

Oct. 4, 1949.

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2,483,715

APPARATUS FOR PRODUCING SURGICAL SPLINTS OR CASTS

Original Filed Sept. 23, 1946

Fig. 1

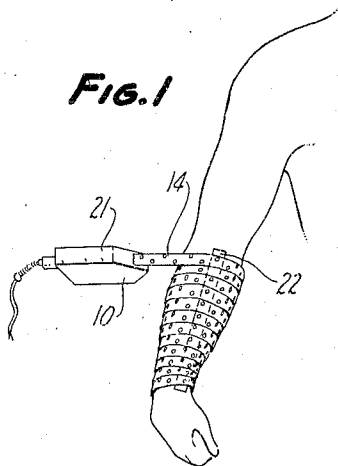


Fig. 2

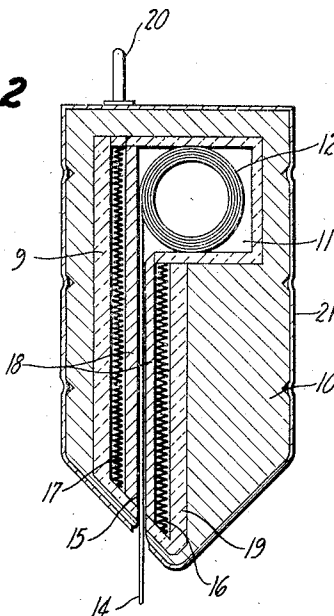
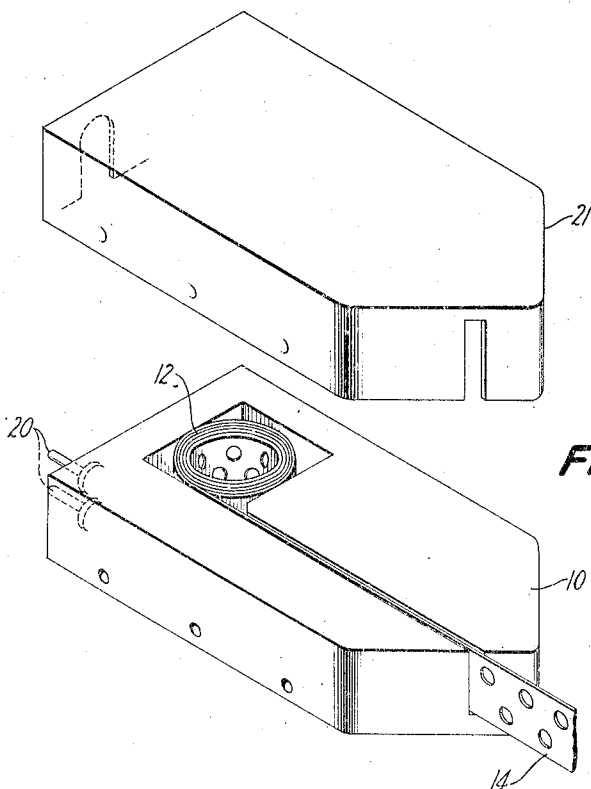


Fig. 3



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2,483,715

APPARATUS FOR PRODUCING SURGICAL
SPLINTS OR CASTS

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Original application September 23, 1946, Serial
No. 698,836. Divided and this application No-
vember 26, 1946, Serial No. 712,273

3 Claims. (Cl. 219-19)

1

This application is a division of my co-pending application entitled "Method for producing surgical splint or cast," filed September 23, 1946, Serial No. 698,836, now abandoned.

This invention relates to the formation of surgical and like splints or casts, and particularly pertains to an apparatus for dispensing a strip of thermoplastic material and applying the same to produce a splint or cast.

In my prior application referred to I have disclosed an improved method and apparatus for expeditiously applying a muscle or bone immobilizing cast or bandage of minimum bulk and extremely light in weight, which bandage will be unaffected by water, conform to body contours, and permit penetration of X-rays.

It is the object of my present invention to provide an improved and exceedingly simple and effective applicator or dispenser, enabling expeditious formation of a rigid cast or splint from a strip of thermoplastic material.

The invention is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a perspective view illustrating the use of the method in forming a splint or cast for the human arm.

Fig. 2 is a longitudinal sectional view through an applicator or dispenser embodying my invention.

Fig. 3 is a perspective view of the applicator or dispenser.

Although herein I disclose my invention as applicable for use in forming rigid surgical splints or casts, I am aware that it is inherently capable of many other non-analogous uses, and the one here disclosed is by way of example only.

In practicing my invention, I prefer to employ a strip of thermoplastic material, such as cellulose acetate, although various other thermoplastics may be used. The plastic is intended to be preformed in a comparatively thin strip, as illustrated in the drawings. This strip is softened by the application of heat thereto immediately prior to its application to form a body splint or cast. The contacting layers of the strip I intend to bond or fuse together by softening of the strip to a tacky state, and by the interposition between the layers of a solvent. In the event cellulose acetate is used as the material, this solvent may be polyhydric alcohol, although any other agent in which the plastic is soluble may be employed.

To effect heating of the strip to soften the same to a pliable condition, I provide an applicator or dispenser such as illustrated in the drawings.

2

This applicator comprises a casing 10 formed of a suitable thermosetting plastic or other suitable material having a chamber 11 formed therein to receive a roll 12 of the strip thermoplastic material 14. The chamber 11 is adjacent one end of the device and there is formed longitudinally of the casing 10 a narrow passageway 15 extending tangentially from the chamber 11 through the opposite end of the casing. This passageway 15 is of a width and depth just sufficient to enable the strip 14 to be drawn longitudinally thereof with the sides of the strip 14 in light contact with the sides of the passageway 15.

At opposite sides of the passageway and along one side of the chamber 11 are electrical resistance elements 16 and 17 which are spaced from the passageway 15 by a suitable thickness of heat conducting material 18. Interposed between the resistance elements 16 and the casing 10 are non-inflammable heat insulating layers 19. The resistance of the elements 16 and 17 is sufficient to generate sufficient heat to soften the plastic strip 14 as the same is continuously withdrawn from the roll 12 through the passageway 15. I intend that the plastic strip 14 be heated to a degree sufficient to render the same tacky and extremely pliable.

I prefer that the strip be perforated, as illustrated in Fig. 3, to form recesses for the reception of a solvent to aid in bonding superposed layers of the material together to form a rigid unitary structure.

The casing is fitted with a conventional form of terminals 20 electrically connected, of course, to the elements 16 and 17 so that current may be led thereto. A removable cover member 21 is provided for the casing 10 to fit thereover and enclose the same.

By way of example, to practice my method in forming a surgical splint or cast, say on the human arm as illustrated, a strip of metal such as aluminum 22 may be laid lengthwise of the arm and then the strip 14 of plastic may be wound spirally over the arm and metallic strip 22, with the convolutions overlapping. As the winding progresses, solvent may be deposited in the perforations between the convolutions to fuse the convolutions together. The convolutions will also be firmly bonded together by the intimate contact between their tacky surfaces so as to form a rigid unitary splint or cast structure when the plastic cools and becomes hard.

If it is desired to remove the cast from the example shown in Fig. 1, a cut is made through the plastic down to the aluminum or metallic

strip 22, enabling the splint or cast to be bivalved and removed from the arm.

Obviously, a splint or cast such as formed by my invention will be unaffected by water in that the plastic is insoluble in water, and, further, will enable the penetration of X-rays, so that the progress of knitting of the bone structure may be frequently determined without removal of the cast.

It is manifest that a cast so formed would be extremely rigid and have considerable strength. Also, it would have but little bulk and be extremely light in weight, thus minimizing the discomfort to the patient.

From the foregoing it is obvious that I have provided a very simple and effective device for applying thermoplastic in strip form to produce an effective splint or cast.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An applicator or dispenser for a thermoplastic strip comprising a casing having a chamber formed therein to receive a roll of plastic strip, said casing having a passageway of dimensions conforming to the dimensions of the strip, said passageway leading from said chamber through one end of the casing, and heating elements adjacent said passageway to create sufficient heat as the strip is drawn through the passageway to soften the same to a pliable condition.

2. An applicator and dispenser for a thermo-

plastic strip comprising a casing having a chamber therein to receive a roll of plastic strip, said casing having a passageway formed therein extending from said chamber through one end of the casing, the dimensions of the passageway conforming to the dimensions of the strip whereby the latter will be in close proximity to the sides of the passageway as it is led from the chamber through the passageway, resistance elements disposed contiguous to the sides of the passageway, the resistance of said elements being such as to sufficiently heat said thermoplastic strip as it passes through the passageway to render the same to a pliable state.

3. An applicator and dispenser for a thermoplastic strip comprising a casing having a chamber therein to rotatably receive a roll of plastic strip, said casing having a passageway therein extending between said chamber and one end of the casing, and heating means mounted in the casing contiguous to the passageway to heat said strip sufficiently during its passage through said passageway so that it will be in a pliable condition as it emerges from the passageway.

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

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