April 27, 1948. W. L. GOULD 2,440,508

PRODUCTION OF ARCH OR LIKE SUPPORTS

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Fig. 1.

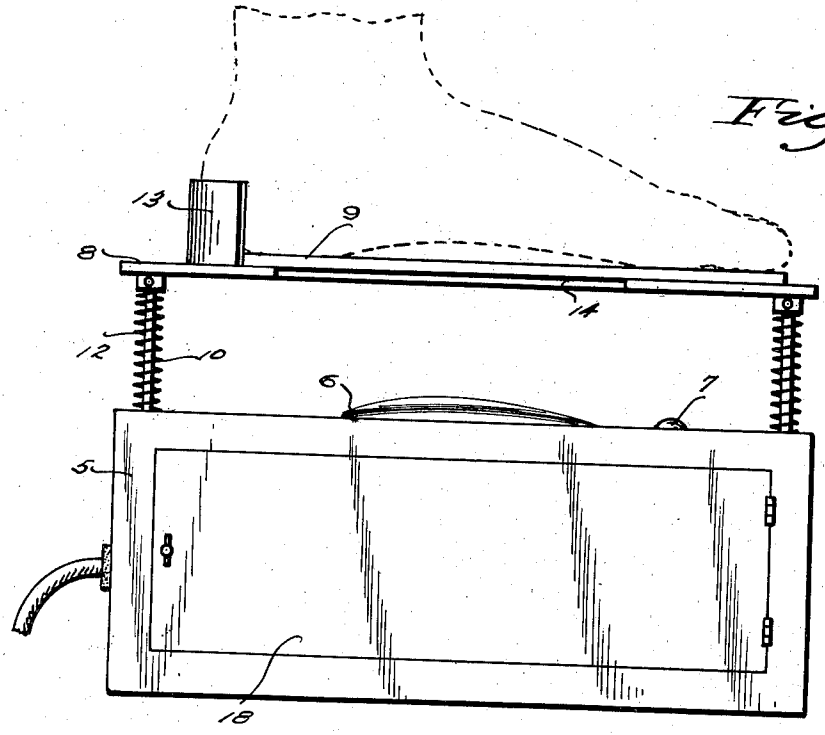
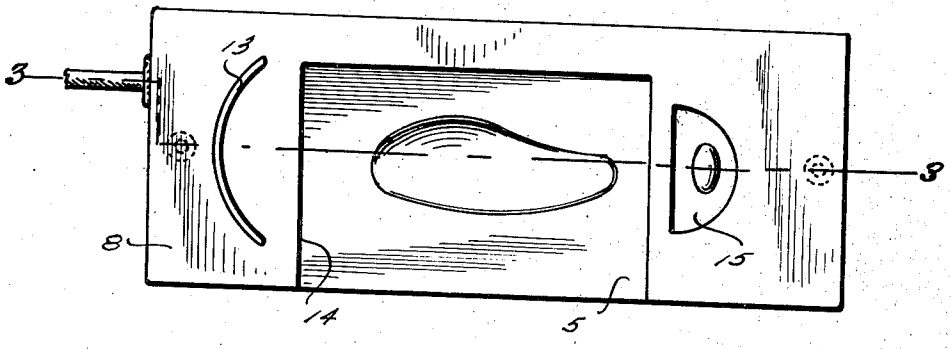


Fig. 2.



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Fig. 3.

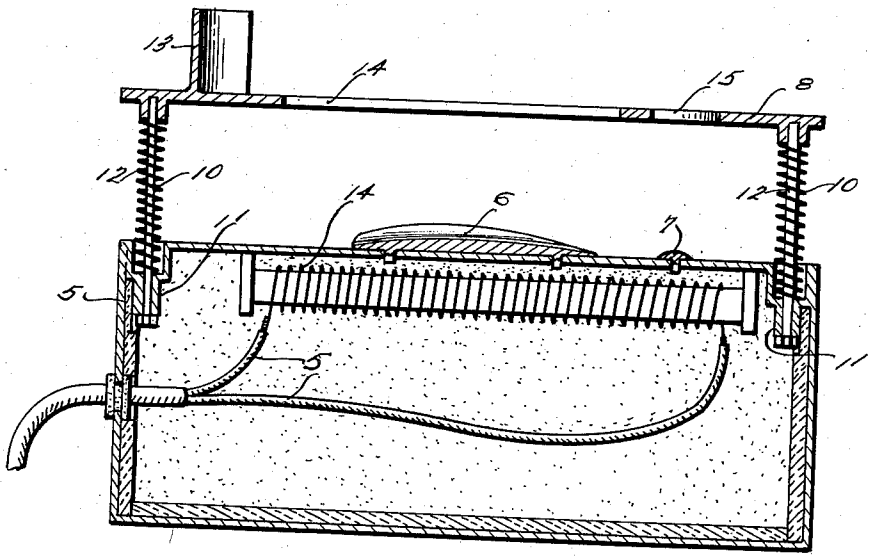


Fig. 4.

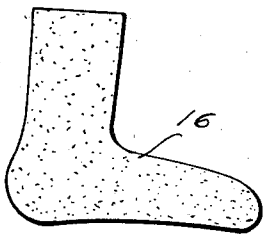
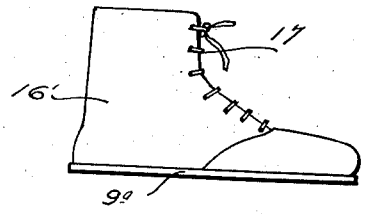


Fig. 5.



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Patented Apr. 27, 1948

2,440,508

UNITED STATES PATENT OFFICE

2,440,508

PRODUCTION OF ARCH OR LIKE SUPPORTS

William L. Gould, Albany, N. Y.

Application January 21, 1944, Serial No. 519,220

3 Claims. (Cl. 18—35)

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This invention relates to the production of arch and like supports for the feet or other members or parts of the body, and the object of the present invention is primarily to provide a method of and means for producing such supports in an easy, expeditious, economical and efficient manner.

Heretofore, in the production of arch or like supports, it has been the common practice to first make a plaster mold of the member or part to be supported, then use the mold to make a cast model of the member or part itself, and then shape the support about the contour of the cast model. Usually, the molds and models are made of plaster of Paris, and the support has been formed of metal. The use of plaster of Paris is a troublesome or messy and time-consuming operation, and the indirect method involved is expensive and difficult.

An important object of the present invention, therefore, is to provide for direct molding or shaping of the support to the member or part itself, as compared to the indirect prior method described above.

In carrying out the present invention, I provide a pattern of the member or part to be supported in the form of a sheet of plastic material. This pattern is rendered soft or readily shapable, and then the pattern is molded or shaped to the contour of the member or part to be supported. The shaped pattern is then allowed to harden or set in shaped condition.

Further objects and features of the present invention will become apparent from the following description when considered in connection with the accompanying drawings, and the invention consists in the novel method and in the apparatus consisting of the novel combination, form and arrangement of parts hereinafter more fully described, shown in the drawings and claimed.

In the drawings, wherein like reference characters indicate corresponding parts throughout the several views:

Figure 1 is a side elevational view showing one form of apparatus constructed in accordance with the present invention, and particularly adapted for the production of supports for the transverse and longitudinal arches of a foot.

Figure 2 is a top plan view thereof.

Figure 3 is a longitudinal section taken on line 3—3 of Figure 2.

Figure 4 is an elevational view showing a protector that may be worn to protect the patient against heat when the pattern is of plastic material that must be heated to render the same soft or readily shapable.

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Figure 5 shows a modified manner of providing a pattern for use in producing arch supports for the feet.

For purposes of illustration only, the drawings show an apparatus for producing arch supports for the transverse and longitudinal arches of a foot, in accordance with the present method. As shown, the apparatus may consist of a suitable base 5 upon which is adapted to be placed and suitably located molds 6 and 7 for shaping patterns to produce longitudinal and transverse arch supports, respectively. Disposed above the base 5 is a vertically yieldable horizontal foot rest 8 upon which is adapted to be placed the pattern 9 that is adapted to be shaped to provide the longitudinal and transverse arch supports. This pattern is cut from a sheet of suitable plastic material that may be softened so that it will be shaped by the molds 6 and 7 to conform to the arches of the foot when the latter is placed upon the foot rest 8 and pattern 9 for pressing the pattern downwardly against the molds 6 and 7. Thus, the pattern is shaped directly to the foot, or rather, the arch supports are formed therein so as to conform with the longitudinal and transverse arches of the foot. The foot rest 8 may be yieldingly mounted in any suitable way such as by means of vertical rods 10 attached to and depending from the ends of the foot rest and slidably extending through guides in the base 5, as at 11, helical compression springs 12 being provided on the rods and interposed between the foot rest and the base so as to normally yieldingly elevate the foot rest. A comfortable arch support may thus be produced because the person for whom the arch support is intended is the one who places his foot on the foot rest and depresses the same with only sufficient pressure to shape the pattern without causing discomfort. In order to facilitate proper placing of the foot upon the foot rest 8, the latter is provided near one end with an upstanding heel abutment 13, and it will be noted in Figure 2 that the foot rest is provided with openings or cut-away portions, as at 14, and 15, where the molds 6 and 7 respectively occur so that when the foot rest is depressed, said molds may pass upwardly through the foot rest into engagement with the pattern 9 for shaping the latter.

When the arch supports are made of plastic material which must be heated to render the same soft or readily shapable, the base 5 may have the top thereof heated so as to heat the molds 6 and 7. While any suitable heating means may be employed, I have shown the base as of hollow

form and containing an electrical heating element 14 positioned in close proximity to the top wall of the base and the molds 6 and 7, current being suitably supplied to the heating element by means of wires 15. Also, where heat is employed, it is necessary to protect the foot from the heat, and for this purpose an asbestos sock 16 of a flexible nature may be provided, as shown in Figure 4, for being donned by the patient prior to placing his foot upon the foot rest and pattern and pressing the same to shape or form the arch supports.

As an alternative, the pattern may form the sole 9a of a temporary article of footwear including an upper 16 having suitable means for securing the same upon the foot, as at 17 (see Fig. 5).

In actual operation, all that is necessary is to have the patient don the asbestos sock, then place his foot on the plastic pattern sheet resting on the foot rest, and then depress his foot so that the arch molds conform the plastic pattern sheet to the arches of the foot. The pattern is then allowed to cool and harden or set in its shaped condition.

The present method and device afford many advantages. It is time-saving because it provides for instant performance or fitting. In addition, it makes use of plastic patterns which are much cheaper than plaster of Paris and metal molds. By practicing the present method, gradual fitting of arch supports is made possible, instead of immediately lifting the entire arch from an extreme abnormal to a normal condition. After the arches have been accommodated, the patient can come back for further fittings and remoldings of the same supports, as his foot gradually becomes elevated at the arches. In practicing the present invention, there is no need to handle plaster of Paris and the mess and trouble involved therein is entirely eliminated. As a matter of fact, the whole procedure of producing the arch supports should not take a great deal more time than is frequently required to fit shoes.

As shown in Figure 1, the hollow base may be provided with a door 18 adapted to be secured closed in any suitable way and capable of being readily opened for access to the heating element should occasion require.

While the invention has been described in connection with the production of arch supports for the foot, it will be evident that the same method and type of apparatus may be employed for producing supports for various members or portions of the body. The pattern cut from a sheet of plastic material is simply supported yieldingly in position and the member or portion of the body is pressed against it and the yieldable support carrying the same so as to force the pattern into contact with a proper mold or molds by which the pattern is shaped.

From the foregoing description, it is believed that the construction and operation of the apparatus, as well as the nature and advantages of the method constituting the present invention, will be readily understood and appreciated by those skilled in the art.

What I claim as new is:

1. The herein described method of producing a support for an arch of the foot, which method consists in providing a pattern sheet of plastic material, yieldingly supporting the pattern above and spaced from a fixed shaping mold, and using the foot to move the pattern downwardly into engagement with the shaping mold so that the pattern will be shaped directly to the arch of the foot.

2. The herein described method of producing a support for a part of the human body, which method consists in providing a pattern of plastic material, yieldingly supporting the pattern in spaced relation to a fixed shaping mold, and using the part of the human body to move the pattern into engagement with the shaping mold so that the pattern will be shaped directly to the part of the human body.

3. An apparatus for producing an arch support comprising a fixed base member, a stationary shaping mold secured on said base member, a foot rest adapted to have a plastic pattern placed thereon and mounted on the base member for vertical movement relative thereto, yieldable means normally elevating said foot rest to a position above and spaced from the shaping mold, said foot rest having an opening therein for passage of the shaping mold and being depressible by the foot against the action of said yieldable means to move the pattern downwardly into engagement with the shaping mold so as to shape the pattern directly to the arch of the foot.

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