No. 745,393. PATENTED DEC. 1, 1903.

L. F. SMALL.

SHOE HEEL.

APPLICATION FILED JUNE 16, 1902.

NO MODEL.

Fig. 1.

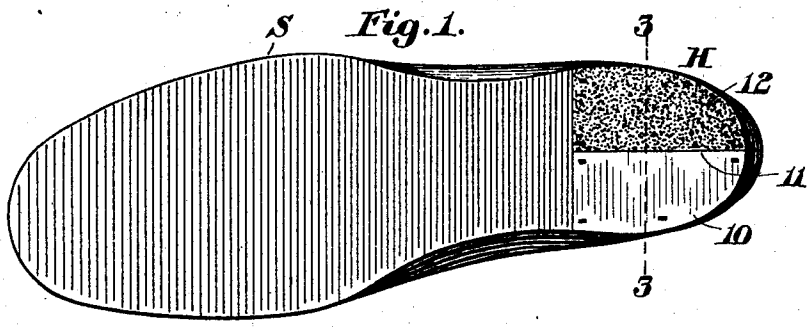


Fig. 2.

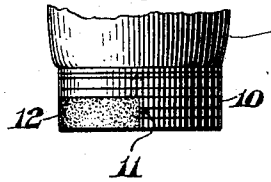


Fig. 3.

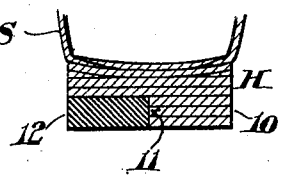
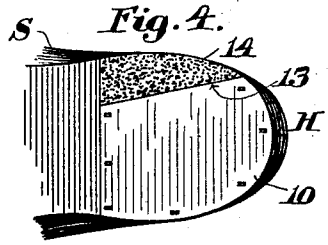


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 745,393. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

LEWIS F. SMALL, OF BRAINTREE, MASSACHUSETTS.

SHOE-HEEL.

SPECIFICATION forming part of Letters Patent No. 745,393, dated December 1, 1903.

Application filed June 16, 1902. Serial No. 112,010. (No model.)

To all whom it may concern:

Be it known that I, LEWIS F. SMALL, a citizen of the United States of America, and a resident of Braintree, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Shoe-Heels, of which the following is a specification.

My invention relates to heels for boots and shoes, and, although of general utility, is particularly useful in its application to orthopedic practice.

In walking the heel of the human foot naturally first contacts with the ground or other supporting-surface at its outer rear portion, then as the weight of the body fairly falls upon the leg the outer forward portion of the heel comes into contact, and, finally, as the full weight is brought upon the leg contact is completed by the inner portion. The foot in supporting the weight of the body receives the thrust of the tibia and fibula or lower leg-bones upon the astragalus, with which they articulate at a point somewhat at one side of the central axis of the foot, this falling over the forward and inner portion of the heel. These relations result in what may be termed the "primary" weight-supporting contact of the heel in walking taking place upon the outer and principally upon the forward portion, whereupon the natural movement in continuing the step, or as it would be effected in absence of a more or less rigid soled covering, causes the foot to rock inwardly until at the completion of the step the pressure is upon the inner portion of the heel, furnishing the secondary and final weight-support. The foot should receive firm support at this point of final contact to prevent it from rocking too far inward, which tends to cause not only an undue approach of the inner condyle of the tibia, but also to break down the arch of the foot-bones, of which the astragalus is the keystone, producing directly the deformities known as "flat-feet" and "knock-ankles," and also, but more indirectly, "knock-knees." At the same time the outward yield should be permitted to simulate the conditions of nature, separate the ankle-bones, and remove undue strain from the arch of the foot. In the rubber heels often used upon shoes the proper support in the line of thrust of the leg-bones is lacking, the ankles are forced toward one another, and the arch strained. The drag or excessive friction of the rear edge of elastic heels upon dry and their slipperiness on wet surfaces is also objectionable. In the leather heel having a plane surface, as is the case when it is unworn, the inner support is present, but the outward yield of the foot is prevented until the outer portion is worn away. The heel then becomes unsightly and must be repaired, again throwing an unnatural strain upon the foot and tending to bring the ankles into an improper position. In the compound heels having rubber inserts at the rear portion the difficulties of both the above types are encountered, since the yield at the only point which can produce correct orthopedic results is lacking, while the drag and slipperiness remain. To obviate these objections and to not merely allow but to compel the foot to assume a proper position in walking are the principal objects of my invention.

In the accompanying drawings, Figure 1 is a bottom plan view of a shoe provided with a heel exemplifying one form of my invention. Fig. 2 is a rear elevation thereof. Fig. 3 is a transverse section on the line 3 3 of Fig. 1, and Fig. 4 is a bottom plan view of a heel embodying another form of my invention.

Similar characters indicate like parts throughout the several figures of the drawings.

The character S designates a shoe, the heel H of which is made in accordance with my invention. This, as here illustrated, comprises a body portion 10, made up of the usual lifts of sole-leather or other comparatively firm unyielding material. In the portion of this heel toward the outer side of the foot is formed by cutting away a part of one or more lifts a recess having an inner wall or shoulder 11, shown as dividing the heel longitudinally along its center. Filling this recess and secured therein in any desired manner, as by cement, nails, or both, is a plate 12 of some such comparatively yieldable material, as rubber, chrome-tanned leather, or felt, abutting against and supported by the shoulder and extending to the outside of the heel.

It will be seen that while my improved heel

is symmetrical in form, presenting the contour of the ordinary unworn shoe-heel, it has not the disadvantages hereinbefore enumerated, but instead yields at the outer portion, permitting a separation of the ankles and a resultant position of the foot closely approximating natural conditions or those existing in unshod feet, while at the same time it furnishes a firm support for the arch of the foot and prevents the approach of the ankles of the wearer by the non-yieldable inner portion. Moreover, though this is of secondary importance, the cushioning of the heel at its point of initial contact with the ground is secured and much of the slip of the ordinary rubber heel done away with by the presenting of a compound surface, these advantages being secured by the use of yieldable material having only one-half the contact-surface of the ordinary elastic heel, greatly increasing the economy.

In Fig. 4 is illustrated another form of my invention. Here the shoulder 13 of the recess instead of extending longitudinally of the heel lies diagonally thereto, giving the contracting or tread surface of yieldable material 14 only where it is most necessary or at the outer forward portion of the heel, so that when the weight of the body is upon the leg the foot will be caused to rock outward and relieve the strain upon the arch.

From the above it will be seen that my invention more essentially consists in the provision of a comparatively non-yieldable support at the inner forward portion of the heel and a yieldable support beneath the outer forward portion thereof and that the exact proportioning of these parts may vary according to the exigencies of the particular case in hand and still be within the spirit of my invention.

While the invention has only been illustrated in connection with block-heels, it will be evident that it is equally applicable to the spring-heels often used upon children's shoes, the proper portion of the outer layers being removed and replaced by the yieldable plate in exactly the same manner.

Having thus described my invention, I claim—

1. A heel comprising a body portion of comparatively non-yieldable material having a contact or tread surface which includes the inner forward portion thereof and provided with a yieldable section at the outer forward portion.

2. A heel comprising a body portion of comparatively non-yieldable material having a contact or tread surface which includes both the rear and inner forward portions thereof and provided with a yieldable section at the outer forward portion.

3. A heel comprising a body portion of comparatively non-yieldable material having a contact or tread surface which includes the inner forward portion thereof and provided with a yieldable section extending along the entire outer side.

4. A heel comprising a body portion of leather having a contact or tread surface along the inner side and extending to the rear portion, and a rubber cushion located at the outer forward portion.

5. A heel comprising a body portion of leather having a contact or tread surface along the inner side and extending to the rear portion, and a rubber cushion extending along the entire outer side.

Signed by me at Boston, Massachusetts, this 6th day of June, 1902.

LEWIS F. SMALL.

Witnesses:
WALTER E. LOMBARD,
SYLVANUS H. COBB.