

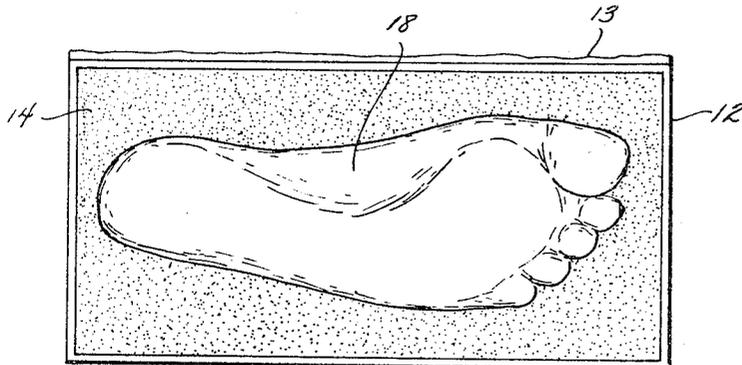
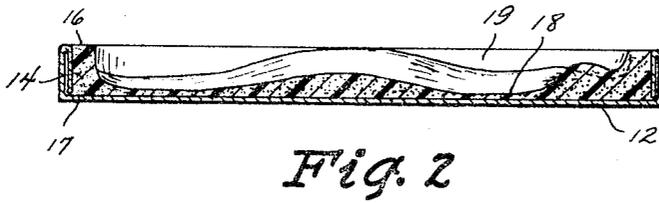
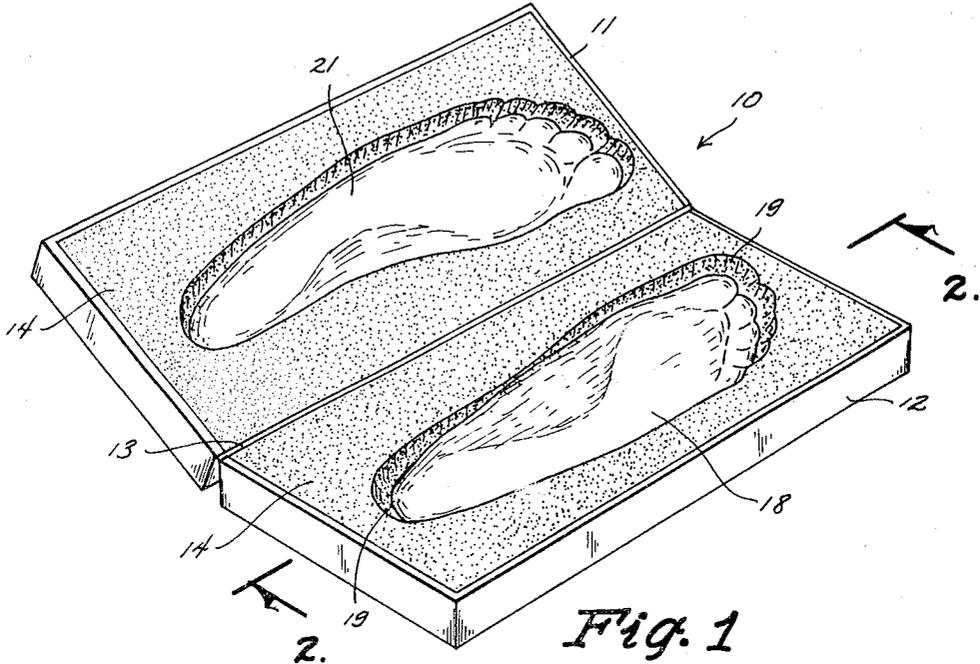
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M. H. GREENAWALT
METHOD OF MAKING AN ARCH SUPPORT BY MEASURING
AN IMPRESSION OF A FOOT

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Filed May 18, 1964

2 Sheets--Sheet 1



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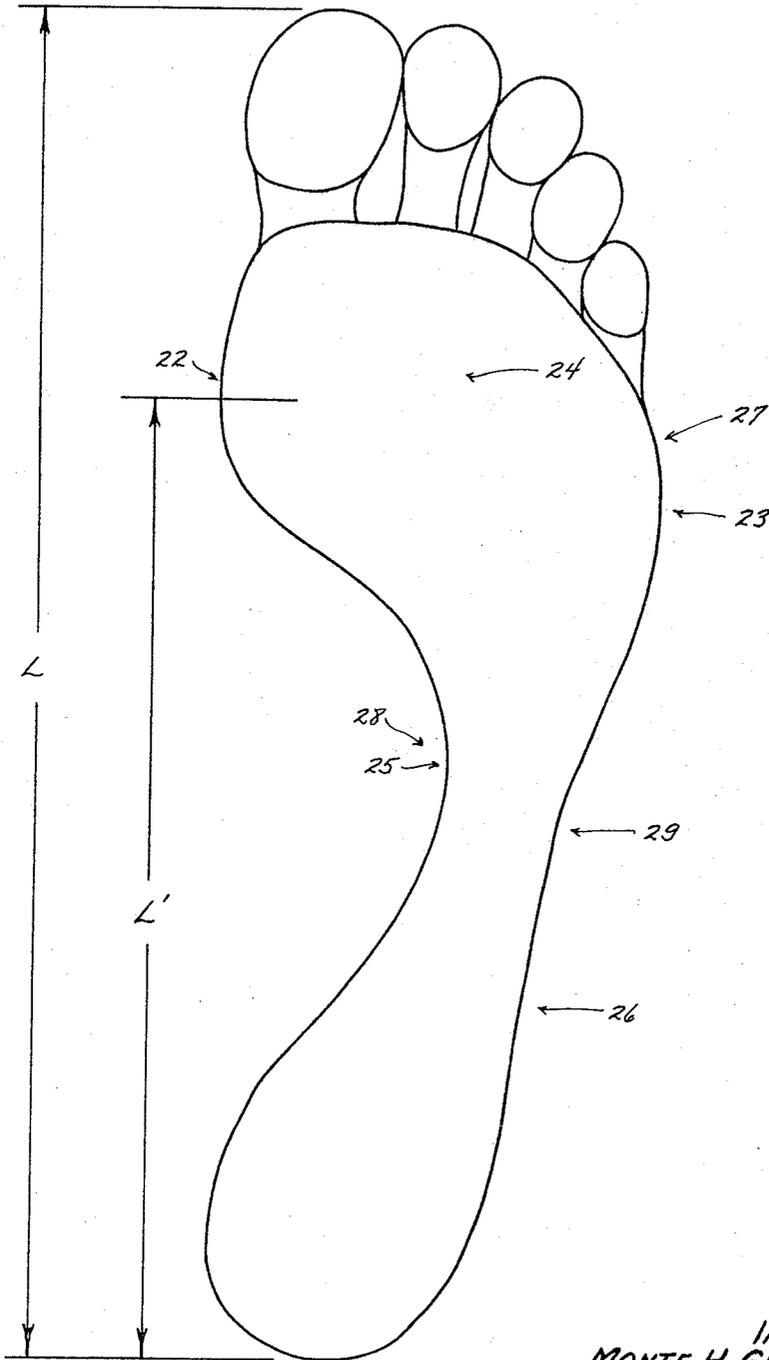


Fig. 4

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METHOD OF MAKING AN ARCH SUPPORT BY MEASURING AN IMPRESSION OF A FOOT

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This invention relates generally to the process of obtaining foot impressions for use in making orthopedic appliances, and more particularly is connected with an improved method of obtaining foot measurements for the making of arch supports.

In the making of orthopedic appliances to aid in the correction or prevention of malformations of the feet it is necessary to first make an impression of the foot to obtain a duplication of the contours thereof while the foot is positioned with the bones thereof in a normal weight bearing condition. The conventional practice, which has remained unchanged for years, is then to pour a solution of plaster of Paris or like into the negative depression whereby a duplicate mold or cast of the bottom of the foot is made upon a hardening of the solution. From the molded form, which provides an exact duplication of the contours of the foot, an orthopedic device such as an arch support or an entire shoe is made.

What has not been taught, however, in this field, is the use of the negative impression itself as a basis for obtaining the exact measurements, and observing and palpating the exact deformations; which measurements, observations, and palpations provide a precise basis for making a corrective arch support. This type of support does not duplicate the contour of the foot used to make the negative impression. Conversely, being corrective it restores normal foot balance with the greatest degree of accuracy possible to attain, through measurement and evaluation.

It is, therefore, an object of this invention to provide a novel method of obtaining foot measurements for the making of arch supports therefor.

Another object of this invention is to improve on known methods of making arch supports, by providing a method by which accurate measurements, visual observations, and touch evaluations of a negative foot impression serve as a basis for a corrective arch support, as compared to a step eliminated thereby which is a rather messy and sometimes harmful process involving plaster of Paris.

Yet another object of this invention is to provide an improved method of using foot impressions to make corrective arch supports, which method includes the use of a dry material the inherent properties of which lend themselves to an instantaneous compression and impression retention form.

It is another object of this invention to provide a novel method of obtaining foot measurements as described hereinbefore which may be performed easily and with a minimum of time and equipment, and which is effective and accurate.

These objects, and other features and advantages of this invention will become apparent upon reference to the following description when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a tray of two blocks of impression receiving material, with left and right foot impressions having been made therein;

FIG. 2 is a sectional view taken along the line 2-2 in FIG. 1;

FIG. 3 is a plan view of the single right foot impression tray; and

FIG. 4 is an outline of the right foot impression from which measurement and touch evaluations are made.

Referring now to the drawings, a packet or kit is indicated generally at 10 in FIG. 1, and comprises a pair of

trays 11 and 12. The trays are of identical size, and are of a rectangular shape or sufficient size to receive a human foot.

The trays 11 and 12 are joined along one edge by a flexible seam 13, and are movable from a closed position for shipping purposes, to an open position where both trays 11 and 12 are placeable flat against a surface, such as a floor.

A block 14 of phenolic, resinous foam is placed within each tray 11 and 12. Each block 14 is completely rectangular in its original form with a smooth upper surface 16 and a smooth lower surface 17. Each block is of such dimensions that it fits snugly within its respective tray, with the upper surface 16 on a level with the upper edges of the respective tray. The blocks 14 are manufactured of a foamable resin and can be made in varying densities. When compressed, the crushing action of the compression breaks down the foam cells so that the foam retains the shape of the impression. In actual practice, this type of foam, manufactured commercially, retains the exact configuration of that which is impressed therein.

Each tray 11 and 12, in actual manufacture, is approximately twelve inches long by six and a quarter inches wide, and has a depth of approximately one and one-eighth inches. Each block 14 has a length of approximately eleven and seven-eighths inches, a width of six inches, and a depth of seven-eighths of an inch.

The method of obtaining measurements for making a pair of arch supports is as follows; it being understood that the blocks 14 of foam are free and clear of all impressions prior to use (FIGS. 1-3 show the blocks 14 after use).

Place one tray 12, for example, flat on a floor surface (not shown) or the like. Place the right foot gently on the foam block 14, the foot being centered so as to show the entire imprint. Then have the person stand so that his weight is equally divided on both feet. The right foot is then removed from the tray.

Referring to FIGS. 1-3, the impression 18 in the foam block of the right foot is an exact duplicate of bottom of that foot. This is due to the breakdown of the cells of the phenolic resinous foam, whereby the cells remain exactly whereby they have been pressed. Furthermore, due to the compression of the cells, the bottom surface particularly of the impression 18 is more solid than, for example, the surface 16 of the foam 18, or the walls 19 of the impression. The advantage of this is seen hereinafter.

After the impression 18 of the right foot has been taken in the tray 12, the same procedure is followed as to the tray 11 with the left foot, leaving thus an impression 21 of the left foot therein. At this point of the procedure, the present invention leaves the old and conventional method. This involves pouring a solution of plaster of Paris into the impressions and allowing it to harden. The resulting cast is then removed from the foam, and should an arch support be desired to be made, leather is shaped and formed to fit the positive cast.

Conversely, the present invention eliminates the step of preparing a positive cast, and actually uses the negative impressions 18 and 21 for measurements, and visual and touch or feel observations. These measurements and observations are then corrected for the building of corrective arch supports and like orthopedic devices.

In the following description, FIGURE 4 is referred to. This figure, as mentioned hereinbefore, is an outline primarily of the lowest surface of the right foot impression 18, and is utilized for specific dimensional purposes as will be seen hereinafter. Thus, the following measurements and observations are made of the right foot impression 18, it being understood that the same measurements

and observations will be made for the left foot impression 21:

(1) The length of the foot from the heel to the toe as indicated by the letter L in FIG. 4 is measured. Such measurement, and following measurements, may be by ruler, calipers, or other instruments of accurate measurement.

(2) The length of the foot from the heel thereof to the ball of the foot is measured, as best illustrated by the letter L' in FIG. 4.

(3) The width of the foot from the first metatarsal joint indicated generally at 22 in FIG. 4 to the fifth metatarsal joint 23 is measured.

(4) The position of the metatarsal heads as indicated generally at 24 is observed by visual and palpation means.

(5) The position of the inner longitudinal arch (scaphoid), indicated generally at 25, is observed.

(6) The position of the outer longitudinal arch (cuboid) is indicated generally at 26, and this position is observed.

(7) Whether or not any of the metatarsal heads indicated generally at 24, are "dropped" is noted. This can be determined by visual observation or by palpating the compacted surface of the impression 18 in the area indicated at 24.

(8) Whether or not plantar callouses exist on the bottom of the foot can be ascertained by visual and palpation observations.

(9) Plantar abnormalities and their positions, if any, are ascertained by visual and palpation-type observations.

(10) The presence of hallux valgus (bunion) is noted by visual and touch observations.

(11) Whether or not a "Taylor's" bunion is present is noted by observation. This bunion is found off the little toe area as indicated generally at 27.

(12) Visual and palpation-type observations are made of the inside of the arch as indicated generally at 28 to indicate the presence and degree of pronation.

(13) The presence and degree of supination, always found at the outer side of the arch as indicated generally at 29, is observed.

(14) The position of the toes is visually observed.

(15) The bottom surface of the impression 18 is palpated to note any other type of planatar defects.

It has been found that the placing of Vaseline or other similar material with adhesive qualities on any of the plantar surface defects will make these defects more readily discernable and thereby enhance the evaluation of the impressions. It is important, however, to be careful in applying such adhesive material only to the defected surface, and not the surrounding area.

After careful analysis of the resulting measurements, visual observations, and palpated observations, the resulting data plus corrective measures is utilized in the laying out, of the dimensions and sizes of leather blanks for building a corrective arch support for the right foot which made the impression 18. This process of forming the corrective arch support is conventional in its steps and method and forms no part of the invention. It should not be overlooked, however, that the measurements and observations made and taken from the negative impression 18 were corrected prior to the formation of the arch support so as to provide an arch support to restore normal foot balance to the right foot.

Although a preferred method of obtaining foot measurements for making an arch support therefor has been described hereinbefore, it is to be remembered that various modifications and alterations can be made thereto without departing from the true spirit and scope of the invention as defined in the appended claims.

I claim:

1. A method of making a corrective arch support for a human foot, which comprises the following steps:
 - preparing a block of setttable phenolic resinous foam which will become stiff when set and retain the impression of a form pressed therein;
 - placing the block on a stationary surface;
 - pressing the foot into the block to make a negative impression thereof;
 - removing the foot from the impression;
 - measuring the contours of the impression; and
 - forming one or more pieces of leather into a corrective arch support while employing said measurements to accommodate the arch support to the foot from which the impression was made.
2. The method of claim 1 and wherein said measurements are made by a mechanical device.
3. The method of claim 1, and wherein said measurements are made by palpation with the hand.

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