Jan. 18, 1966 W. M. SCHOLL 3,229,690

DIGIT PROTECTOR

Filed July 31, 1962

Fig. 1

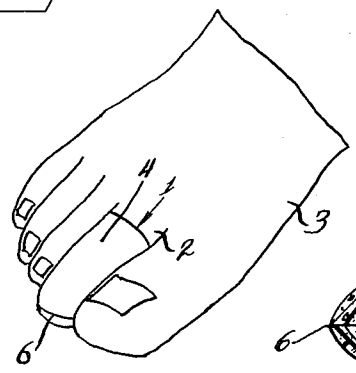


Fig. 3

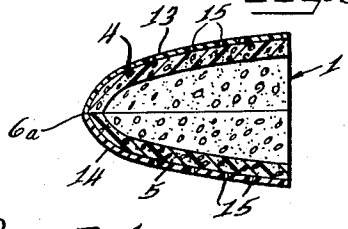
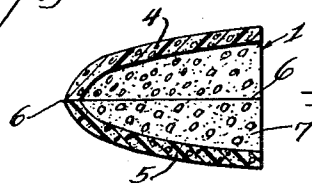


Fig. 2



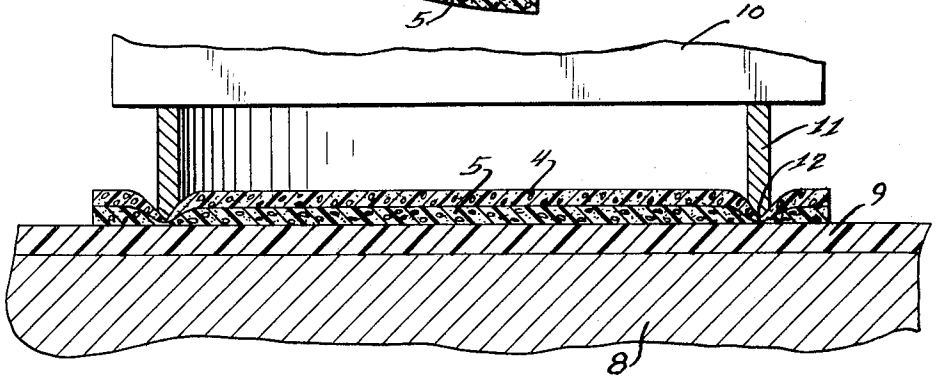


Fig. 4

Fig. 5

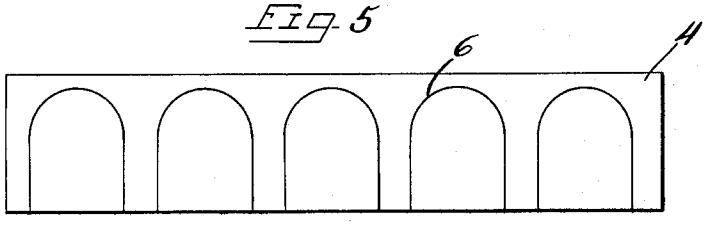
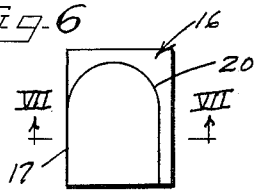


Fig. 6



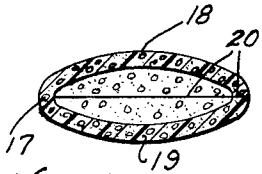


Fig. 7

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United States Patent Office 3,229,690 Patented Jan. 18, 1966

3,229,690

DIGIT PROTECTOR

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Filed July 31, 1962, Ser. No. 213,632
3 Claims. (Cl. 128—153)

This invention relates to improvements in a digit protector, the invention being highly desirable for use as a toe protector in treating corns or callous tissue forming on the end or sides of the toe, injuries or soreness adjacent the ends of the toes, ingrown nails, and other similar afflictions, although the invention may equally as well be used upon the tip of a finger and for other purposes, as will be apparent to one skilled in the art.

While numerous types of digit protectors have been provided in the past, when they were made in the form of stalls or cots and of soft cushioning material, they frequently were objectionably bulky and difficult to properly position and maintain the proper position on intermediate toes or fingers. Furthermore, devices of this character as made heretofore have not been satisfactorily soft and light in weight, and have always been objectionably expensive to produce both as to the cost of material, and labor involved in production.

With the foregoing in mind, it is an important object of this invention to provide a digit protector that is extremely comfortable to use yet may be produced more economically than was possible heretofore.

Also an object of this invention is the provision of a digit protector made of a soft cushioning type material and which when placed upon any digit does not present a feeling of bulkiness to the user.

Also an object of this invention is the provision of an extremely soft and light in weight digit protector which may be made of one or two pieces of cushioning material secured together around the bounding edge save for the open end.

It is also a desideratum of this invention to provide a simple form of cushioning digit protector which need only comprise two layers of a synthetic resinous foam heat sealed together by a fused seam defining the bounding edge of the resultant device save for the open end thereof.

Still another object of this invention is the provision of a simple form of cushioning digit protector made from a single folded piece of material with the part away from the fold line joined by a heat seal seam partially defining the bounding edge of the resultant digit protector.

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:

FIGURE 1 is a fragmentary diagrammatic perspective view of a human foot showing a digit protector embodying principles of the instant invention in operative position thereon;

FIGURE 2 is an enlarged central vertical cross-sectional view through the digit protector itself;

FIGURE 3 is a view similar in character to FIGURE 2 but showing a slightly different form of construction;

FIGURE 4 is a fragmentary part elevational part sectional view, greatly enlarged, illustrating a step in the process of making the instant invention;

FIGURE 5 is a somewhat diagrammatic plan view further illustrating the process of making the device;

FIGURE 6 is a plan view similar in character to FIGURE 5, but illustrating a different process of making a device embodying principles of the instant invention; and

FIGURE 7 is a transverse sectional view through the finished device itself taken substantially as indicated by the line VII—VII of FIGURE 6.

As shown on the drawings:

In FIGURE 1 I have illustrated an embodiment of the instant invention, generally indicated by numeral **1**, in operative position upon the second toe **2** of a human foot **3**. In placing the device upon the toe, it is simply necessary to slip it easily over the end of the toe. No securing means are necessary since the material from which the device is preferably made is soft and clinging to the skin of the user in a highly comfortable manner, but also in a manner that tends to discourage misplacement or movement of the device relatively to the skin of the user.

The material from which the protector is preferably made is a synthetic resin foam capable of being electronically heat sealed. For this purpose, vinyl, polyurethane, polyester, isocyanate and similar foams are satisfactory. Such material is soft, durable, and extremely comfortable without giving a feeling of bulk when in use. Furthermore, the foam is preferably of the type having intercommunicating cells so as to be ventilative and vapor porous.

With reference more particularly to FIGURE 2, it will be seen that the protector is in the form of a cot or stall and need only comprise two layers **4** and **5** of the foam cushioning material, both layers being preferably identical in size, thickness, and density, although if for any special reasons it might be desired, these properties could be varied. The layers are joined together by a heat seal seam **6**, preferably a fine line heat seal seam, which defines the bounding edge of the protector, except for the open end **7** thereof. It will be noted that the protector does not have substantially a cylindrical shape with a blunt end closure, or of a slightly conical shape with a relatively blunt end closure, as has been common in the past. On the other hand, the instant device is preferably of substantially cuneiform overall shape with the layers **4** and **5** diverging rearwardly from a substantially transverse line at the heat seal seam **6** forming the outer end closure. When applied the protector shapes itself to the particular digit but because of its initial cuneiform shape, there is no excess of material at the distal end of the digit to which the device is applied.

The protector is simply and economically manufactured, with the aid of electronic heat seal means which may be in the form of a suitable electronic heat sealing press having dies therein and a source of high frequency current to be momentarily passed through the dies at each operation, such equipment being well known in the art.

With reference to FIGURE 4, it will be seen that a lower die in the form of a flat upper faced member **8** may be utilized upon which is preferably disposed a dielectric buffer sheet **9**. On the buffer sheet the foam layers **4** and **5** are placed in superposed relationship. With the sheets so positioned adjacent the edge of the die **8** and dielectric sheet **9** as seen best in FIGURE 5, an upper die comprising a base **10** and a U-shaped die element **11** depending therefrom with a knife edge **12** on the lower end of the die element, is brought down under pressure upon the sheets and a momentary charge of ultra high frequency current passed through the dies and the sheets, thus fusing the sheets together into a fine line heat seal seam as indicated at **6**. At the same time the heat seal seam is formed a tear line is established on the outside of the seam by means of which the waste stock may readily be removed from around each protector. As indicated in FIGURE 5, multiple dies might be utilized so that a plurality of protectors are formed at each operation. With the die element **11** U-shaped to form the seam **6** as outlined in FIGURE 5, the two layers are not fusedly joined together at the open end edges of the layers which

are separated at least slightly because of the seam and define an opening into a digit-receiving pocket of the resultant digit protector.

It will be at once understood that the method is extremely economical, embodying little labor, and not only connecting the parts, defining the object, and providing a tear line for removal of the object from waste material in a single operation.

Should it be desired to wear the protector in an exposed position, such as in a sandal or open toed shoe, or upon the hand without any other covering, it may be desirable to provide a thin covering over the device to increase its wearing qualities. To this end I have illustrated in FIGURE 3 a protector embodying the same foam layers **4** and **5**, but on top of the foam layer **4** is a covering **13** which may satisfactorily be in the form of a thin vinyl or acetate film, or a film made of equivalent material that is responsive to electronic heat sealing. A similar film **14** is disposed beneath the lower foam layer **5**. The sheets and films may be stacked in that particular order upon the dielectric buffer **9**, the same dies utilized in the manner above described, and a heat seal seam **6***a* will be established which unites not only the two foam layers **4** and **5** as above described but also the films **13** and **14**. At the same time, a tear line will be established for the ready removal of the waste stock. The resultant protector as seen in FIGURE 3 will be of the same shape as the one previously described, but it will be sheathed by the film layers **13** and **14** with all four layers joined at the heat seal seam **6***a* so there can be no maladjustment of parts occur. The device is utilized in the same way as the one previously described, and the films **13** and **14** may be initially supplied with a plurality of perforations as indicated at **15** to preserve the ventilative and vapor porous properties of the protector.

In FIGURES 6 and 7 I have illustrated another simple embodiment of the instant invention, wherein the digit protector is made of a single piece of material generally indicated by numeral **16**. This single piece of material is folded as at **17** to provide overlying layers **18** and **19**. These layers are then joined by a heat seal seam **20** curving away from the line of fold **17** to form an arcuate closed end for the protector, and then paralleling the line of fold to the edge of the sheet as clearly seen in FIGURE 6, providing a protector of the same general shape as above described when the protector is completed. It will be noted from the showing in FIGURE 7 that the protector is generally cuneiform in shape, the only difference is that the heat seal seam partially defines the bounding edge of the protector, while the line of fold **17** defines the remainder of the bounding edge. In this instance, of course, the die would have a working edge shaped in accordance with the seam **20** as seen in FIGURE 6.

From the foregoing, it is apparent that I have provided a highly economical form of digit protector which is soft, light in weight, cushioning, and is extremely comfortable taking up less room under another article of apparel when applied to the end of a digit. Moreover, the device may be made by a simple, quick, and highly 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 digit protector for selective slip-on application over the end of an individual digit, consisting of

a pair of thermoplastic foam layers superposed throughout their confronting faces, and

a U-shaped heat seal seam joining said layers inwardly from unsecured end edges of said layers which are separated slightly because of said seam and define an opening into a digit-receiving pocket, and

said seam being in the transverse median plane of the protector.

2. A digit protector for selective slip-on application over the end of an individual digit, comprising

a pair of thermoplastic foam layers superposed throughout their confronting faces,

a pair of smooth perforated thermoplastic cover films thinner than said layers and disposed above and below said layers, and

a U-shaped heat seal seam joining said layers and films inwardly from unsecured end edges of the same and which end edges define an opening into a digit-receiving pocket,

said seam being in the transverse median plane of the protector, and

said seam and the unsecured end edges between the ends of the seam conjointly defining the bounding edge of the protector.

3. A digit protector for selective slip-on application over the end of an individual digit, consisting of

a sheet of thermoplastic foam folded to provide superposed layers,

a heat seal seam joining said layers and extending curvately from the line of fold and then paralleling said fold to a point spaced from the fold along a pair of unsecured edges of said layers,

said fold, seam, and unsecured edges therebetween defining the bounding edge of the protector and affording a digit-receiving pocket opening between said unsealed edges, and

said seam and fold being in the transverse median plane of the protector.

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