

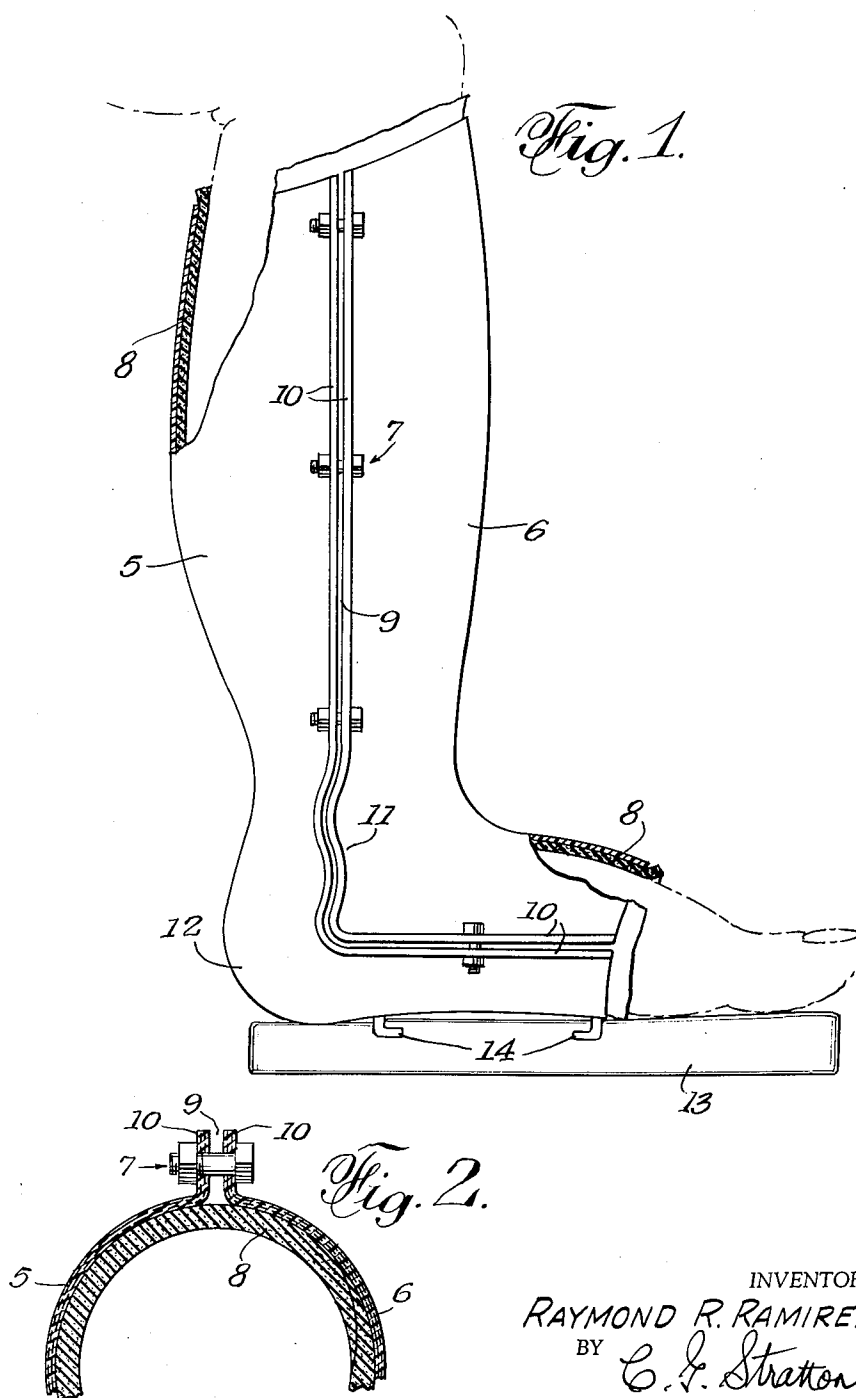
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PRE-FORMED SURGICAL CAST AND METHOD

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3,032,033 PRE-FORMED SURGICAL CAST AND METHOD

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This invention relates to a pre-formed surgical cast and to a method for producing the same.

Protection of fractures of the limbs and other portions of the body is difficult during removal of a person from the scene of the injury and transportation to a hospital or other place where proper surgical aid may be given. Frequently, such fractures are materially aggravated, particularly during manual movement attending placement on and removal from a stretcher. An object of the present invention is to provide a pre-formed surgical cast that may be applied to enclose and effectively support a fractured portion of the body at the scene of the injury and without the need for an undue amount of movement of the body part being encased. A person provided with a cast according to the present invention may then be moved and transported with impunity.

Since the limbs and different parts of the body vary considerably in size and shape, it is contemplated to pre-form such casts in graduated sizes that, at least, approximately fit the body part to which applied, the invention having as another object to provide such casts with fit-compensating compressible liners that, at least temporarily, protect the body part to which applied.

A further object of the invention is to provide a pre-formed sectional cast for the above-outlined purposes, as well as for permanent use until healing is effected and removal indicated. Thus, the invention contemplates a cast that is re-usable.

A still further object of the invention is to provide a novel method for producing sectional casts as above indicated.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows, and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a side elevational view, partly in section, of a surgical cast according to the present invention.

FIG. 2 is an enlarged and fragmentary typical cross-sectional view thereof.

The present invention is illustrated as a cast to enclose the leg, ankle and part of the foot. This, of course, is typical because the cast may be formed to enclose and support the upper leg, an arm in straight or bent position, the neck and such portions of the body as may need support of the spine, and/or rib cage.

In any case, the present cast comprises, generally, a rear section 5, a front section 6, means 7 to separably connect said sections to enclose a part to be supported, and liner means 8 within the hollow of the cast to compensate for such variations as there may be between the cast and a body part to which the cast is applied.

The sections 5 and 6 are separated along a seam 9 that is defined between mating flanges 10 on both sides of each section. As can be seen at 11, said flanges may

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be diverted from a straight path in order to allow the seam to pass over protuberances, such as ankle bones, thereby enabling ready application of the cast sections. Each said section comprises a preferably thin-walled, rigid, hollow member which, depending on the contour of a limb or body part, may have a socket portion or portions 12. The socket portion 12 accommodates a heel, but it will be clear that in an arm cast, for instance, the portion 12 may house an elbow.

The liner means 8 is shown as a wrapping of sponge rubber that is interposed between the cast sections 5 and 6 and the body part enclosed thereby. Said means 8 may have material thickness to provide for proper compensating compression in use. Loosely applied bandages to a desired thickness may be substituted for sponge rubber. The liner may be applied to the body part before the cast is applied, or the same may be cemented in the cast sections first, as desired. In any case, the means 8 will compensate for variations in size and shape between the cast and the part to which applied, and will provide resilient support with reasonable comfort—comfort that should be greater than in an unsupported limb or body part that has been fractured or otherwise hurt. The degree of pressure applied to the liner may be varied according to the take-up on the means 7 which is here shown as bolts to draw the flanges 10 together.

The present cast is produced as follows:

A plaster model, in any of several known ways, is produced from a limb or other part of the body. The outer surface of this model is preferably treated with wax or coated with foil to render said surface non-adhesive. A layer of fiber glass cloth is then applied to the cast, shaping the same to fit around the cast, at the same time forming the flanges 10. Liquid resin—air- or sun-cured—or an epoxy resin, is then applied to the cloth wrapping by brushing or by spraying. The above may be repeated, resin-impregnated layer on layer, until a desired thickness of cast body is attained. Two, three, or four layers (more if necessary) may be used to provide the cast with suitable rigidity, although the light weight inherent in fiber glass will be a desirable property of the cast sections thus formed. The same will be strong, certainly much stronger than plaster casts, and, when applied to enclose a fractured leg, for instance, will provide support that will enable walking thereon.

Walking may be rendered easier by providing the cast with a sole 13 which is shown as carried by hook member 14 affixed to the cast section that is turned beneath the foot. Other ways may be provided for holding a sole in place. The latter is preferably formed of rubber.

Since the cast above provided will pass X-rays, such examination may be made with the cast in place.

While the foregoing specification illustrates and describes what I now contemplate to be the best mode of carrying out my invention, the construction is, of course, subject to modification without departing from the spirit and scope of my invention. Therefore, I do not desire to restrict the invention to the particular form of construction illustrated and described, but desire to cover all modifications that may fall within the scope of the appended claims.

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

1. A surgical cast comprising two pre-formed, rigid and complementary sections of laminated fiber glass for enclosing a portion of a human or animal body, each section having lateral edge flanges and the flanges being arranged as mating, means to separably connect the mating flanges to enclose such body portion, a support part attached to one end of one of the sections and extending forwardly beyond said end and constituting a support

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for the connected sections and for the body part enclosed thereby, said flange connecting means comprising members to pull the mating flanges together and thereby draw the complementary sections together over said enclosed body portion, and a compressible liner interposed between the body portion and the mentioned sections and placed in compression over the body portion when the members of the flange-connecting means pull the mating flanges together.

2. A surgical cast according to claim 1 in which the compressible liner comprises a body portion-encircling tube that is applicable to the body portion before the cast sections are applied, the section flanges being diverted from a straight line disposition to pass over liner-covered high bony projections of the body portion encircled by the liner.

3. A surgical cast according to claim 1 in which the mentioned liner is formed into a tube as a wrapping of sponge rubber of a thickness that, by compression, will

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compensate for variations in height, size and shape between the cast and the body portion to which applied.

References Cited in the file of this patent

UNITED STATES PATENTS

101,743	King	Apr. 12, 1870
224,784	Johnstone	Feb. 24, 1880
2,103,942	Gillin	Dec. 28, 1937
2,189,053	Bryant	Feb. 6, 1940
2,384,804	Anderson	Sept. 18, 1945
2,489,252	Anderson	Nov. 29, 1949
2,761,443	Parker	Sept. 4, 1956
2,786,007	Chew	Mar. 19, 1957
2,800,129	Van Swaay	July 23, 1957
2,853,067	Puharich	Sept. 23, 1958
2,870,793	Bailey	Jan. 27, 1959
2,958,325	Claydon et al.	Nov. 1, 1960