Dec. 27, 1938. E. STERN 2,141,699

FOOT ARCH SUPPORT

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Fig. 1.

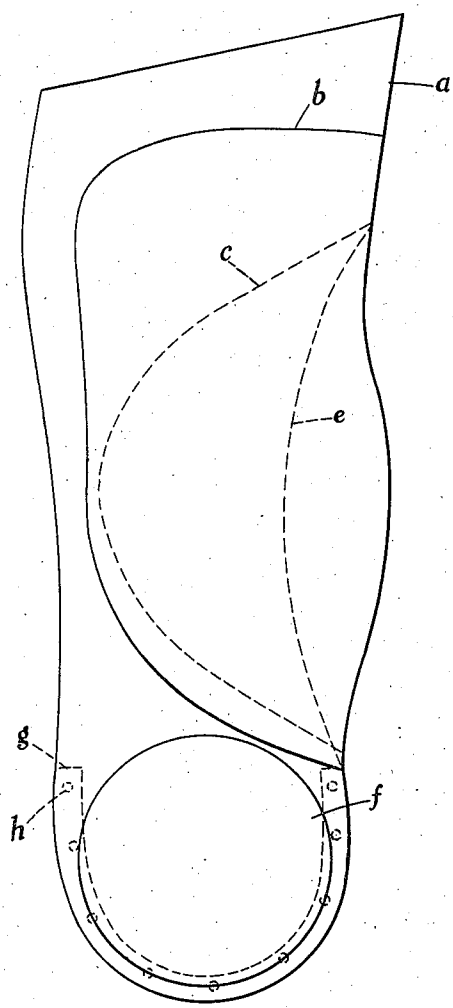
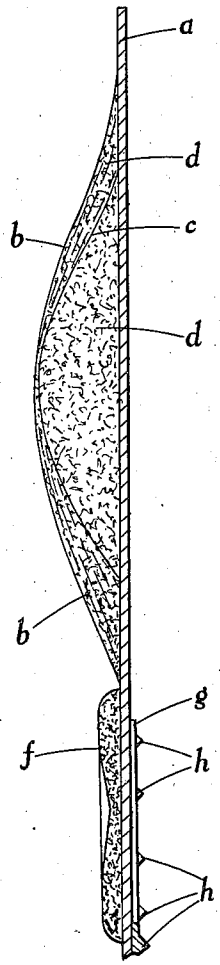


Fig. 2



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FOOT ARCH SUPPORT

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6 Claims. (Cl. 36—71)

The invention relates to a foot support for the purpose of removing the complaints of flat, sagging and weak-jointed feet, and continuously compensating the load on the foot.

In contradistinction to most of the hitherto usual foot supports, which have the tendency violently to lift or to overcorrect the fallen arch of the foot without, in this case, checking the cause of the sagging of the foot, the purpose of the foot support forming the object of the invention, which may be constructed as a sock or incorporated directly in the shoe or boot, is to compensate the disturbed statics of the whole leg—which is regarded as the most important cause of the sagging of the foot—both when standing and walking, and thus to check an incorrect loading of the foot; for, sagging of the foot is the result of the incorrectly loaded foot trying to adapt itself to the pressure, no longer centered, bearing thereon. The sagging is to be regarded, as it were, as a self-defence of the foot, which by spreading of the metatarsal bones with subsequent sagging, checks the incorrect distribution of weight.

The present foot support renders it possible by means of a particularly light non-hygroscopic material and a particular storage thereof by means of specially shaped and arranged bags, to obtain a continuous levelling-out of the whole leg. As non-hygroscopic material for filling the support or the bags mentioned, it is suitable to use, for instance, ground, specially treated, synthetic resin, for example, Bakelite, which is treated by heating it to 180° C. and grinding it after cooling.

The specially cut-out bags prevent the filling material from being thrown, on sudden shock-like vibrations of the support, to wrong points, from which it cannot be automatically brought to the correct point under the pressure of the foot. By the entire construction and arrangement of the support, the filling material, on the contrary, always remains under the arch of the foot and the metatarsal bone, where it is automatically distributed to the points most favourable at the time.

In this arrangement, which allows a permanent free play of the foot muscles, a real massage of the foot soles, takes place during walking. In this case, a strengthening of the foot-sole muscles is obtained, which results in a substantial improvement of the foot and prevents further sagging. Owing to the permanent movability of the filling material within prescribed limits, the whole leg is continuously levelled-out and an incorrect load is prevented, whereby further spreading and sagging are impossible.

The said bags containing a non-hygroscopic material may be fixed on a support, for instance, on a semi-stiff or stiff sole, and arranged in such a manner that an outer bag, which generally corresponds to the normal foot arch of the metatarsal treading surface, encloses a smaller bag corresponding only to the main arch. The middle third of the inner bag is, in this case, connected at its upper and lower side to the covering outer bag at the surfaces of contact.

The inner edge of the bags overlaps the inner concave edge of the sole in such a manner that, on its insertion in the shoe, it bears against the inner edge of the shoe to such an extent that it can rise up to the height of the arch. The semi-stiff or stiff sole, which may extend forwards in the shoe or may even be shortened, may consist, for instance, of cardboard, vulcanized fibre, leather or the like, while the bags are preferably made of linen, canvas, soft leather or the like.

Both bags are filled, as mentioned, with ground, suitably pre-treated synthetic resin, for example, Bakelite, but in such a quantity ratio that the filling mass can always shift during walking, so that the support is shaped of its own accord in each shoe. Thereby a good fit is always ensured even when changing into other shoes.

The whole, the sole and bags, is preferably covered with thin leather, in which case the main bag may be outwardly visibly defined by quilting.

In another form of construction, the semi-stiff or stiff sole may also lie within the main bag.

If the subject of the invention is constructed as a sock, which is very light and has a weight of about 40 grams, this sole, in order to prevent sliding in the shoe, is preferably provided at its heel end with a steel bow of horseshoe form carrying several small steel pins, which can easily be pressed into the shoe and in this manner always secure the foot support in the shoe. The steel bow is then preferably worked into the sock in such a manner that only the steel pins project at its underside.

In addition, a heel pad may also be provided for any existing heel spur, which pad may be filled with the same material as the bags.

The drawing illustrates a constructional example of the subject of the invention in the form of a sock.

Fig. 1 shows the sock in plan view.

Fig. 2 is a longitudinal section through the sock.

In the drawing, *a* is a semi-stiff or stiff sole, on

which a bag *b* is fixed, which corresponds in size to the size of the normal foot arch increased by the metatarsal treading surface. Worked into this bag and partly connected thereto, for instance, by sticking, sewing or otherwise, is a second bag *c*, which corresponds in size to the normal main arch of the foot. Both bags overlap with their inner edge the inner concave edge *e* of the sole *a*, and are loosely filled in accordance with requirements, with a light non-hygroscopic mass *d*, the nature of which permits a shifting of its particles under the pressure of the weight of the body during walking.

On the heel part of the sole *a* there is furthermore provided for any existing heel spur a heel pad *f*, which is preferably filled with the same mass as the supporting bags. The heel pad, however, may also be formed by a simple extension of the bag *b*.

A metal bow *g* of horeshoe form having spikes *h* is fixed underneath the sole *a* to its heel part in order to prevent sliding of the sock in the boot or shoe.

If required, however, more than two bags may also be employed. Beyond this, however, other forms of construction are also possible. Thus, for instance, the semi-stiff or stiff sole may be constructed in the form of a pocket and there may be introduced into and secured in this pocket, according to requirement, one or more bags in any desired arrangement, one above, within or behind the other.

Finally, the foot support could be formed, for instance, by filling a sole formed as a pocket, with filling mass, provisionally closing the pocket, inserting the sole in the shoe and allowing the patient to walk on it. The foot then shapes itself on the sole. By pressure exerted from outside, the mass in the pocket can now be shifted towards the inside of the arch. The freedom of movement of the mass may be restricted, for instance, by quilting. In this manner, the pocket may again contain one or more supporting bags, which act in the same manner as the above described bags *b* and/or *c*.

I claim:

1. A foot arch support comprising in combination with a sole, an outer bag covering the instep of said sole and corresponding in size to the normal foot arch increased by the metatarsal treading surface, a second bag within said outer bag and corresponding in size to the main arch of the foot, both said bags overlapping the inner concave edge of said instep, a loose filling in said bags of incoherent non-hygroscopic particles which are displaceable under pressure of the foot on the bags, and a heel pad on said sole, said heel pad including a filling of the same material as that of said bags.

2. A foot arch support comprising in combination with a sole, an outer bag covering the instep of said sole and corresponding in size to the normal foot arch increased by the metatarsal treading surface, a second bag within said outer bag and corresponding in size to the main arch of the foot, both said bags overlapping the inner concave edge of said instep, and a loose filling in said bags of incoherent non-hygroscopic particles which are displaceable under pressure of the foot on the bags, said sole comprising a sock, separate from an article of foot wear, having projections on the underside of its heel to prevent the sock slipping when in use.

3. A foot arch support comprising a mass of loose non-hygroscopic particles which are displaceable under pressure of the foot to distribute the mass automatically according to the prevailing load on the foot, said mass consisting of synthetic resinous material heated, cooled and then ground.

4. A foot arch support comprising a mass of loose non-hygroscopic particles which are displaceable under pressure of the foot to distribute the mass automatically according to the prevailing load on the foot, said mass consisting of Bakelite heated to 180° C., cooled and ground.

5. A foot arch support comprising a sole, a deformable padding covering at least the instep of said sole and overlapping the inner concave edge of said instep, said padding including a mass of loose non-hygroscopic particles which are displaceable under pressure of the foot to distribute the mass automatically according to the prevailing load on the foot, said mass consisting of synthetic resinous material heated, cooled and then ground.

6. A foot arch support comprising in combination with a sole, an outer bag covering the instep of said sole and corresponding in size to the normal foot arch increased by the metatarsal treading surface, a second bag within said outer bag and corresponding in size to the main arch of the foot, both said bags overlapping the inner concave edge of said instep, and a loose filling in said bags of incoherent non-hygroscopic particles which are displaceable under pressure of the foot on the bags, said filling consisting of synthetic resinous material heated, cooled and then ground.

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