Jan. 25, 1955 H. A. BEYER 2,700,230

LAMINATED FOOT ELEVATOR FOR SHOES

Filed July 30, 1951

Fig. 1.

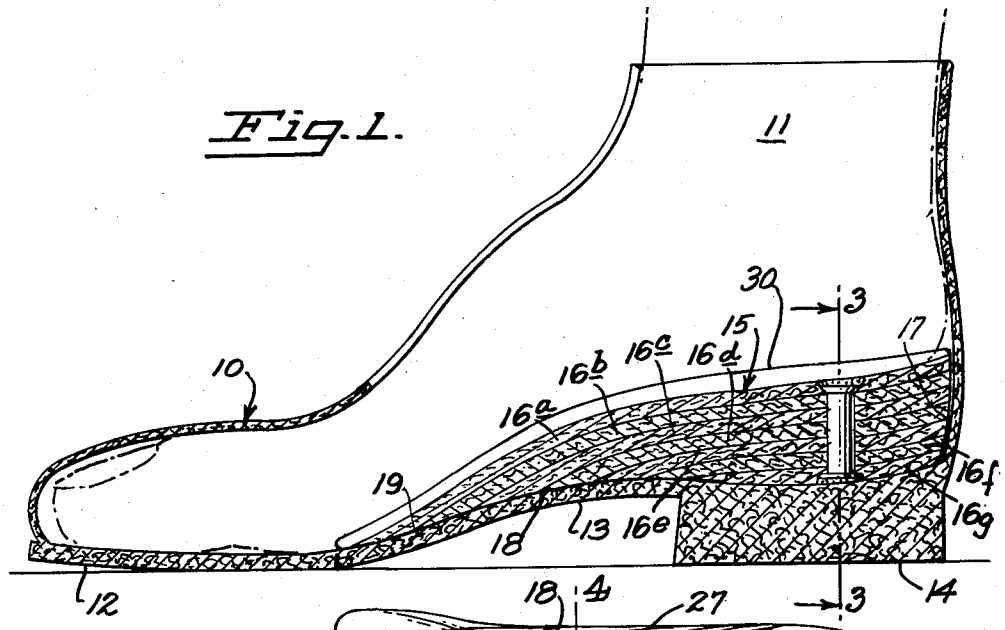
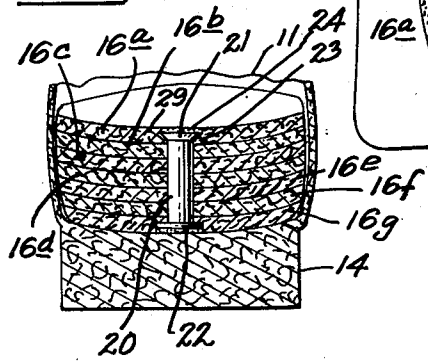


Fig. 3.



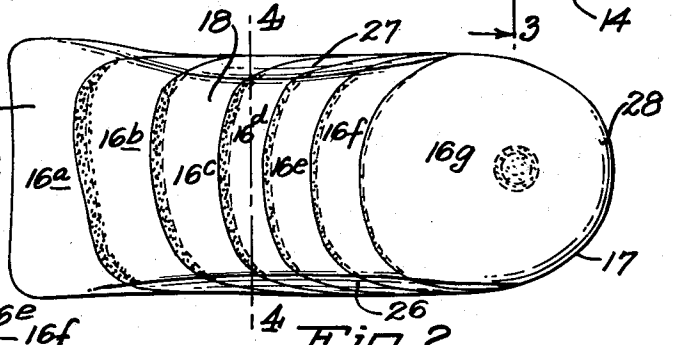


Fig. 2.

Fig. 5.

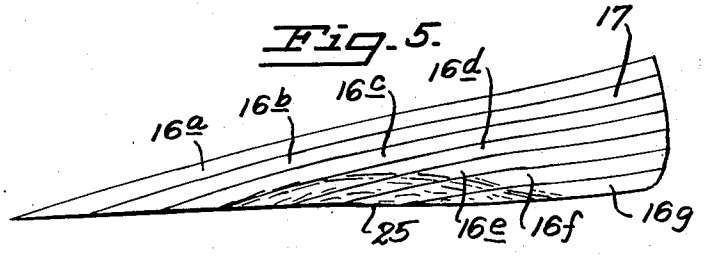
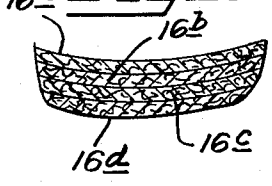


Fig. 4.



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2,700,230

Patented Jan. 25, 1955

2,700,230

LAMINATED FOOT ELEVATOR FOR SHOES

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Application July 30, 1951, Serial No. 239,319

2 Claims. (Cl. 36—71)

This invention relates to elevators for the human foot in shoes, and more particularly relates to such devices which provide a plurality of superposed laminated layers or laminae relatively fixed at a heel end portion and having sliding relation for the remainder of the length thereof.

The invention may be briefly described as comprising an elevating device for the human foot within the shoe, the device having a plurality of superposed layers or laminae of flexible material, such as leather, in which the superposed layers collectively are of greatest height at the heel portion and the layers being graduated in length from shortest layers at the bottom or sole to longest layers at the top whereby the elevator gradually decreases in height and increases in flexibility from its heel portion to its opposite end. The layers are fixedly secured relatively at the heel portion and are free for relative sliding movement in superficial contact from the heel portion to the opposite forward ends of the layers, so that the layers may flex and slide relatively by the bending of a foot within a shoe. At the forward ends the layers are cut transversely on a bias to the plane thereof so that they taper to substantially sharp relatively imbricated edges, and the tapered exposed faces of the layers collectively provide a bottom sole face of the elevator device.

An object of the invention is to provide an elevator for fitting within a shoe for the human foot which will elevate the foot at the heel of the shoe where the sole and heel of the shoe are rigid and which tapers in height gradually to the opposite end at the ball of the foot in the shoe and will provide a graduated flexibility from the heel portion towards its said opposite end at the position underlying the ball of the foot, whereby the sole of the shoe may flex normally underlying the ball of the foot between the toes and the arch.

One form in which the invention may be embodied is disclosed and described herein and illustrated in the accompanying drawing, in which:

Fig. 1 is a longitudinal vertical section of the elevator of the invention in its normal environment within a shoe, a foot within the shoe being shown in broken lines.

Fig. 2 is a bottom view of the elevator.

Fig. 3 is a transverse section on line 3—3 of Fig. 1.

Fig. 4 is a transverse section on line 4—4 of Fig. 2.

Fig. 5 is a side elevational view of the device of the invention at a formative stage before shaping to conform to the inner shape of a shoe in the manner shown in Figs. 1 and 2.

Referring to the drawing in which like reference characters indicate corresponding parts in the several views, **10** indicates generally a conventional shoe preferably of the so-called "high" type, in which there are a conventional flexible upper portion **11** which may extend a distance above the ankle of the wearer, a sole **12**, a shank **13**, and a heel **14**. In making shoes it is uniform practice to form the inner face of the heel slightly concave to conform to the rounded bottom face of the human heel of the wearer, the concavity being both longitudinal as shown in Fig. 1 and transverse as shown in Fig. 3.

The foot elevator device of the invention is generally indicated **15** and comprises a plurality of superposed layers or laminae of flexible material, such as leather, indicated **16***a, b, c, d, e, f,* and *g,* preferably of substantially uniform thickness and in superficial planar contact. The superposed layers collectively provide a

rearward heel portion **17**, a central shank portion **18**, and a forward ball portion **19**. The layers are of substantially the same maximum transverse width but graduate in length, the bottom layer **16***g* being the shortest longitudinally of the elevator, the uppermost layer **16***a* being the longest, with intermediate layers **16***b, c, d, e,* and *f* being graduated in length therebetween, whereby the thickness of the elevator is decreased from the heel portion **17** through the shank portion **18** and to the ball portion **19**. The length of the layers is not necessarily graduated evenly in the same ratio when the elevator is conformed to a shoe as in Fig. 1, since it is preferred that the upper layers **16***a, b* and *c* shall, when in the formed elevator, have greater length of exposed bottom area than the intermediate layers **16***d, e,* and *f,* as shown in Fig. 2.

At the heel portion **17** the superposed layers are fixedly secured together by any suitable binding means, such as bolt **20** centrally therethrough. The head **21** and the nut **22** of the bolt are countersunk into the respective top and bottom layers, preferably sufficiently to provide recesses **23** of minor depth which may be filled with any suitable material such as a hard drying plastic **24** to disguise the bolt and fill the recesses **21** flush with the outer planar face of the respective layers **16***a* and **16***g* into which the head and nut of the bolt are embedded. Throughout the remainder of their length the layers are free of fixed connection whereby they may flex relatively in superficial planar contact, the flexibility increasing in gradations from the heel portion proportionate to the decrease of collective thickness of the assembled layers in the elevator. At the free ends each layer is cut transversely on a tapered bias from the bottom face to the upper face, as best shown at **25** in Fig. 5, so that the terminal free end of each layer is feathered to a relatively sharp edge, the end portions being imbricated at the anterior ends, so that upon bending of the shoe and the consequent bending of the elevator the layers flex and slide upon one another as indicated by hidden stippling in Fig. 2. The major flexing is at the ball portion **19**, a minor flexing at the shank portion **18** and substantially no flexing at the heel portion **17**. Due to the tapered bias cut of the layers at the free end portion of the layers, the tapered face portions **25** of the layers, particularly at longitudinal center line of the elevator, are substantially straightly aligned in a plane and provide the bottom sole face of the elevator forwardly of the heel. But due to the construction in flexible layers from the sole face to the top, not only does the elevator flex with the bending of the foot in the shoe, but it also flexes to conform to the shape of the plane of the insole of the shoe, regardless of whether the insole be flat or arched at the shank of the shoe.

The bottom or heel layer **16***g* is of a length so that its forward edge terminates at the forward end of the concavity of the heel portion of a shoe. Heel layer **16***g* is tapered to a thin edge at its forward end and is relatively thicker at its rearward portion whereby its upper planar face provides an angular incline from the bottom or sole of the elevator to the securing post **20**, and the superposed layers **16***a* to **16***f* conform in general to this angle of incline, the angularity of which is somewhat less than 90 degrees relative to the post **20** and approximately 80 degrees is efficient.

As is well known, shoes which have an elevated heel are constructed with a shank **13** providing an incline in the plane of the shank of the shoe sole between the breast of the heel and the ball of the shoe, and when the elevator of the present construction is conformed to the sole of the shoe, the shorter layers **16***d,* **16***e* and **16***f* adjacent the bottom of the elevator terminate at that portion of the shank **13** of the more nearly adjacent breast of the heel where there is very little, if any, incline to the shoe sole, whereas the longer upper layers **16***a,* **16***b* and **16***c* terminate forwardly at the ball portion **19** of the elevator which overlies the ball portion of the shoe which blends into the incline of the shank which is where the greatest portion of flexibility is required. This provides a differential in aggregate thickness of the elevator and flexibility thereof, which is manifested in the greater length of the exposed bottom

or sole face portion of the several upper layers **16***a*, **16***b* and **16***c*, as compared with exposed sole face portions of the layers **16***d*, **16***e* and **16***f* adjacent the bottom of the elevator whereby stiff firm support by all layers **16***a* to **16***f* is provided for the elevator at the heel and that portion of the shank adjacent the breast of the heel where there is relatively little bending, and provides a maximum amount of flexibility at the ball of the elevator where the foot bends and the exposed sole faces of the superposed layers are longer and the number of overlying layers is decreased.

The shaping of the elevator to conform to the shape of the interior and inner sole of the shoe where the sides and counter of the shoe joins the welt is facilitated by removing longitudinal portions of the side edge material at each side of the lower layers, as at **26** and **27**, (see Fig. 2) and at the heel as at **28** (see Fig. 5). Such portions may be removed by grinding with any suitable grinding means well known in this art.

Since human feet are of differing shapes, some amount of adjustment will be made in contour of the elevator merely by the constant pressure of the foot on the device within the shoe of the wearer, though by tightly and fixedly securing the laminae or layers together at the heel by bolt **20** they are compressed and tightly secured at the central portion of the heel and thus provide a preformed heel depression **29** to accommodate the contour of the foot underlying the heel bone. By constant wear of the elevator within a shoe, the heat and moisture of the foot will soften the leather to a degree whereby the peripheral portions of the layers are formed slightly upwardly around the central portion to form an upraised peripheral rim **3***a* to more comfortably conform to the shoe.

It is to be understood, however, that if desired, the upper face of the elevator upon which the foot rests may be manually or mechanically preformed with an elongated depression therein.

Having thus described the invention, what is claimed as new and patentable is:

1. A laminated foot elevator for shoes said elevator having a length to include a rearward heel portion, a central shank portion and a forward ball portion, and said elevator comprising a plurality of superposed layers of flexible material, a binding bolt centrally of the rearward heel portion of the superposed layers and passing through each of said layers, said layers being relatively free for sliding relatively in superficial planar contact from said binding bolt to the opposite forward end portion, said layers being inclined at an angle to the binding post therethrough, the superposed layers being graduated in length from the bottom layer to top layer, the shortest layer being at the heel and sole of the elevator, the forward free end portions of the layers being tapered to a thin edge, whereby the exposed faces of the graduated length of the layers provide a sole face for the elevator, said shortest sole layers at the heel being of a length substantially equal to the length of the heel of a shoe and being tapered from its rear heel terminal end towards its opposite forward end and terminating at its forward end in a relatively thin edge whereby its upper face is inclined relative to the binding post and thereby establishing an angle of incline of the superposed layers, the angle of incline and the relatively short lengths of those layers adjacent the bottom heel layer providing the sole face of the shank portion of the elevator for contacting the shank of the shoe forwardly of the breast of the heel, and said angle of incline and the relatively longer lengths of the upper layer and those layers adjacent thereto providing for sole faces contacting the ball of the shoe where the ball of the shoe blends into the incline of the shoe shank, whereby a substantially rigid support is provided at the bolted heel portion, a stiff support is provided at the ball portion.

2. A foot elevator device for placing within a shoe, and having the elements of claim 1, the layers thereof being of substantially equal thickness throughout that portion of the length thereof which is removed from the taper forming the sole face portion of the respective layers.

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