

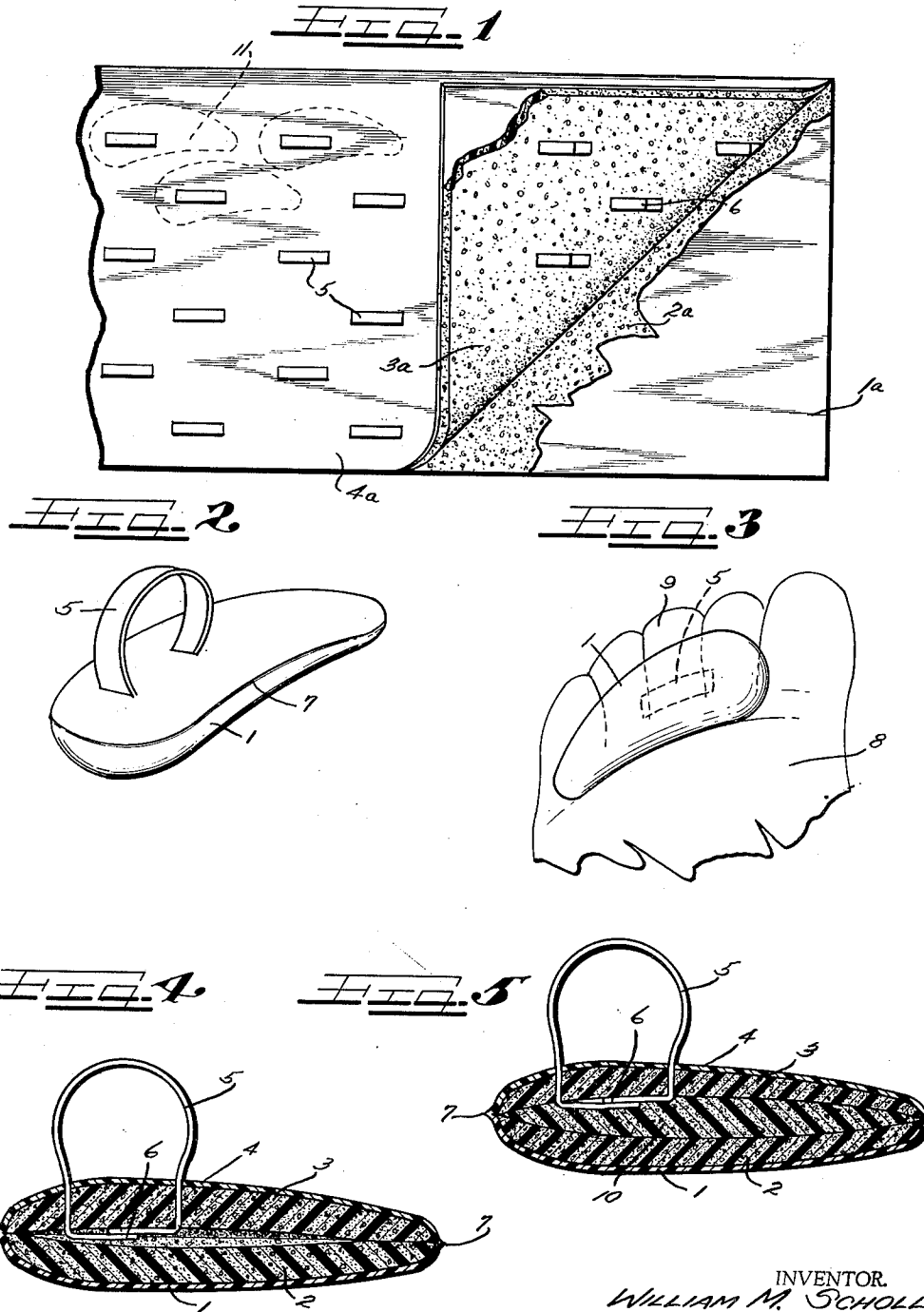
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BUTTRESS PAD AND METHOD OF MAKING THE SAME

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BUTTRESS PAD AND METHOD OF MAKING THE SAME

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4 Claims. (Cl. 128-81)

This invention relates to improvements in a buttress pad and to a method of making the same, the invention being highly desirable for direct attachment to the human foot in position to be gripped by a plurality of toes at each step, and the invention is particularly valuable for alleviating calluses, hammer toes, and exercising, restoring, and strengthening weak muscles and strained ligaments in the foot, relieve arch sag, strengthen and raise the metatarsal arch, and perform other corrective functions as will be apparent to one skilled in the art.

More specifically the instant invention finds its form in a resilient pad which may readily be attached directly to the naked foot by means of a digit loop, with the pad disposed beneath the toes in position to act as a buttress and be gripped by the toes at each step, thus giving the toes substantially constant exercise without discomfort to the user and consequently reactivating and revitalizing weak muscles and strained ligaments in the foot, giving the beneficial results above outlined, and aiding in the prevention of afflictions or defects from ultimately developing.

It has been found that as a person reaches or passes middle age, even with healthy and normal feet there is a tendency for the adipose tissue from in front and beneath the metatarsal heads to move forwardly into the sulciform regions of the toes, and gradually the toes lose their flexibility and gripping power, giving rise to the development of adverse metatarsal conditions. The instant invention is designed to prevent such occurrence, and also to alleviate afflictions already present.

In the past, attempts have been made to remedy such conditions by providing prescribed exercise programs with or without artificial aid, but it has been found that in most cases it is virtually impossible to have a patient periodically and faithfully take the time to go through with such exercises. Other attempts have been made to provide toe gripping means which were in the main installed or built into an article of footwear, and in rare instances designed for attachment to the foot of a user. However, these means, in every instance of which I am aware, consisted mainly of a flowable or impression taking material, which responded to body temperature and foot pressure to shape itself in keeping with the foot resting upon it, the material not being resilient but retaining the impression. However, with such material the impression could be changed periodically depending upon the activity of the user, and a sudden rise upon the toes could create an impression of a character not desired for ordinary walking, and this impression would be retained by the material for a period of time. Accordingly, the actual means to be gripped by the toes was fluctuating in character, more than likely not of the correct shape most of the time, and in any event time was required to acquire any reasonable shaping of the material. In the event such material was built or installed in an article of footwear, for the user to have the adequate exercise it would be necessary to have such installation in all of the footwear used by the individual, thereby rendering the entire program objectionably expensive.

With the foregoing in mind, it is an important object of the instant invention to provide a preformed and shape retaining buttress pad for direct attachment to the human foot.

Also an object of this invention is the provision of a buttress pad made of resilient material restrained from migration under pressure, which pad is provided with a digit loop for attaching the same to a foot.

5 A further desideratum of this invention is the provision of a buttress pad or the like which is preformed and shape retaining, and which is tapered in keeping with the decrease in the size of the toes toward the outside of a foot.

10 Also an object of this invention is the provision of a buttress pad or the like for use on the human foot which may readily be manufactured economically and with various degrees of firmness, as may be desired.

15 Still a further feature of this invention resides in the provision of a buttress pad directly attachable to the human foot, and which comprises a plurality of layers of heat sealable foam material tightly encased in a cover of heat sealable plastic film, the entire structure being flexible and resilient, shape retaining, with the foam prevented from migration under pressure by the film covering.

20 Still another feature of the instant invention is the provision of a new and novel method of making a surgical pad or the like, having a digit loop thereon.

25 While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which:

30 FIGURE 1 is a fragmentary plan view, with parts broken away and parts laid back, of superposed layers of material, illustrating steps in the process embodying principles of the instant invention;

FIGURE 2 is a plan view of a finished buttress pad;

35 FIGURE 3 is a fragmentary bottom plan view showing the pad in operative position on a human foot;

FIGURE 4 is a longitudinal vertical sectional view through the buttress pad itself, with the digit loop shown in elevation; and

40 FIGURE 5 is a view similar in character to FIGURE 4, but showing a pad of slightly different construction.

As shown on the drawings:

45 With reference more particularly to FIGURES 2 and 4 it will be seen that this illustrated embodiment of the instant invention comprises four superposed layers of material and a digit loop. The layers include a bottom layer 1 which is a thin thermoplastic sheet or film of a heat sealable type such, for example, as a vinyl or acetate film. The second and third layers 2 and 3, from the bottom, are each a heat sealable foam material, such for example as polyvinyl chloride foam, a polyurethane foam, or the equivalent. These sheets are of course resilient with excellent restorative properties. The top or cover layer 4 is preferably of the same film material as the lower layer 1.

50 A digit loop 5 which may satisfactorily be made of commonly known woven fabric elastic ribbon extends through suitable slots in both the cover film 4 and upper foam layer 3, and has its ends secured together as indicated at 6 on the inside of the foam layer 3. The ends may be secured together in any suitable manner such as by adhesive, stitching, stapling, or the equivalent. With the secure end portions located between the two foam layers 2 and 3, there can be no discomfort to the wearer of the pad since the secured ends are effectively cushioned beneath the foam layer 3 and cannot be felt by the wearer.

55 The layers are joined together by a fine line heat seal seam 7 defining the bounding edge of the resultant pad. The heat seal seam 7 includes the lower and upper film layers 1 and 4 and may also have the bounding edges of the foam layers 2 and 3 caught in the same seam. The seam is preferably composed only of the material of the layers

and may be made with electrode heat sealing dies in an electronic high frequency heat sealing press.

It will be noted that the pad is thicker in the central region and curves in all directions toward the fine line heat seal seam, the inside curvature of the foam layers being maintained by the joined film layers 1 and 4 as well as by the heat seal seam, and the film layers have sufficient tensile strength to maintain the foam confined. It will be further noted that the pad is wider at one end than at the other, tapering in keeping with a decrease in size of the toes toward the outer side of the foot, and the digit loop is preferably disposed nearer the wide end than the narrow end.

It should be borne in mind that the space between the central portions of the layers 2 and 3 as seen in FIGURE 4 would be present if the pad were actually severed through the central portion, but when the pad is in its solid state such space would not appear, the two layers being substantially in face to face contact with each other throughout their confronting surfaces.

In FIGURE 3 I have illustrated the device in operative position on a human foot 3. The device is disposed on the foot with the digit loop 5 encircling the third or middle toe of the foot. This leaves the device disposed beneath the sulciform regions of the four minor toes, but the device extends to only a small degree beneath the great toe. This eliminates the probability of the great toe preventing proper exercise of the four minor toes by taking over a major portion of the load. The wide end of the device is disposed toward the great toe, while the narrow end of the device underlies the smallest or fifth toe. The buttress pad is directly in contact with the naked foot, and therefore is not inhibited in its corrective properties by a stocking between the foot and the pad which permits added relative movement between the foot and the pad and prevents proper exercise of the toes during walking. The use of the pad in this manner also permits proper exercising of the foot during normal walking with the customary footwear and the pad can be comfortably worn the full time the footwear is also worn, and articles of footwear may be changed at will without disturbing the pad on the foot. Thus, the user need take no period of time away from his other duties or activities for the sole purpose of exercising the feet. The device is originally shaped to the desired contour, and requires no time to become properly shaped, as was the case with formerly known means worn within articles of footwear for the same general purpose. The device is held at all times in the desired shape and its resiliency and stability remain constant at all times, so there is no chance of the pad assuming any but the proper shape it originally had. The pad will yield somewhat under pressure of the foot but will immediately assume its original shape upon pressure relief and, the pad substantially maintains its shape since the foam layers are confined against migrating under pressure, even though it may yield somewhat to the weight of the user.

In FIGURE 5 I have illustrated a pad of slightly different construction to indicate that the firmness of the pad may be varied during manufacture without materially adding to the cost of the pad. The structure of FIGURE 5 has the same layers as the structure above described, the same digit loop, and the same type of heat seal seam 7 joining the layers. In this instance, however, a third layer 10 of foam is included which is disposed between the foam layers 2 and 3 above described. Thus, when the pad of FIGURE 5 is shaped and heat sealed by the electrode dies, it is compressed to a greater extent by virtue of the added foam layer than was the pad previously described, and a firmer more dense pad is provided. This adds to the proper treatment of a greater number of afflictions, because some afflictions or conditions will indicate the need of a firmer and denser pad than is necessary for proper alleviation of other afflictions.

The method of making the pad is extremely simple and economical. Flat blanks of materials corresponding to

the layers of the pad are utilized, and these blanks are of indefinite size depending upon the size of the dies, since the dies will be arranged to form a number of pads in a single operation.

The blanks are stacked in the order of the layers above mentioned in regard to the pad itself on the lower of the electrode dies. This lower die may be in the form of a flat plate having a suitable dielectric buffer thereon which can satisfactorily be polytetrafluoroethylene or equivalent material and which remains upon the die throughout numerous operations. Upon the buffer plate a film blank 1a is disposed and superposed upon that film blank is a foam blank 2a. Another foam blank 3a and the top film blank 4a are first provided with complementary slits therein, and through each pair of slits, the end portions of a digit loop 5 are disposed, and the digit loop ends are connected as at 6 on the underside of the foam sheet or blank 3a. This assembly of the foam blank 3a, the top film blank 4a, and the digit loops is then placed upon the aforesaid foam blank 2a. With the blanks so stacked, the upper die having a plurality of individual die elements thereon, each shaped in accordance with the desired outline of the resultant pad or as indicated by dotted lines 11 in FIGURE 1, is brought down under pressure upon the lower die, a charge of high frequency current passed momentarily through the dies, and the heat seal seam 7 which may also be called a tear seal seam is provided. The waste may then be easily removed from around the outline of each individual device. Any air that may be forced out of each individual pad during the compression of the dies is promptly replaced through the slits adjacent the digit loop so that the foam layers will immediately assume, as much as possible, their original condition and the pad will be of the proper size and resiliency.

From the foregoing, it is apparent that I have provided a buttress pad preformed to the desired shape and which is shape maintaining during use, which may be attached directly to the naked foot of the user, which may be worn with any article of footwear for any desired length of time without discomfort and while the user goes about his normal duties and activities, which is effective in reactivating and reconditioning the foot as well as to alleviate and correct certain foot abnormalities or afflictions, which is durable and very long lived, and which can be economically manufactured by the practice of an economical method.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. A buttress pad comprising upper and lower cover layers of plastic film, a plurality of layers of plastic foam superposed between said cover layers, the upper cover layer having a pair of spaced slits therein in an intermediate location, the upper of said foam layers having slits therein aligned with those in the upper cover layer, a digit loop having portions thereof threaded through said aligned slits and its ends secured together beneath said upper foam layer, and a fine line heat seal seam joining said cover layers and defining the bounding edge of the pad and confining said foam layers curving toward said seam and held against lateral migration under pressure.
2. A buttress pad to underlie a plurality of toes of a user and comprising upper and lower thin cover sheets secured together around their bounding edges, a thicker sheet of cushioning material confined between said cover sheets, said upper cover sheet having spaced slits in an intermediate location, said sheet of cushioning material having spaced slits

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therein in alignment with those of said cover sheet, and
 a digit loop having opposed portions thereof threaded through said aligned slits and the ends thereof secured together beneath said sheet of cushioning material. 5
 3. The method of making a buttress pad for direct attachment to the foot of a user, including the steps of superposing a top cover sheet of plastic film on a thicker sheet of cushioning material,
 providing a plurality of spaced sets of pairs of aligned 10
 slits through both of said sheets,
 threading the end portions of an elastic strip through the slits of each pair and securing the end portions of each said strip together beneath the sheet of cushioning material to form a digit loop extending above said 15
 top cover sheet,
 placing a bottom cover sheet of plastic film with another layer of cushioning material thereon beneath said slitted cushioning layer, and
 heat and tear sealing the cover layers together in a plurality of locations to form heat seal seams each of 20
 which defines the bounding edge of a pad with a digit loop in an intermediate location.
 4. The method of making a buttress pad for direct attachment to the foot of a user, including the steps of 25
 superposing a top cover sheet of plastic film on a thicker sheet of cushioning material,
 providing spaced pairs of aligned slits through both said sheets,

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threading an end portion of an elastic strip through each pair of aligned slits and securing the ends of said strip together beneath the cushioning material, placing a bottom cover sheet beneath said cushioning sheet, and

heat and tear sealing said sheets together to form a fine line heat seal seam defining the bounding edge of the pad with the digit loop in an intermediate location.

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