APPLICATION VOID.

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PATENT SPECIFICATION

Convention Date (Germany): April 16, 1935. **476,323**

Application Date (in United Kingdom): March 2, 1936. *No. 6282/36.*

Specification not Accepted

COMPLETE SPECIFICATION

Method of Manufacturing Foot Arch Supports and Lasts for Shoes

We, LUDWIG RUCKERT, of 17, Kaiserstrasse, Würzburg, Germany, of German nationality, and AUGUST FÖRSTER, of 2, Daniel Sauer-Strasse, Würzburg, Germany, of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the method of manufacturing foot arch supports and lasts for shoes. It has been proposed to manufacture orthopedically correct foot arch supports by placing a plastic mass on the insole of the shoe of the patient, which mass is pressed into the correct form by the patient walking with the shoe containing the mass until the said mass has set. In this method it is essential that the set mass makes close contact with the whole surface of the foot. By the method heretofore proposed this is attained only in an unsatisfactory way, because the necessary amount of the mass cannot be determined beforehand.

We are aware that it has heretofore been proposed to make a model from a foot by placing the foot in a mould having a lining of a plastic mass, the mould being provided with holes through which the excess of the said mass may escape. As distinguished from this prior proposal foot arch supports or lasts for shoes are formed by the pressure of the foot on the plastic mass which is applied to a shoe, the excess of the plastic mass being expelled by the weight of the human body through holes made in the shoe.

The method of the present invention consists in filling the shoe with a large excess of the mass, and permitting the said mass while it is moulded by the patient to escape under the pressure of the foot and the weight of the body. For this purpose the shoe, for example the sole is formed with one or more holes. Preferably these holes are made so that they can be closed. The amount of the mass remaining in the shoe can be regulated by closing the holes when sufficient of the plastic mass has been expelled to leave an arch support of the desired thickness.

The arch support which is thus produced may be left within the shoe so that it provides therein an orthopedically correct sole. But it may also be removed from the shoe to be used as an arch support in any shoe of the patient.

Further the method may be used for making a last which exactly corresponds to the shoe, and from which the shoemaker may manufacture an orthopedically correct shoe. For this purpose the shoe which contains the orthopedically correct support is filled with a mass which is capable of hardening, and which does not combine with the support and the shoe. After setting the hardened mass is removed, and now it provides the correct last.

Further, by means of the method old lasts may be brought into the orthopedically correct form adapted to the foot of the patient. For this purpose to the arch support made in the manner described a coating capable of hardening is applied, and the support is rigidly pressed to the sole of the last to be corrected. After the coating has set the last is finished. The method may be carried out in such a way that the coating of hardening mass adheres with the last. The coating of hardening mass may, however, be subsequently fixed to the last.

In a corresponding way old foot supports may be improved by providing the same with a few holes, applying thereto a large excess of plastic mass, and placing the same into the shoe of the patient. By walking the patient presses the plastic mass into the correct shape, and the excess is expelled, so that finally an orthopedically correct arch support is obtained,

[*Price* 1/-]

This method is particularly suitable for enabling the physician, who has caused an arch support to be made on the basis of his examination of the position of the bones and the muscles, to make further corrections on the basis of the test of the support in practical use. When the support is coated in the manner described with a plastic mass and is pressed within the shoe of the patient into correct form, the mass is left at some parts of the support which require strengthening. In order that the excess of the mass may escape the support is provided with several holes.

By means of the support or the correct last exactly corresponding arch supports of metal may be manufactured by hammering the metal on the support or on the corrected last.

Finally the method enables the physician to observe the progress of the treatment of the foot. When, say several weeks after the manufacture of the arch support, a second support is made in the same way the physician may examine the development of the disease by comparing the two supports or two plastic castings made from these supports, and he may correct the form of the support on the last whereby healing is assisted in a suitable way.

The accompanying drawing illustrates the method. In said drawing

Fig. 1 is a vertical sectional elevation of the foot and shoe of the patient having a lining of plastic material shaped to form an arch support.

Fig. 2 is a plan view of Fig. 1,

Fig. 3 is a longitudinal sectional elevation of a shoe provided with the finished arch support and filled with plastic material which after hardening provides a last.

Fig. 4 is a longitudinal sectional elevation of a last having an arch support fixed thereto and containing an intermediate layer of plastic material for correcting the last, and

Fig. 5 shows the manner of improving an old arch support according to the new method.

The method of manufacturing an arch support for shoes is carried out as follows: The shoe *a* of the patient is provided with one or more holes *b* which preferably can be closed in a suitable way. The drawing shows a screw plug *c*. Internally the sole of the shoe contains a thick layer *d* of a suitable plastic, powdered or otherwise mouldable material which is capable of setting after some time. Preferably a mass is used which is plastic in a non-heated state and sets in the course of a few hours. A suitable plastic mass is a wood pulp material known by the trade name "stralith" which is capable of setting. For certain purposes, for example for splay foot the arch support may be made entirely or in part from powdered leather or the like, or from other flexible material. Now the patient puts on his shoe and at first walks therewith in the room. Thereby the plastic material is pressed into correct form by the weight of the body so that it is pressed into close contact with the whole sole of the foot and provides protuberances at such parts which must be supported. The excess of the plastic material gradually escapes through the hole or holes *b*. After the mass has been reduced to the correct amount the hole *b* may be closed. Now the patient follows his work, while he walks again and again for some time, thus holding the gradually setting mass in the correct shape.

The sole which has thus been made may be left in the shoe. It is held by the mass being formed passing into the holes made in the shoe and providing therein lugs. But it may also be taken out of the shoe to be used as an arch support in any shoe of the patient. In this case the lugs formed in the holes *b* are first removed to permit the support to be taken out. Should the physician desire that certain bones, muscles, or ligaments be not supported or only slightly supported the support may be corrected in different ways.

Fig. 3. shows the manufacture of a last. At first an orthopedically correct support *d* is formed within the shoe in the manner described above and it is now filled with a plastic mass *e* such as plaster of Paris which is adapted to set. After the mass has set it is taken out of the shoe. The last which has thus been made may be used in the manufacture of shoes. The shoe has the shape corresponding to the foot. Particularly the sole exactly corresponds to the othopedically correct support.

Fig. 4 shows the manner of correcting an old last according to the new method. To an orthopedically correct arch support *d* which has been previously made, and which is provided with a few holes *f*, plastic mass *h* is applied, and it is rigidly pressed on the sole of the last, for example by means of straps *g*. The excess of plastic material is expelled through the holes *f*. Now the set plastic mass *h* directly sticks to the last, or it is subsequently fixed thereto in a suitable way.

The method of correcting an old arch support by the new method is shown in Fig. 5. To the old arch support *i* a thick coating of plastic mass *j* is applied, and it is put into the shoe. The support *i* has

several holes *k*. Now the patient puts on the shoe and he walks therewith several hours, so that before hardening the plastic mass is pressed on the support *i* into the correct shape. The excess of the mass escapes through the holes, as before.

This method has particular advantages for determining further corrections of arch supports which have been previously made by the physician in view of the position of the bones and the muscles. The distribution of the mass on the said support shows where further correction is needed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. The method of manufacturing arch supports, or lasts for shoes by means of a mouldable mass internally applied to the sole of a shoe, shaped by the pressure of the foot and thereafter hardening, in which a large excess of mouldable mass is internally applied to the sole of the shoe, and during shaping and after closely filling out the space between the foot and the shoe the excess of the mass is expelled by the weight of the body through one or more holes made in the shoe.

2. The method as claimed in claim 1, in which the expulsion of the mouldable mass is interrupted before the pressure been completely equalized.

3. The method as claimed in either one of claims 1 and 2, in which by filling the shoe equipped with the set support with plastic material a last is produced.

4. The method as claimed in either one of claims 1 and 2, in which the arch support is formed with holes and, after applying thereto a mouldable hardening mass, the arch support is rigidly pressed on the sole of a last and the excess of mass is expelled through the holes of the support.

5. The method as claimed in either one of claims 1 and 2, in which to an old arch support formed with holes a mouldable, hardening mass is applied and is pressed into shape within the shoe of the patient by the weight of the body, and combined with the support.

Dated this 2nd day of March, 1936.

CRUIKSHANK & FAIRWEATHER,
(Sgd.),
65—66, Chancery Lane, London, W.C.2,
and 86, St. Vincent Street, Glasgow,
Agents for the Applicants.

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FIG. 1

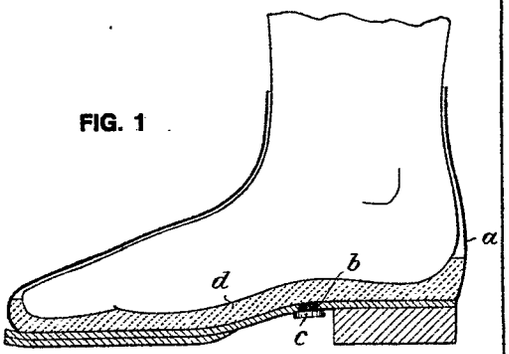


FIG. 2

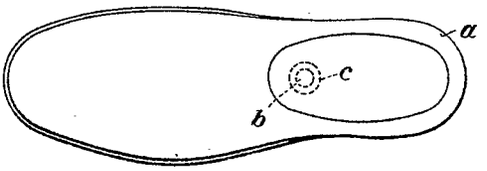


FIG. 3

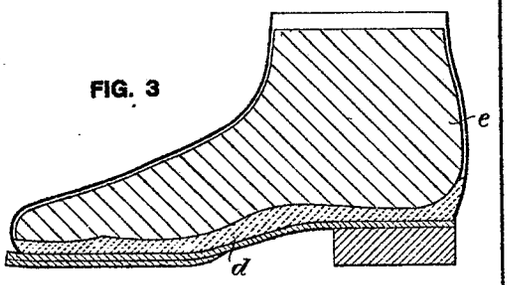


FIG. 4

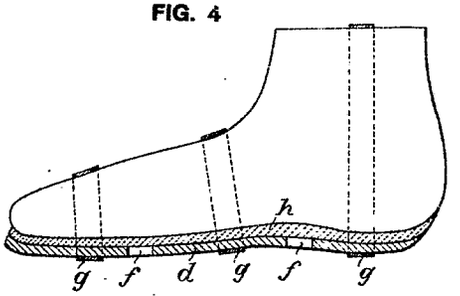
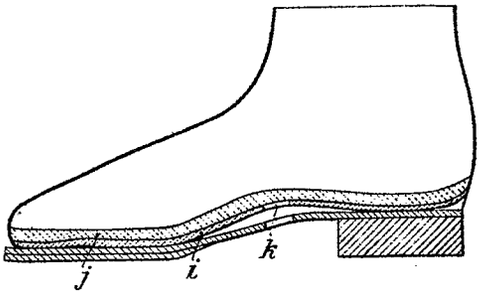


FIG. 5



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