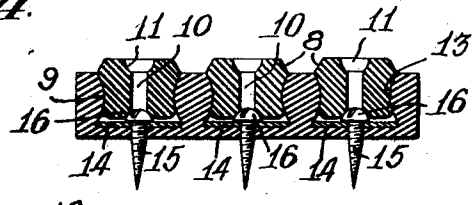
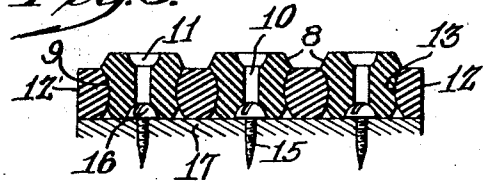


Fig. 5.



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UNITED STATES PATENT OFFICE.

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VACUUM-CUSHION INSERT FOR SHOE TREADS.

Application filed October 10, 1921. Serial No, 506,847.

My invention relates to vacuum cushion inserts for shoe heels or soles.

The purpose of my invention is to supply vacuum cushion inserts for shoe heels or shoe soles that are at once inexpensive, resistant to wear and easily renewable by the wearer.

A further purpose is to supply a vacuum cushion insert for shoe heels or shoe soles, viewed as treads and illustrated here by a heel, with reversible ends so that when one end becomes worn, through use, the wearer may pull out the insert and reverse it end for end wearing it thus reversed until the other end is worn down, when it may be taken out and a new insert put in.

A further purpose is to supply an insert having an opening through it terminating in cups at the ends, the insert being reversible end for end and the outer cup with the longitudinal hole through the insert serving to make the insert into a pneumatic cushion for the pressure of the step and a vacuum cup to prevent slipping as the shoe is lifted.

Further purposes will appear in the specification and claims.

I have preferred to illustrate my invention by but one main type, selecting a type that is at once practical, reliable and inexpensive and which at the same time well illustrates the principles of my invention.

Figure 1 is a bottom plan showing my vacuum cushion inserts in a heel.

Figure 2 is a sectional perspective view of one of my inserts.

Figure 3 is a section taken upon line 3—3 of Figure 1, showing the inserts before use.

Figure 4 corresponds with Figure 3, except that the inserts have been reversed end for end after use.

Figure 5 is a section corresponding with Figure 3 but showing a modification.

Similar parts in the different figures are designated by the same numerals.

Describing the invention shown, by way of illustration and not in limitation:—The insert 7, preferably of resilient material such as rubber, has the ends beveled on the outside at 8 and is concaved at 9 between the two bevelled portions. The longitudinal passages 10 end in outer and inner cups 11. A number of these inserts are forced into recesses at appropriate points in a heel or sole, illustrated by heel 12 having openings 13 to conform with the concave surfaces of the inserts. These openings do not pass through the heel.

A washer 14 and screw or nail 15 with head 16 are conveniently placed in the recess 13 beneath the insert 7, the head 16 of the nail or screw seating in the cup 11 of the insert. The heel or sole is also preferably of resilient material, such as rubber, and the screw or nail 15 and washer 14 conveniently serve a double purpose of supporting the insert and of holding the heel or sole 12 to the shoe (not shown).

In Figure 5 there is a slight modification in that 12′ is an outer section of a heel or sole suitably fastened to an inner section 17. The recesses 13 here pass all the way through the material of 12′ and the washer 14 may be omitted.

The insert shown is inexpensive and effective and is reversible after it has been used. The cushioning effect is much more marked, for the quality of rubber used, than in the case of solid rubber heels and the vacuum effect is obtained without sacrificing any of the cushioning benefits. The fastening devices for holding the body of the heel in place are readily accessible through removal of the inserts or may be applied separately between the inserts and my invention is applicable to full heels as well as half heels and to leather heels and soles as well as to those made of rubber.

The passages through the middle of the inserts give room for them to compress radially when they are inserted, resulting in a radial expansion of the entire inserts which is effective to hold them tightly against the convex walls of the openings and support them against withdrawal. The same radial pressure of the side walls of the inserts against the openings prevents excessive crowding of the reversed inserts into the openings, so that they hold their positions with less support from the screw or nail heads than would otherwise be the case.

For these reasons I do not require flanges upon the inserts to hold them to their duty and my inserts are distinguished by radial compression as distinguished from axial expansion or distension.

If the inserts be larger than the openings there will be radial compression of the inserts and of the material of the surrounding

openings at all times. Whether they be of the same size as the openings or not there will be radial expansion of the inserts with pressure in use tending to increase the friction between the side walls of the inserts and those of the openings and to further increase the interlocking in a radial direction between the larger parts of the inserts and the smaller parts of the openings. The friction and interlocking both hold the inserts against withdrawal and with pressure to an increased degree both prevent the inserts from being crowded down full into the openings.

The concavity of the side walls of the inserts in longitudinal section causes a large part of the radial expansion by reason of the axial compression of the inserts to take place outside of and within the outer part of the openings resulting in very satisfactory support of the inserts so as to utilize the outer parts of the insert to a maximum and to tighten the joints between the inserts and the openings.

Support of the inserts from the bottom wall as in Figure 5 of the openings is not objectionable in itself but is merely not as necessary with the present form as it would be if the inserts were convex in longitudinal cross section.

The inserts can be seated by pressure merely and give good service without any separate holding means other than the mere friction of the side walls. The insert need not be compressed at all when in position—i. e., may be the exact size of the hole. However a slightly larger diameter, providing for slight radial compression when in position, is of advantage.

The passages through the inserts afford easy means of removal through the insertion of any pointed tool.

It is my purpose to include in my claims all such modifications as would occur to those skilled in the art in view of the disclosure herein and as fall within the reasonable spirit and scope of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a shoe tread, a plurality of resilient inserts normally projecting from the tread, forming hollow annular cushion treads, reversible end for end, having bevelled and cupped inner and outer ends and concave circumferential bearing surfaces between the ends fitting snugly in recesses in the tread.

2. In a shoe tread, a tread section in combination with a resilient insert normally projecting from the tread section and forming an annular cushion, reversible end for end and having a central longitudinal passage to give space for an air cushion.

3. In a shoe tread, a tread section in combination with a resilient insert normally projecting beyond the tread forming a hollow annular cushion, reversible end for end, and having bevelled and cupped inner and outer ends, a concave circumferential bearing surface fitting snugly in a recess in the tread, and a central longitudinal passage to give additional space for an air cushion.

4. In a shoe tread, a tread section having an opening therein flared inwardly and outwardly from the interior in combination with an apertured resilient insert therefor less than one-fifth of the surface area of the tread section, normally projecting beyond the tread and fitting the flares and adapted to be spread radially into tighter contact with the flares by pressure axially of the insert.

5. In a shoe tread, a tread section and retaining devices therefor, in combination with a plurality of resilient hollow annular cushion inserts, each of small area as compared with the tread section, normally projecting beyond the tread section, reversible end for end with bevelled and cupped inner and outer ends and concave circumferential bearing surfaces tightened at the outer portions by pressure, the cups at the outer end forming spaces for air cushions and the cups at the inner end forming bearing surfaces to fit against the retaining devices.

6. In a shoe tread, a tread section, retaining devices therefor and a plurality of resilient hollow annular cup cushion inserts, adapted normally to project beyond the tread, reversible end for end, with bevelled and cupped ends, concave circumferential bearing surfaces, and central longitudinal passages, the central longitudinal passages together with the cups at the outer ends forming spaces for air cushions and the cups at the inner ends forming bearing surface to fit against the retaining devices.

7. In a shoe tread, a tread section in combination with a plurality of resilient inserts normally projecting beyond the tread section forming cushion treads, reversible end for end, having bevelled ends and concave circumferential bearing surfaces between the ends fitting snugly in recesses in the tread section, and with central longitudinal passages through the inserts.

8. In a shoe tread, a tread section in combination with a plurality of resilient inserts therefor having concave circumferential side portions fitting corresponding openings in the tread and projecting cushion and vacuum cups extending beyond the tread.

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