Nov. 6, 1951 V. PELANT 2,574,056

TEST INSERTION FOR THE CHECKING OF THE CORRECT SHAPE OF THE INNER AND OUTER TREADING AREA OF FOOTWEAR

Filed June 25, 1947 2 SHEETS—SHEET 1

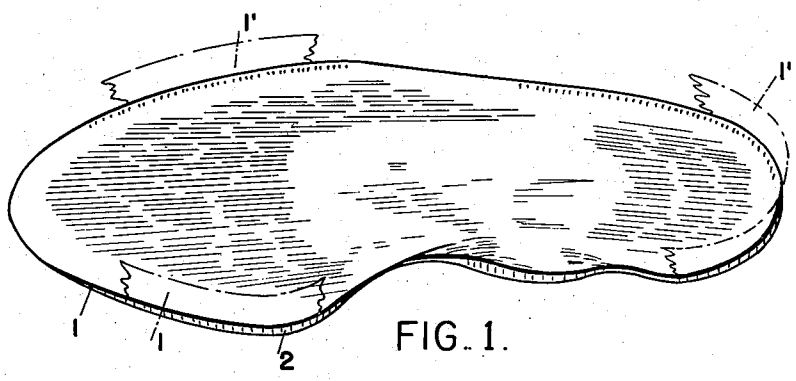


FIG. 1.

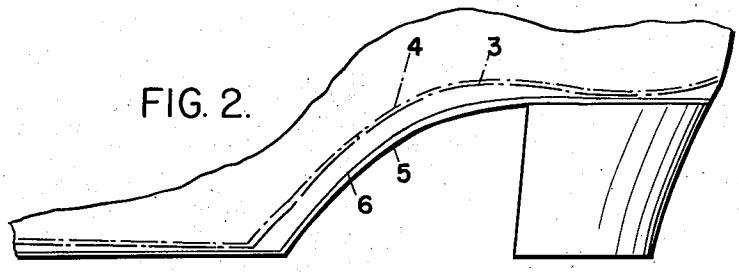


FIG. 2.

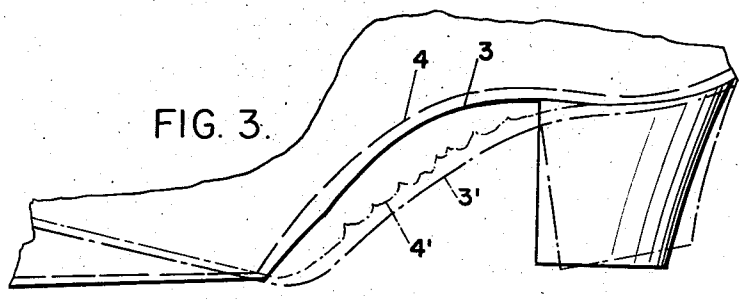


FIG. 3.

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FIG. 4

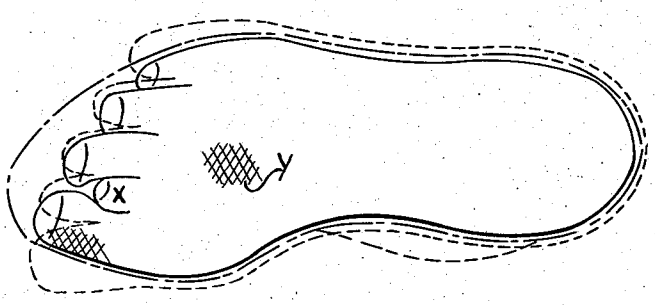


FIG. 5

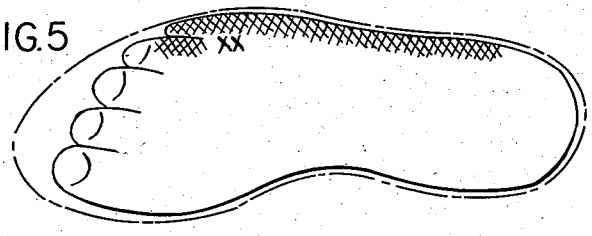


FIG. 7

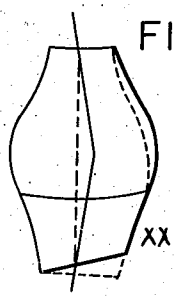


FIG. 6

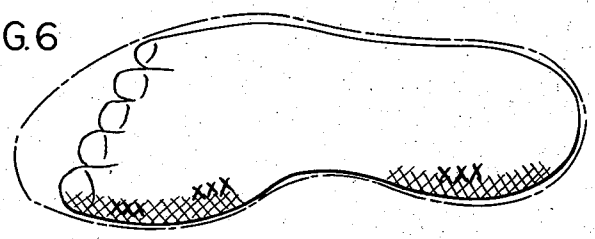
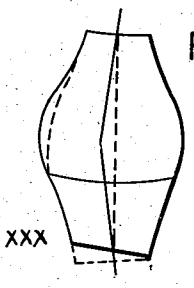


FIG. 8



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TEST INSERTION FOR THE CHECKING OF THE CORRECT SHAPE OF THE INNER AND OUTER TREADING AREA OF FOOTWEAR

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4 Claims. (Cl. 128—2)

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In the production of footwear it is customary to first make an imprint in a temporarily plastic material, for example gypsum (plaster of Paris), subsequently harden the mass and, in accordance with said mass, finally make the inner tread area of the footwear or plastic shoe lasts from which the inner tread area of the shoe itself can be determined. Alternatively, a sheet of a thin material, for example paper or cellulose (which has been impregnated with an appropriate chemical preparation) is put into a tentatively prepared shoe, and the person for whom the shoe is intended treads on the test insertion which is in the shoe or lies free. In neither of these methods does the foot assume, during the production of the imprint, the same position as when walking normally, so that the imprints are practically valueless. Another point to be considered is that a person who wears incorrect or defective footwear (for example with worn out heels) or who suffers from a diseased foot (corns, etc.) gives self-assistance when walking by various distortions of the foot and by shifting the weight of the body from the heel to the toe of the sole in an irregular manner which cannot be ascertained in any case by an imprint of a foot which remains stationary or is tentatively trodden on several times only.

The use of sheet insertions hitherto in shoes for such test purposes did not produce the desired result for the reason that such an insertion was distorted and partly shifted inside the shoe so that the shaded colouring of the insertion did not correspond to the real stresses of the foot in the shoe.

The object of the present invention is the elimination of these drawbacks which is attained by the use of a test insertion which is produced accurately in accordance with the shape of the inner treading area, and corresponds accurately to the position from which this test insertion can neither shift nor warp, the person concerned being able to walk about with this test insertion quite normally for a long period. According to the shaded pressure spots, the inner or even the outer treading area of the shoe is then adjusted and the person wearing the shoe uses a new, corresponding test insertion in order to check the correctness of these adjustments.

The test insertion according to the invention is conveniently made of one or several layers of sheets of paper, cellulose, etc., and their shape is produced in accordance with a shoe last from which the inner treading area was previously

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prepared, or in accordance with the adjusted inner surface.

In the accompanying drawing one particular embodiment of the invention is shown diagrammatically.

Figure 1 is a view of the test insertion according to the invention seen from above and partly from the side;

Figure 2 is a longitudinal section through an orthopedic shoe insert and through an ordinary footwear with a test insertion according to the invention;

Figure 3 is an analogous section through the footwear with the insertion and a sunken or collapsed portion of the foot arch;

Figure 4 is a view from below on the sole, the toes being shown squeezed together into a narrower shoe;

Figures 5 and 6 are two further views from below on the foot sole in a shoe the heel of which has become worn on the outside or inside according to Figures 7 and 8, respectively.

The test insertion according to Figure 1 consists of a sheet of a paper, cellulose or the like impregnated with an appropriate chemical preparation as for example litmus. In the embodiment represented, this insertion consists of two layers 1 and 2 superimposed and glued together, the test insertion corresponding completely to the inner treading area of the shoe; it may, however, be bent upwards at 1' of the circumference in order to allow the imprint of a callosity at the little toe or the joint of the big toe or at the heel to be made.

With such foot diseases, the person wearing the footwear shifts the weight of the body in an irregular manner to the area of the sole so that the outer treading area of the shoe (with concurrent wearing off of the heel) does not even correspond to this irregular way of treading. However, when the foot is deformed inside the shoe, for example by partial squeezing of one toe under the others, or by lowering the foot arch, such an irregularity is made visible on the insertion as shown by irregularly shaded areas, in accordance with which the inner treading surface of the shoe can be adjusted either by the removal, or by the addition of, material (for example by sticking-in appropriately cut pieces of material or by putting-in insertions of the usual kind).

Figure 2 shows a longitudinal section of the shoe, on the one hand with an orthopedic insert having an inner treading area 3 and a corresponding test insertion 4 and, on the other

hand, with an ordinary inner treading area or inner-sole 5 and the corresponding test insertion 6. In both cases it can be seen that the test insertion always conforms accurately with and contacts the inner treading area of the shoe insert or the inner-sole of the shoe.

Figure 3 represents an example of the giving-way of the inner treading area 3, with the test insertion 4 in the arch portion, into the position 3', 4'; it is clear therefrom that the test insertion has been wrinkled due to the shortening of the arch and thereby indicates also the degree of the sinking of the arch, which proves that the shoe insert does not, even in its basic construction, comply with the requirements. In such cases the basic construction has first to be made appropriate, and only thereafter can the inner treading area be adjusted on the basis of a further test insertion.

Figure 4 is an example of an incorrectly supported foot sole in a narrow shoe: the toes are squeezed together in such a manner that one of them at the point X is partly covered by the adjacent toes and partly distorted; moreover, the foot sole is overloaded at the point Y, which is in the region of the crests of the metatarsal bones. These two areas then imprint themselves on the shaded image of the test insertion.

Another example is shown in Figures 5 and 7 where, due to a heel worn out at the point XX (Figure 7) on the outer side, the foot sole is overstressed at the point XX of the little toe, which is moverover squeezed laterally.

Figures 6 and 8 represent an uneven loading of the foot sole with a heel worn out at the inside at the spot XXX (Figure 8); to this spot correspond three points XXX of the foot sole which likewise become visible by shaded spots on the test insertion. If the heel is worn out for example at XX (Figures 7), the person concerned will shift his body weight from the painful regions in a transverse direction to XXX (Figure 6).

From the above description it will be clear that by the test insertion according to the invention the deficiencies of the methods hitherto practised and of the means applied are not only eliminated but that moreover numerous advantages are attained which are summed up in the following points:

(*a*) One can check not only the inner treading area of the shoe proper but also the treading area of various orthopedic insertions when walking and can adjust these areas accordingly until they are perfectly adapted to the foot, and the foot can gradually be improved and cured.

(*b*) One can check also the outer treading area of the shoe, particularly the position of the foot and the height of the heel in order to comply as far as possible with the build of the foot.

(*c*) Moreover a general checking of new, used or worn-out shoes is made possible, thus to ascertain whether they still suit the foot in the course of prolonged wear.

(*d*) The manner of walking and the shifting of the loading of the foot when walking can be checked.

(*e*) For neglected sunken arches a gradual elimination of the disease and a relief of painful regions of the foot is made possible.

(*f*) It is possible to discover foot diseases which had lasted for many years, which had existed since childhood or even since birth, such as overstretched sinews, knock-knees or bow-legs, pointed feet, as well as feet with various diseases which have suffered due to incorrect treading

with unsuitable footwear (for example caused by wearing footwear obliquely worn out, after they were discarded by elder brothers or sisters).

(*g*) A considerable number of test insertions with check imprints can be used in succession for a shorter or a prolonged period until the fault is completely eliminated.

The lower layer 2 of the test insertion is made of a thin but rigid material which does not wrinkle, does not shift and does not get squashed whereas the upper layer 1 is conveniently made, according to Figure 2, from a sheet of plastic properties which admits the formation of perfect imprints of all and any excessive pressures acting on the foot sole. The whole insertion is, however, relatively thin, approximately 1 to 2 mm. (.04" to .08").

The test insertion can be equipped with a central reinforcement layer on both sides, if desired, having impregnated pressure areas, in order to make the checking of the points of treading more conspicuous and more perfect.

What I claim and desire to secure by Letters Patent is:

1. The method of fitting footwear, which includes the steps of inserting into the footwear to be fitted a test insert accurately fitting the inner tread area of said footwear so as to conform to the shape of the inner-sole of said footwear while said insert is being secured against shifting, said test insert being impregnated with a chemical adapted in response to pressure exerted upon said insert to show pressure spots on said insert, placing the footwear thus conditioned on the foot of the person to be fitted, causing the foot to be fitted, while the foot is moving and resting on said insert, to produce an imprint on said insert, thereupon removing the test insert from the footwear, and correcting the said inner tread area in conformity with the pressure spots on said test insert.

2. A test insert for checking the treading areas of a misformed foot while walking in a shoe, which consists of a fibrous sheet adapted to be inserted into said shoe and shaped according to the form of a last corresponding to the exact shape of the inner sole of said shoe, said sheet being impregnated with a chemical adapted in response to pressure exerted upon said insert while said foot is walking in said shoe with said insert therein to provide permanent shaded-off imprints of the pressure points of the foot sole.

3. A test insert for checking the treading areas of a misformed foot while walking in a shoe, which comprises a multi-layer sheet shaped according to the form of a last corresponding to the exact shape of the inner sole of said shoe, said sheet having a lower rigid layer adapted to withstand folding and wrinkling and correctly fitting the inner sole of said shoe so as to prevent sliding of said insert in said shoe when said insert is inserted thereinto, said multi-layer sheet also comprising an upper yielding layer impregnated with a chemical adapted in response to pressure exerted upon said layer while the foot is walking on said insert when inserted into said shoe, to produce permanent pressure spots upon said upper layer.

4. A test insert for the checking of the correct shape of the inner and outer tread areas of footwear and orthopedic shoe insertions, which comprises a multi-layer fibrous sheet having a reinforced middle layer, and a top and bottom layer impregnated with a chemical adapted in response to pressure exerted upon said upper and lower

layers to produce pressure points thereon, said multi-layer being shaped in conformity with the shape of the inner tread area and being of such size as not to shift upon the tread area of the footwear to be fitted.

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