Aug. 15, 1950 K. S. TYDINGS ET AL 2,518,649

FOOTWEAR WITH SLANTING SOLE

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Fig. 3.

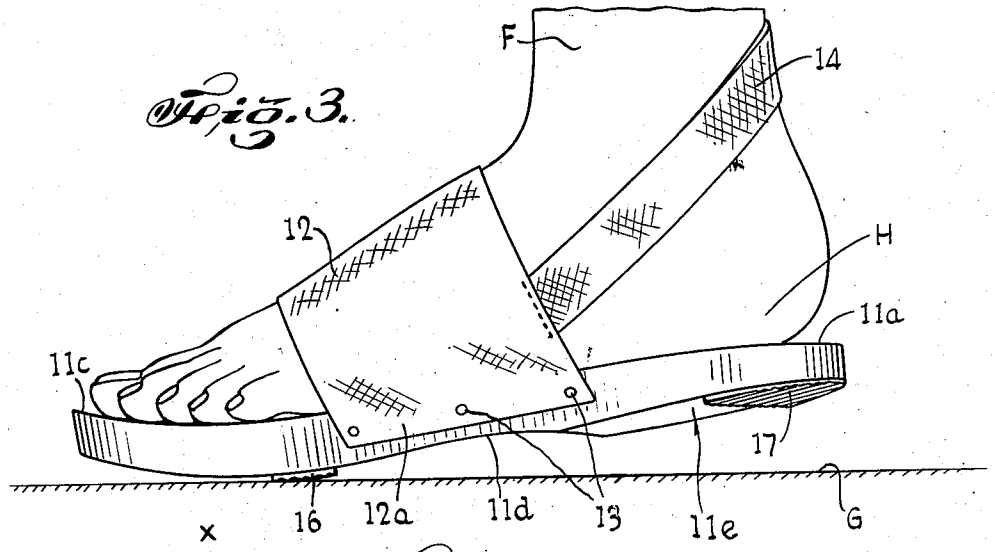


Fig. 2.

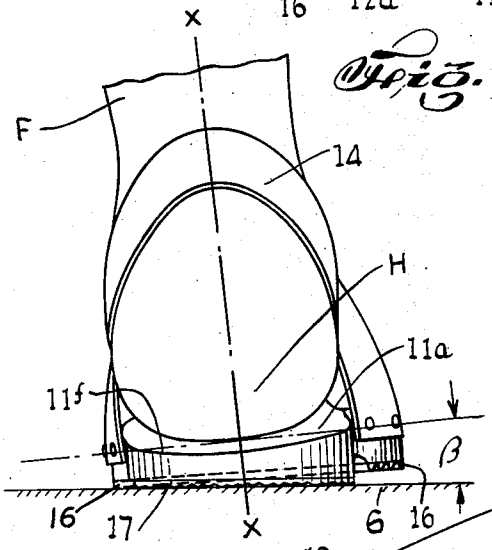
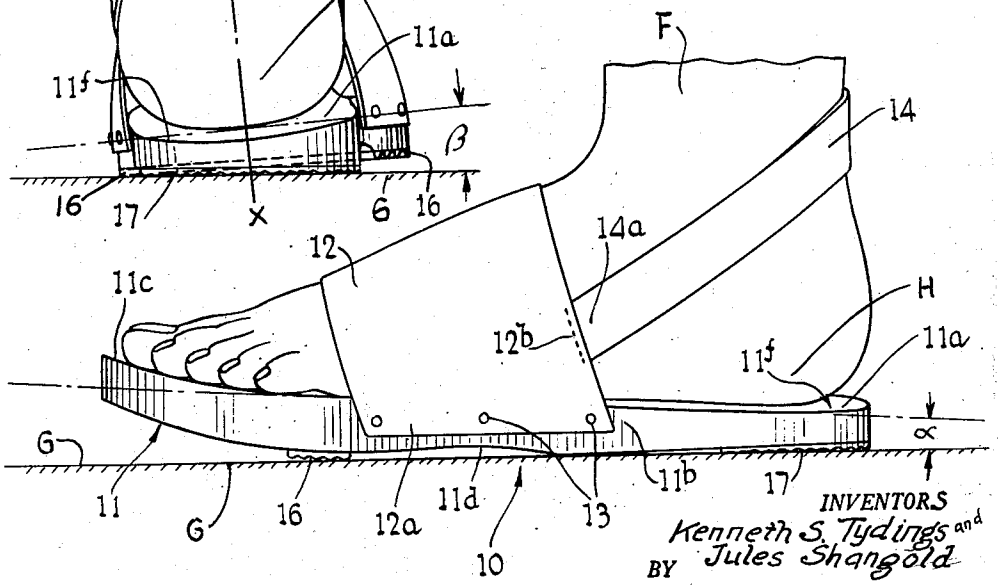


Fig. 1.



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Fig. 5.

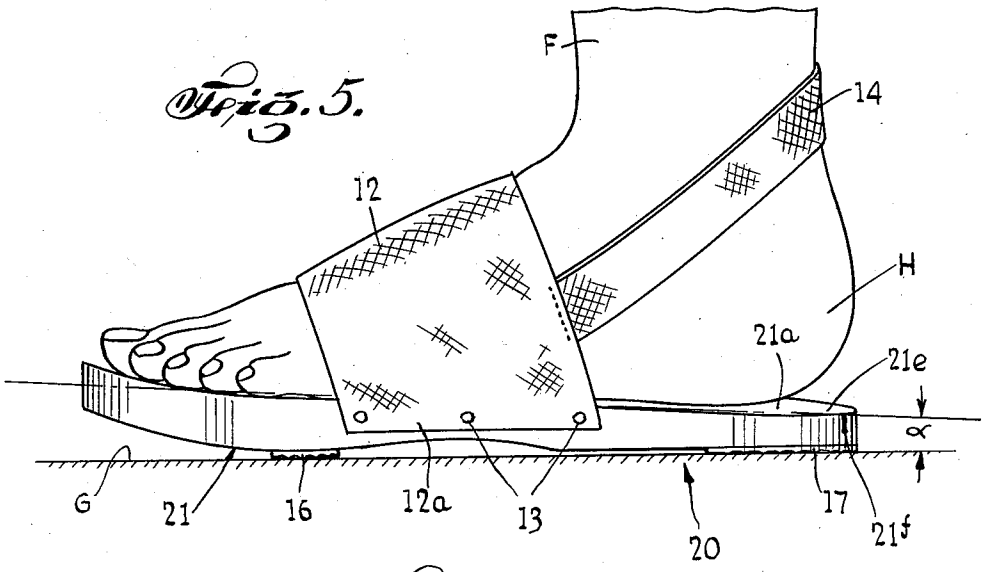


Fig. 4.

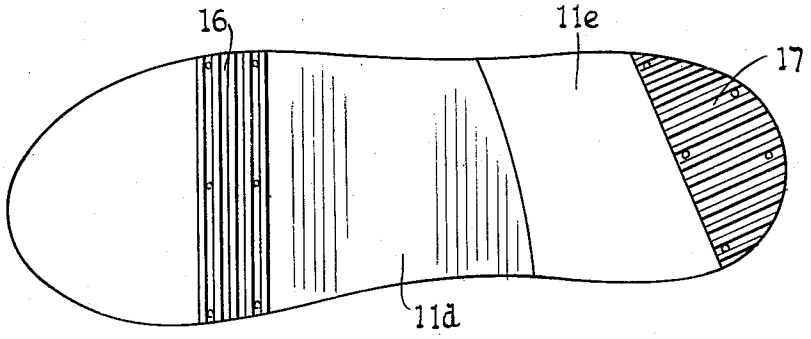
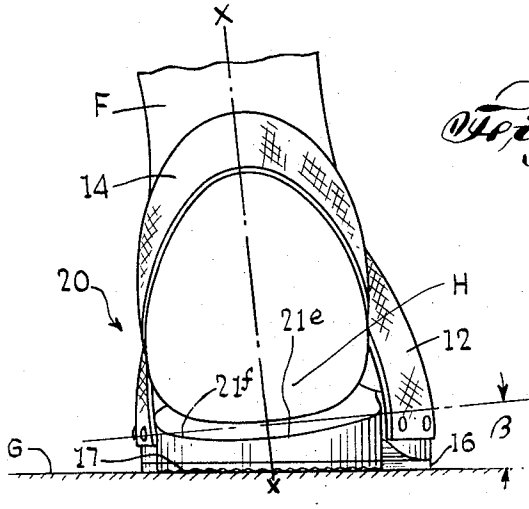


Fig. 6.



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FOOTWEAR WITH SLANTING SOLE

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Application February 27, 1947, Serial No. 731,366

3 Claims. (Cl. 36—8.5)

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This invention relates to devices for controlling the movement of foot and leg muscles and joints, and more particularly is directed to exercising clogs of simplified improved construction which help modify the tread of step movements of the foot to correct the ill-effects of improper walking or badly fitted shoes resulting in the shortening of the posterior leg muscles of the feet which may be conducive to forming a so-called "flat feet" condition as when high heeled shoes are extensively used, and to an improved method of performing exercises for lengthening the posterior leg muscles to alleviate said foot and other ills.

Among the objects of the invention is to generally improve devices of the character described and the method for exercising the foot, which shall comprise few and simple parts that are practically undistinguishable from some types of ordinary footwear in appearance and otherwise usable as such footwear but as so constructed and having the parts so arranged to give predetermined exercises while walking, which shall be cheap to manufacture yet readily adapted to orthopedic foot requirements aforesaid, which shall function in a practical and efficient manner to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the constructions hereinafter described and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown one possible illustrative embodiment of this invention,

Fig. 1 is an outer side elevational view of an exercising clog fitted to sole and heel of a left foot and constructed to embody the invention, the position of the foot and clog being shown during walking or exercising with the weight of the body on the heel as initially applied thereto,

Fig. 2 is an end or heel view of said left foot and exercising clog shown in Fig. 1 with the weight of the user as initially applied to the heel and, therefore, tilted so that its lower or outer surface at the heel evenly bears on the ground and with the wear surface at the ball elevated from the ground at the inner edge.

Fig. 3 is a side elevational view like that shown in Fig. 1, shown during walking or exercising position after the weight of the body has been shifted from the heel to the ball of the foot,

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Fig. 4 is a bottom view of the improved clog, shown in Fig. 1,

Fig. 5 is an outer side elevational view like Fig. 1 showing an exercising clog for the left foot of modified construction with the weight as initially applied thereto, and

Fig. 6 is an end or heel view of the foot and clog shown in Fig. 5 also as with the weight as initially applied.

Heretofore many relatively complicated appliances have been devised and used for treatment of foot ills resulting from shortening of the foot and posterior leg muscles due generally to prolonged wearing of high-heeled shoes and also from badly fitted shoes tending or causing displacement of the bone joint arch and resulting in so-called flat feet. There also has been prescribed certain forms of foot exercises for such treatment of foot ills which may be taken with or without special devices.

The present invention provides exercising clogs of improved construction which in appearance resembles an ordinary type of footwear but which incorporates features to produce a predetermined treatment of the foot ills of the character described if worn at certain intervals during the day in the normal ambulation.

Referring in detail to the drawing, 10 denotes an exercising clog constructed to embody the invention shown in Fig. 1 as applied to the left foot F with the weight of the body (not shown) on the heel H. Said clog 10 may comprise a relatively rigid sole member 11 made of wood, leather, fibre, plastic compounds or other suitable cut or molded material having an upper or foot bearing surface 11*a* conforming to the size and contour of the bottom side of foot F which rests on said surface 11*a*, a flexible upper or cross band 12 extending to snugly fit over the instep portion of the foot F for releasably holding said sole member 11 in effective position, said band 12 having ends 12*a* thereof anchored to opposite side or edge surfaces 11*b* of said sole member 11 by suitable means such as, for example, nails 13, and a flexible elastic heel strap 14 having ends 14*a* secured to spaced portions of the rearwardly extended edge border 12*b* of said cross band 12.

The foot bearing or upper surface 11*a* of the sole member 11, as shown in Fig. 1, is disposed to lie, when the weight of the body is on the heel, substantially in a plane rearwardly inclined from the toe to the heel region at angle α with respect to a normal horizontal ground supporting plane, indicated at G. This angle for ordinary purposes may be approximately 15°. If de-

sired the leading or toe end 11c of sole member 11 may be made to tilt up slightly above said plane to comfortably accommodate the toe pressure forces of the foot F while walking.

An under or ground-bearing face 11d of the sole member 11, as shown in Figs. 1, 2, 3, and 4, is chamfered or bevelled off at the shank portion thereof transversely of said sole member 11 and out of a normal horizontal level with a slope from the inner side of the sole member 11 to the outer side thereof for demarcating a heel tread surface 11e, the greatest pitch of the top surface of which as at 11f is towards the extreme outer rim under and slightly beyond the heel H. When the weight is on the heel H the clog will be tilted so that the tread surface 11e will evenly bear on the ground G in a horizontal position, thereby throwing the vertical foot extension slightly out of a normal perpendicular position, as indicated by the dot and dash axis line x—x in Fig. 2, with respect to the ground support G. The amount of tilt found effective in use corresponds to making angle β between the plane of upper surface 11a and the tread surface 11e approximately 5°.

If desired spaced rubber strips may be provided as cushioning and anti-slipping means on said under surface 11d. Said strips as shown in Fig. 4 comprise a cross piece 16 extending under the ball portion of the foot F and a heel segment 17 which partially covers the tread surface 11e to its extreme outer edge.

The use of the invention will now be apparent. A matched pair of clogs 10, the right one (not shown) being made like the left one and supplied to form mates, in the well understood manner, are constructed as described above and shown in the drawing Figs. 1 to 4 inclusive. They may be readily slipped on the feet F by simply inserting each of the latter between the cross band upper 12 and sole member 11 and securing the clogs 10 against displacement by positioning the elastic heel strap 14. Said clogs 10 may then be worn about the house or outdoors without attracting special attention. In walking with said clogs 10 the weight of the body causes the leg and posterior muscles of the feet to be stretched when each heel H is first tilted outwardly, as shown in Fig. 2, and then is allowed to be released on raising the heel H when the weight is shifted to the balls of the feet F.

All movements of the foot and posterior leg muscles and the adjoining joints including those forming the arch take place in corrected sequence and degree without any attention given thereto by the wearer. Foot ills of the character described may thus be successfully treated without requiring any other voluntary movement as said predetermined foot exercises in wearing clogs 10 are attained merely by ordinary walking movements.

The improved method embodying the invention will also now be apparent.

In normal walking, the forward foot on contacting a ground support should first take the weight of the body on the outside of the rear heel H. As the foot movement continues the weight is shifted along the outer border region of the foot to the fifth metatarsal joint thereof. The inner border of the foot is then freed and is permitted to serve as portion of the arch to cushion the weight. The weight of the body is then taken up by the metatarsal region until the foot leaves the ground support. This cycle of movements is repeated for each foot in the well understood manner of walking and the foot and leg posterior muscles are kept in a sufficiently stretched condition without giving pain or uncomfortable feeling which usually accompanies foot ills.

In abnormal walking, such as prolonged wearing of high heeled shoes, which usually cause foot ills, the leg posterior muscles being retained in a foreshortened condition for long periods of time, cause the rear region of the heel H of the foot F to contact a ground support G with the heel H in an upwardly and outwardly pulled position so that the weight of the body is taken up in a line of motion toward the inner border of the foot rather than on the outer border as in normal walking described above. The effect of the foot arch serving to cushion the weight in this abnormal walking movement is thus greatly diminished, or may be entirely destroyed, which in a relatively short time develops foot trouble, such as indicated by a so-called flat feet condition.

In practicing the method of the invention and in using the improved clogs 10, on feet troubled with shortened leg posterior muscles, abnormal walking caused thereby is corrected by contacting the ground support G, or the equivalent means, to first take the weight of the body by rolling the foot F, as the shortened leg posterior muscles pull upward so that the inner border of the heel H slopes outwardly in a plane at an angle of at least 5°, while bringing the stance of the foot bottom to extend in a plane rearwardly inclined at an angle of approximately 15° from the toe to the heel H of the foot F, so that the outer metatarsal joint prevents eversion and rotation of the front heel bone joint. Next shifting the weight of the body along the outer border region of the foot to the metatarsal joint, and then taking the entire weight on said metatarsal region to prevent the heel H from twisting and thereby maintaining the arch effect of the foot structure to cushion the impact due to walking movements.

A modified construction of the invention in form of clog 20 is shown in Figs. 5 and 6, in which the sole member 21 of clog 20 is made like sole member 11 of clog 10 above described, the difference being in locating or positioning the chamfered or bevelled off heel-bearing surface 21e on the upper face of the clog with the slope running from the inner edge of the upper face 21a in the heel region downwardly in a continuous single direction to the outer edge thereof, with the thinnest portion of the clog at 21f towards the extreme outer rim, instead of providing the chamfer on the under or ground-bearing side of the clog as done for portion 11e of clog 10.

Like in the construction of clog 10 said heel-bearing surface 21e of clog 20 throws the vertical foot alignment, when the weight is on the heel, slightly out of a normal perpendicular position as indicated by a dot and dash line X—X in Fig. 6. Here also the amount of tilt found effective in use corresponds to making angle β between the plane of upper surface 21a and heel-bearing surface 21e to be approximately 5°. The angle α of foot-bearing or upper surface 21d of sole member 21 as shown in Fig. 5 may also lie substantially in a plane rearwardly inclined from toe to the heel region with respect to the normal ground supporting plane G at an angle of substantially 15°.

Clog 20 may also be provided with flexible upper or cross band 12 extending to snugly fit over

the instep portion of foot F and flexible elastic heel strap 14. Both band 12 and strap 14 are attached to sole member 21 in the same manner as described above for clog 10.

Strips in the form of cross piece 16 and heel segment 17 may also be provided as cushioning and anti-slipping means as shown in Figs. 5 and 6 and serve the same purpose as similar strips 16 and 17 of clog 10 described above.

The use and method of practicing the invention with clog 20 is the same as that already described for clogs 10, although the chamfered or bevelled face 21*a* of the heel-bearing surface 21*e* of clogs 20 is located and positioned on the upper rather than on the under side of the member 21.

It will thus be seen that there is provided clogs and method whereby the several objects of this invention are achieved and which are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. Exercising footwear of the character described comprising a sole member of rigid material adapted to be secured on the under side of a foot, said member having an upper bearing surface which generally in its entirety is inclined downwardly approximately 15° from the toe end to heel end thereof with respect to a horizontal supporting plane, the bottom or ground-bearing surface of said member diverging transversely relative to the upper bearing surface of said member in its heel region in a continuous single direction, this transverse divergence being no less than 5° from the outer to the inner border

of the heel region only, whereby when the ground bearing surface in the bottom of the heel end of the member rests on the horizontal supporting plane, the upper bearing surface at the heel end slopes transversely at an angle of no less than 5° with respect to the said plane so that walking with said footwear inclines and slopes the foot to stretch the posterior leg muscles for maintaining a normal arch effect therefor.

2. The exercising footwear of claim 1 wherein the bottom or ground bearing surface of said member in its heel region is chamfered off transversely to provide the transverse divergence in the heel region from the outer to the inner border of the heel region.

3. The exercising footwear of claim 1, wherein the upper bearing surface of the member in its heel region is bevelled off transversely to provide the transverse divergence in the heel region from the outer to the inner border of the heel region.

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