Oct. 31, 1950 T. STEVENSON 2,528,456

FIXING SPLINT FOR INJURED BODY APPENDANTS

Filed March 7, 1949

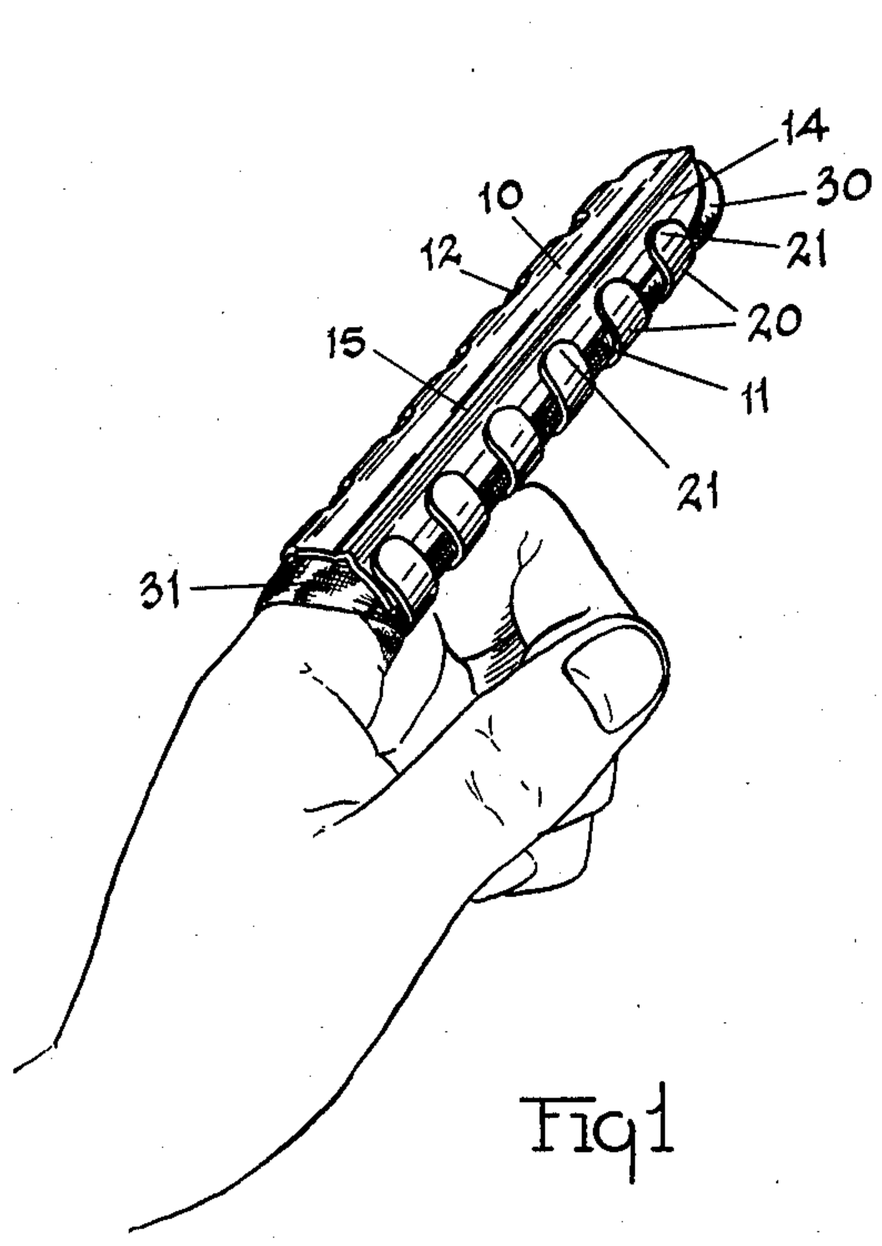


Fig 1

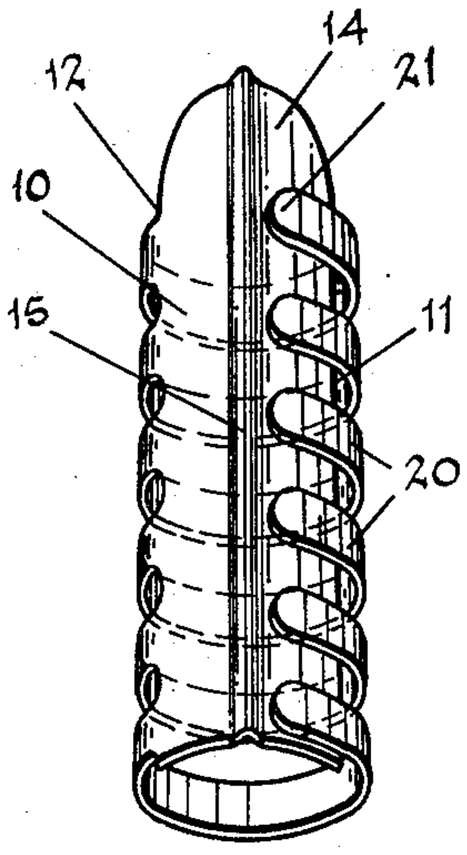


Fig 2

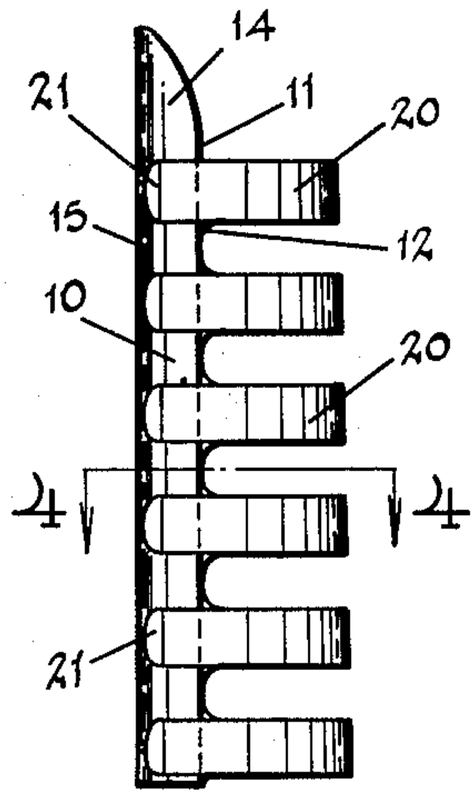


Fig 3

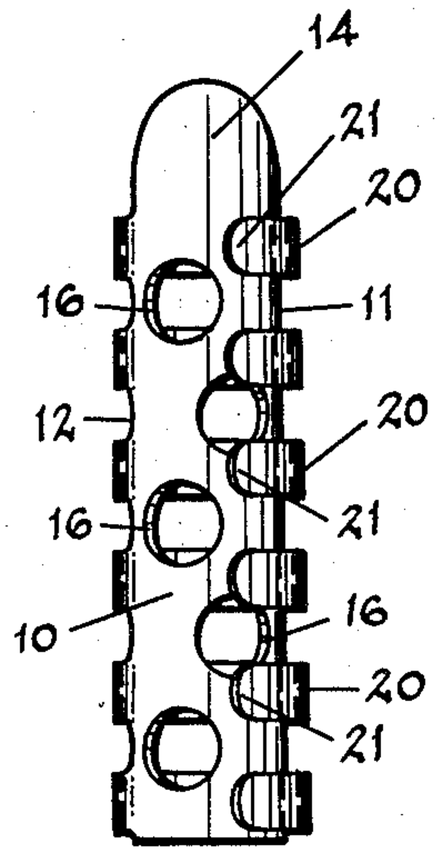


Fig 5

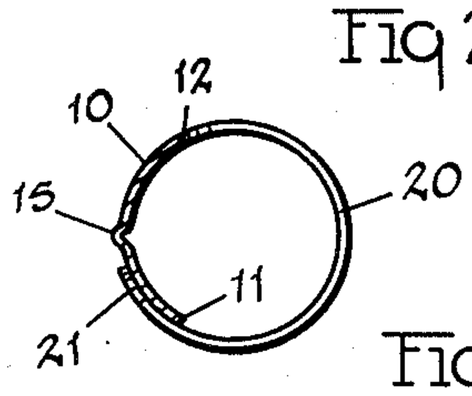


Fig 4

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## FIXING SPLINT FOR INJURED BODY APPENDANTS

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2 Claims. (Cl. 128—87)

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My invention relates to the medico-mechanical arts. Particularly, the invention pertains to an immobilizing splint appliance, usable in the medical arts for fixing an injured body appendant against movement during a treatment period.

The injury of a body appendant, such as a finger digit, very often requires immobilizing treatment to effect repairing cure. Early practice largely included use of wooden battens held in place by bandage wrappings or by various forms of plaster casts. Subsequently, a predecessor to me brought forward a suggestion of guard caps, similar to those shown in United States Letters Patent No. 1,684,076.

Possibly, workers in the art might have found adaptable suggestions in anti-thumb sucking devices similar to those shown in United States Letters Patents 1,800,755, 1,814,273 and 2,143,927; in finger-nail guards or shapers, similar to those shown in United States Letters Patent Nos. 1,917,794 and 2,225,571; or in cut-resisting thumb or finger guards, similar to those shown in United States Letters Patent Nos. 1,755,014; 1,863,960 and 2,070,506. However, I am not aware that anyone has availed himself of any suggestion that may reside in such patents to provide a fixing split for an injured body appendant. Consequently, any suggestion asserted to reside in the mentioned patents has escaped the attention of those skilled in the art, the last advance in the art having occurred in 1928 upon issue of my said predecessor's aforesaid United States Letters Patent No. 1,684,076.

The device of my aforesaid predecessor, while obviating the cumbersome wooden batten or cast, omits the lateral brace needed to immobilize the injured body appendant and means independent of applied bandage wrappings for holding such brace in applied position. Fundamentally this prior device provides a digit tip cap with a plurality of free ended tongues extending axial-wise of the digit appendant and adapted to cage the same. The tongues are held against deflection by bandaging. Thus, the tightness of the bandage wrapped about the tongues determines the rigidity of the tongues to lateral deflection. The resulting objectionable feature of pressure on the injured body appendant is immediately apparent to those skilled in the art. Besides annoyance to the patient, such pressure hinders the flow of blood in the injured appendant. Repair of the damage or injury thereof is thus delayed.

My invention has for an object to provide a splint having all the advantages of weight lightness, unencumbering size and free ventilation

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possessed by my said predecessor's splint, together with the provision of lateral bracing means and brace holding means independent of any wrapping bandage. Another object of my invention is to provide a splint formed from a sheet of plastic derivative of cellulose or protein or of a material resulting from chemical condensation or polymerization. Hence, the splint may be inexpensivey formed, and following use thereof, may be disposed of with little relative cost.

A particular object of my invention is to provide a fixing splint for an injured body appendant comprising a strip of limitedly flexible sheet material—having a plurality of tongues originating at spaced points along one of the long side edges of the strip and extending substantially parallel and to the opposite side edge of the strip where the free ends of the tongues overlap and contact a surface of the strip—to form a plurality of spaced bands of individually self-adjustable dimension and uninterrupted continuity circuitously engaging spaced zones on an injured body appendant and supporting the strip in batten-bracing relation thereto. Another particular object is to provide such splint strip with an arcuate contour, when viewed endwise, substantially fitting the contour of the appendant of application. Still another particular object is to provide such split strip with an end extension, forming manually gripping means for manipulating the splint in application to the appendant.

A further particular object of my invention is to provide a splint strip as described with a ridge-like bead extending across the strip, preferably lengthwise thereof, serving as reinforcing means for the strip. Preferably, the invention contemplates that such bead protrudes outwardly from the outer surface of strip so as not to bear against the appendant. The bead provides means adapted to engage the free end edges of the tongues and thereby limit the degree of constriction of the tongues about the body appendant of application. A still further and more particular object of the invention resides in the provision of ventilating perforations in the strip.

An object of the invention having more than casual importance is to provide a tongued splint as above described of a material susceptible to cutting by ordinary household or surgical shears. Thereby certain tongues may be easily separated from the strip in desired zones to modify the splint appliance according to the needs of a particular application.

The invention consists in other features and

advantages which will appear from the following description and upon examination of the drawing. Structures containing the invention may partake of different forms and still embody the invention. To illustrate a practical application, I have selected a Fixing Splint for Injured Body Appendants and a modified form thereof as examples of the various structures and details thereof that contain the invention and shall describe the selected structures hereinafter. It is understood that variations may be made without departing from the spirit of the invention. The particular structures selected are shown in the accompanying drawing and described hereinafter.

Fig. 1 of the accompanying drawing illustrates pictorially a preferred form of fixing splint for injured body appendants embodying the features of my invention in an applied relation to a finger digit. Fig. 2 illustrates a perspective view of the splint shown in Fig. 1. Fig. 3 illustrates a side elevational view of the splint shown in Fig. 2. Fig. 4 illustrates a view of a section taken on the plane of the line 4—4 indicated in Fig. 3. Fig. 5 illustrates an elevational view of a modified form of a splint embodying a detail feature of my invention.

The embodiments of my invention shown in the accompanying drawing are formed from a relatively inexpensive, light weight, substantially non-porous material. Preferably, one of the synthetic polymers having elastic characteristics provides in sheet form a desired material, from which to form a splint in accordance with my invention.

In the main, the illustrated embodiments have a bracing batten strip and means for mounting the strip adapted to engage an injured body appendant. The strip, preferably, has an arcuate contour when viewed endwise approximating the contour of the appendant of intended application. Also, preferably, the strip has a ridge-like bead extending lengthwise of the strip through a medial zone thereof. The bead provides reinforcing means to the strip resistant to deflection thereof. If desired, as in the modified form, the strip may be provided with ventilating perforations. This provision attains importance where the injured body appendant requires poultice or aeration treatment, as well as immobilization. Further the strip has an end projection or tab by which the splint applicator may manually grasp and manipulate the splint during application or removal.

The means for mounting the strip is embodied in a plurality of tongues. The tongues are integral with the strip and originate at spaced points along one of the side edges of the strip. The tongues extend in parallel relation to each other from said edge of origination toward and to the opposite side edge of the strip to locate their free ends in overlapping and contacting relation with a surface of the strip. In extending from one strip edge to the other, the tongues span the arc of strip contour mentioned to form, with the strip, a port or path of insertion for the injured body appendant. The tongues form, when viewed in this light, bands of uninterrupted continuity which, due to the flexible characteristic of the material from which formed, are individually self-adjustable in dimension to fit the body appendant and its swellings or protuberances. Preferably, the tongues extend arcuately from strip edge to strip edge and form a plurality of axially spaced annuli having some of



the characteristics of a part of the medieval Chinese finger manacle, that is, ease of appendant insertion and resistance to withdrawal.

The embodiments shown may be used as shown in Fig. 1 with bandage or in some cases without, the tongue ends being lockable, if desired, to the strip by an adhesive tape extending lengthwise of the strip.

Now referring to the structures shown in the drawing, the fixing splint has a bracing batten strip 10. As will be observed from Fig. 4 of the drawing, the strip 10 is of arcuate contour when viewed endwise. The strip 10 has a straight side edge 11 which extends parallel to the line of longitudinal dimension of the strip and another and opposite side edge 12. Extending from one end of the strip 10 is an extension 14. The extension 14 provides a tab by means of which the splint may be manually grasped and manipulated. Preferably, the strip 10 has a ridge-like bead 15 extending thereacross. The bead 15 serves to reinforce the strip against deflection. The bead 15 preferably extends lengthwise of the strip and through a zone medial to the side edges 11 and 12 thereof as shown in Fig. 2 of the drawing. Further, the bead 15, as shown in Fig. 4, protrudes outwardly of the strip for reasons hereinafter mentioned.

If desired, the strip 10 may be provided with a plurality of perforations 16 as incorporated in the modified form illustrated in Fig. 5 of the drawing. The perforations 16 allow communication through the strip for purposes previously mentioned.

The means for mounting the strip 10 comprises a plurality of tongues 20. The tongues are integral with the strip 10, originating at spaced points along the side edge 12 thereof. As shown, each tongue 20 extends toward and to the edge 11 of the strip to locate the free tip or end 21 thereof in contact with a surface of the strip 12. Preferably, the tongues extend arcuately across the arcuate span between the side edges 11 and 12 to form, as viewed in Fig. 4, annular bands approximating the contour and dimension of the body appendant of proposed application.

In use, the illustrated splint grasped by the applicator by seizure of extension tab 14 is positioned allowing the injured body appendant, such as the finger digit 30 shown in Fig. 1, to be inserted axially into the generally cylindrical space defined by tongues 20 and strip 10. The flexible elasticity of the tongues 20 allow the appendant 30 and such dressing 31 as may be applied thereto to pass. Upon the passage completion, the tongues 20 self-adjust themselves to clasp the appendant and hold the strip 10 in lateral batten bracing relation to the appendant. If desired a tape of adhesive material (not shown) may be laid lengthwise of the strip 10 to engage successively disposed tongue ends 21 and the strip, thereby locking the tongues against moving. A covering wrapping may be then applied, if desired.

The material from which the splint is formed and the thickness thereof at the base of each tongue 20 is such that by use of household shears, a tongue 20 may be cut away from the strip 10. Thus, the user, requiring larger open zones between adjacent tongues than that shown in the drawing, may cut certain, such as alternate, tongues 20 at their root line to easily modify the splint to a particular use.

The ridge-like bead 15 which reinforces the strip 10 also is adapted to engage the end edges

of the tongue tips 21 when the tongues are drawn beyond a certain predetermined degree of constriction. Thus, the bead 15 serves to limit the constriction of the tongues to that degree of constriction which is short of producing undesired pressure on the injured body appendant.

While I have illustrated and described the best forms of my invention now known to me, as required by the statutes, those skilled in the art will readily understand that changes may be made in the disclosed construction without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. A fixing splint for application to an injured body appendant comprising a strip of limitedly flexible sheet material adapted to batten-brace an injured body appendant; the strip being arcuate in cross section; the strip having a plurality of arcuate tongues originating at points along but one side edge of the strip spaced distances from each other approximately that of the width of an adjacent tongue; each tongue extending from said strip side edge to the opposite side edge of the strip with the free end of the tongue in overlapping relation and surface contact with a surface of the strip whereby said tongues form, with the strip, a plurality of spaced flexible bands of individually self-adjustable dimension and uninterrupted continuity in contour with that of the strip adapted for circuitously engaging an injured body appendant at spaced zones to support the strip in a desired position of batten-bracing on such injured body appendant.

2. A fixing splint for application to an injured body appendant comprising a strip of sheet-like material having an arcuate contour when viewed endwise; the strip having a reinforcing ridge-like bead extending thereacross and projecting radially outward from the arc of strip contour; the strip having a side edge extending parallel to the line of longitudinal dimension of said strip; the strip having integral therewith a plurality of flexible tongues originating at spaced points along only the side edge of the strip opposite to the first named side edge; each tongue extending arcuately across the arcuate span of the strip from the side edge of tongue origination to the first named side edge with the free end of the tongue in overlapping surface engagement with the outer surface of the strip whereby said tongues form, with the strip, a plurality of spaced annuli of individually self-adjustable diameters and uninterrupted continuity adapted for circuitously engaging an injured body appendant at spaced zones to support the strip in a desired position of batten-bracing on an injured body appendant; said strip having an end extension projecting axial wise of and beyond the arcuate tongues and providing means for manually grasping and manipulating the splint.

THOMAS STEVENSON.




## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 471,252 | Hanley | Mar. 22, 1892 |
| 2,273,028 | Eaton | Feb. 17, 1942 |