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Lauber et al.

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[45] **Aug. 19, 1975**

[54] **ORTHOPEDIC CAST AND METHOD OF CONSTRUCTING SAME**

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[21] Appl. No.: **437,522**

[52] **U.S. Cl.** ..... **128/91 R**

[51] **Int. Cl.** **A61f 5/04**

[58] **Field of Search** ..... 128/91 R, 90

[56] **References Cited**

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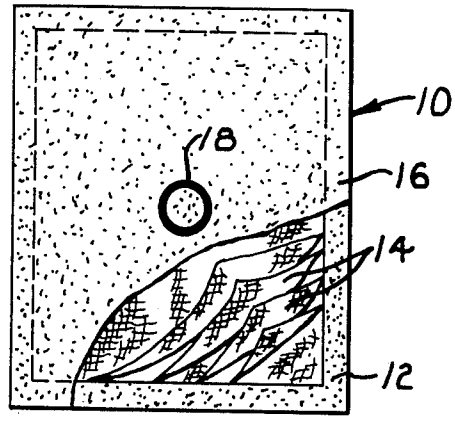
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Attorney, Agent, or Firm—Lowe, Kokjer, Kircher, Wharton & Bowman

[57] **ABSTRACT**

An improved plaster cast and method of preparing it are provided by the present invention. The cast is formed from a casting blank prepared in a novel manner. A first sheet of deformable, water absorptive material is placed on a supporting surface and a plurality of plaster splints are aligned on the sheet. A second sheet of the deformable, water absorptive material is then placed over the first sheet to sandwich the plaster splints between the two sheets. The edges of the sheets are then bonded together to enclose the plaster splints within the deformable, water absorptive material to form the casting blank. When the blank is to be used to form a cast for a portion of the body, it is first saturated with water then shaped around the body portion. The shaped cast is then wrapped with an adhesive or elastic tape to hold it in place while it dries.

5 Claims, 6 Drawing Figures



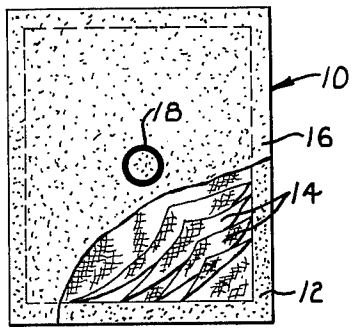


Fig. 1.

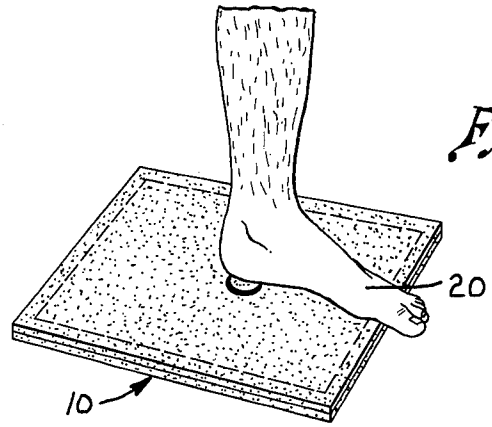


Fig. 2.

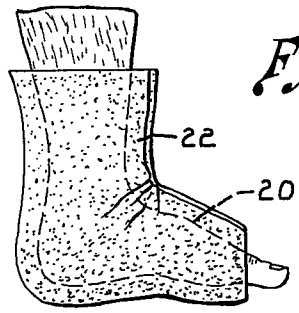
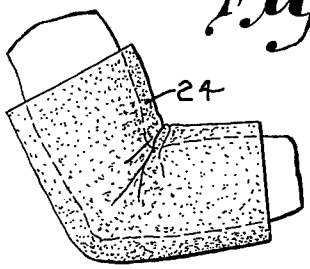


Fig. 3.

Fig. 4.



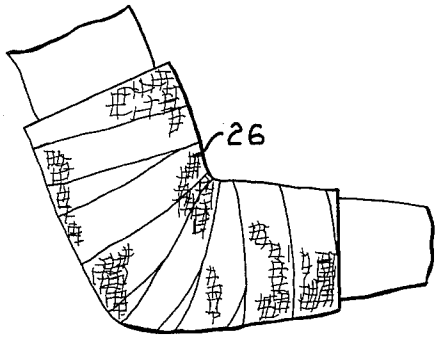


Fig. 5.

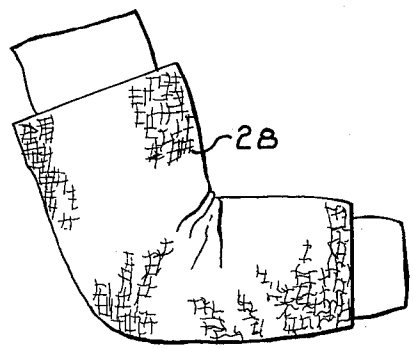


Fig. 6.

ORTHOPEDIC CAST AND METHOD OF CONSTRUCTING SAME

This invention relates generally to orthopedics and more specifically to an improved orthopedic cast and method on constructing same.

Plaster casts have been used in the healing arts for many years to immobilize and hold in place a fractured bone. Construction of a plaster cast is a time consuming procedure requiring a high degree of skill. Normal procedure is for the dry plaster ingredients to be impregnated in a gauze cloth to form what is commonly referred to as a plaster splint. After the fractured bone is set in place, and the attendant portion of the body is covered with a soft cloth, a number of the plaster splints are moistened and carefully wrapped around the body portion. A minimum of six and as many as fifteen or twenty splints are utilized to form a multiple layered immobilizing cost. As each splint must be moistened and then carefully laid over the preceding splint followed by wrapping of the splint around the body portion, this is a very time consuming procedure. The person applying the cast must be very careful to control the amount of moisture applied to the individual splints as too much moisture will weaken the cast and too little moisture will result in non-adherence of the individual splints to each other which also causes a weak spot.

Because of the great amount of time as well as skill that is required to construct a conventional plaster cast, it has been impossible to utilize such casts on an emergency basis to immobilize a broken bone at the scene of an accident. While in many instances such temporary immobilization would greatly facilitate transfer of the patient to a medical center and possibly prevent further and more serious injury, it has not been possible to utilize plaster casts on such an emergency basis.

It is therefore a primary object of the present invention to provide an immobilizing orthopedic cast which can be constructed in a fraction of the time as required for a conventional plaster cast and can therefore be utilized on an emergency and temporary basis at the scene of an accident for facilitating transfer of the patient to a medical center.

As a corollary to the above object, it is an important aim of this invention to provide an immobilizing orthopedic cast which can be constructed by paramedical personnel having a minimal amount of training as compared with the amount of training necessary for a person to be qualified to construct a conventional plaster cast.

It is still another objective of my invention to provide an orthopedic cast which is easier and quicker to construct than a conventional plaster cast and is also more comfortable for the patient to wear because of the incorporation into the cast as an integral part of a resilient layer of material between the rigid plaster and the patient's body.

Still another object of this invention is to provide a method of constructing a cast for permanently setting a fractured bone that is easier for a doctor to utilize because of the elimination of the multiple steps required in building a multiple layered cast from individual splints.

Other objects of the invention will become apparent or be made clear from a reading of the following description and claims in light of the accompanying drawing.

In the drawing:

FIG. 1 is a top plan view with portions broken away of a casting blank constructed according to the present invention for use in the inventive method of constructing a cast;

FIG. 2 is a perspective view illustrating how the casting blank would be placed to form a cast around the ankle and foot;

FIG. 3 is a side elevational view of the ankle and foot shown in FIG. 2 with the casting blank shaped to conform to the shape of this portion of the body;

FIG. 4 is a side elevational view of a portion of the elbow and upper and lower arm of a person encased within a cast constructed according to the teachings of the present invention;

FIG. 5 is a side elevational view, similar to FIG. 4, and illustrating a further step which may be utilized in constructing a cast according to the method of the present invention; and

FIG. 6 is another side view of the arm and elbow shown in FIGS. 4 and 5 with the completed cast thereabout.

Referring initially to FIG. 1, the present invention encompasses a novel casting blank **10** and a method of constructing it. A first sheet **12** of deformable water absorptive resilient material is placed on a working surface and trimmed to an appropriate size. While a cellular material such as foam rubber or urethane foam is preferred because of its high water absorption and resiliency, it will be appreciated that other equivalent materials which are deformable and water absorptive may be utilized. A number of plaster splints **14** are then placed over sheet **12** in general alignment with the latter. Each splint **14** is of a construction well known to those skilled in the art and normally comprises a layer of gauze cloth impregnated with the dry plaster ingredients. It is to be understood, however, that the term "plaster splint" as used in this application is intended to include any plaster-like material which will harden after water has been added, impregnated in a carrier such as the gauze cloth. While it is much preferred to utilize the plaster splints **14**, for some applications it is possible to utilize the dry plaster ingredients without the cloth carrier strips.

The number of plaster splints **14** may also be varied in accordance with the requirements for the particular cast being constructed. For most applications at least six of the splints **14** will be required to give the necessary support and additional splints may be utilized as needed.

A second sheet **16** of the same water absorptive deformable material as the first sheet **12** is trimmed to the appropriate size and placed over the splints **14** on the first sheet. The sheets **12** and **16** are each of a size such that they present a surface area larger than the surface area of the splints **14** so that the edges of the sheets extend beyond the edges of the splints.

Next, the edges of sheets **12** and **16** are joined together preferably through use of a suitable adhesive. The completed casting blank **10** will thus comprise upper and lower layers of a resilient deformable water absorptive material with a quantity of plaster sandwiched between the two layers. It has been found helpful to provide a centering ring **18** imprinted on the surface of one of the sheets to facilitate centering of a portion of the body such as foot **20** to be enclosed within the cast formed from blank **10**.

When a cast is to be constructed from blank **10**, the latter is saturated with water to activate the chemical reaction that will harden the plaster. Because splints **14** are enclosed within sheets **12** and **16**, the amount of water utilized is easier to control. Generally, by submerging blank **10** for from **20** to **40** seconds, the sheets **12** and **16** will become saturated and an adequate but not excessive quantity of water is available for splints **14**. Excess water is drained and pressed from blank **10** before the latter is moved into position for shaping around foot **20**. The blank is shaped around the foot to conform to the shape of the latter by folding and "kneading" it into place. The completed cast as illustrated in FIG. **3** and designated by the numeral **22** will normally harden in *10* minutes or less although this time may be accelerated by the application of warm air.

The blank **10** is illustrated in FIG. **3** shaped into an elbow cast **24**. It will generally be preferred for a cast formed from blank **10** to be wrapped with tape **26** to hold the cast in place while it is drying. Tape **26** may be an inelastic adhesive type or may comprise an elastic material commonly referred to as an elastic bandage. The tape remains in place after the plaster cast hardens and provides some additional support for the cast as well as a degree of protection against damage. As a final dressing for the cast, a stockinette **28** may be pulled over the tape **26**. Manifestly, stockinette **28** may be easily removed and washed as required.

While the foregoing method has been described with particular reference to use of a cast in immobilizing a fractured bone, the economy and simplicity of a cast constructed according to the present invention makes it readily usable in the lumbar and abdominal regions for support purposes. After the cast has hardened, it may be cut into for examination of the injured area and then replaced by wrapping tightly with tape.

Having thus described the invention, I claim;

1. A method of constructing a casting blank from which a plaster cast for a portion of the body may be formed, said method comprising: providing a first, outermost sheet of resilient, cellular water absorptive material; deposting at least one plaster splint on said sheet; providing a second outermost sheet of deformable water absorptive material; placing said second sheet in overlying relationship to the plaster on the first sheet; and joining the peripheral edges of said first and second sheets to encase said plaster therewithin.

2. A method as set forth in claim **1**, wherein said depositing step comprises depositing a plurality of said plaster splints on said first sheet.

3. A casting blank for use in forming a plaster cast for a portion of the body, said blank comprising:

a first outermost sheet of resilient cellular, substantially non-extensible deformable, water absorptive material;

a layer of plastic material disposed on said first sheet; and

a second outermost sheet of deformable, water absorptive material disposed in overlying relationship to said plaster material to sandwich the latter between said first and second sheets,

said first and second sheets being joined together at their peripheral edges to enclose said plaster material therewithin.

4. The invention of claim **3**, wherein said layer of plaster material comprises a plurality of plaster splints.

5. The invention of claim **4**, wherein said first and second sheets are bonded together.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

atent No. 3,900,024 Dated August 19, 1975

nventor(s) Leo E. Lauber and Ernest A. Cowden

It is certified that error appears in the above-identified patent nd that said Letters Patent are hereby corrected as shown below:

Col. 4 line 21, please delete "plastic" and substitute "plaster".

Signed and Sealed this

ninth Day of *December 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks