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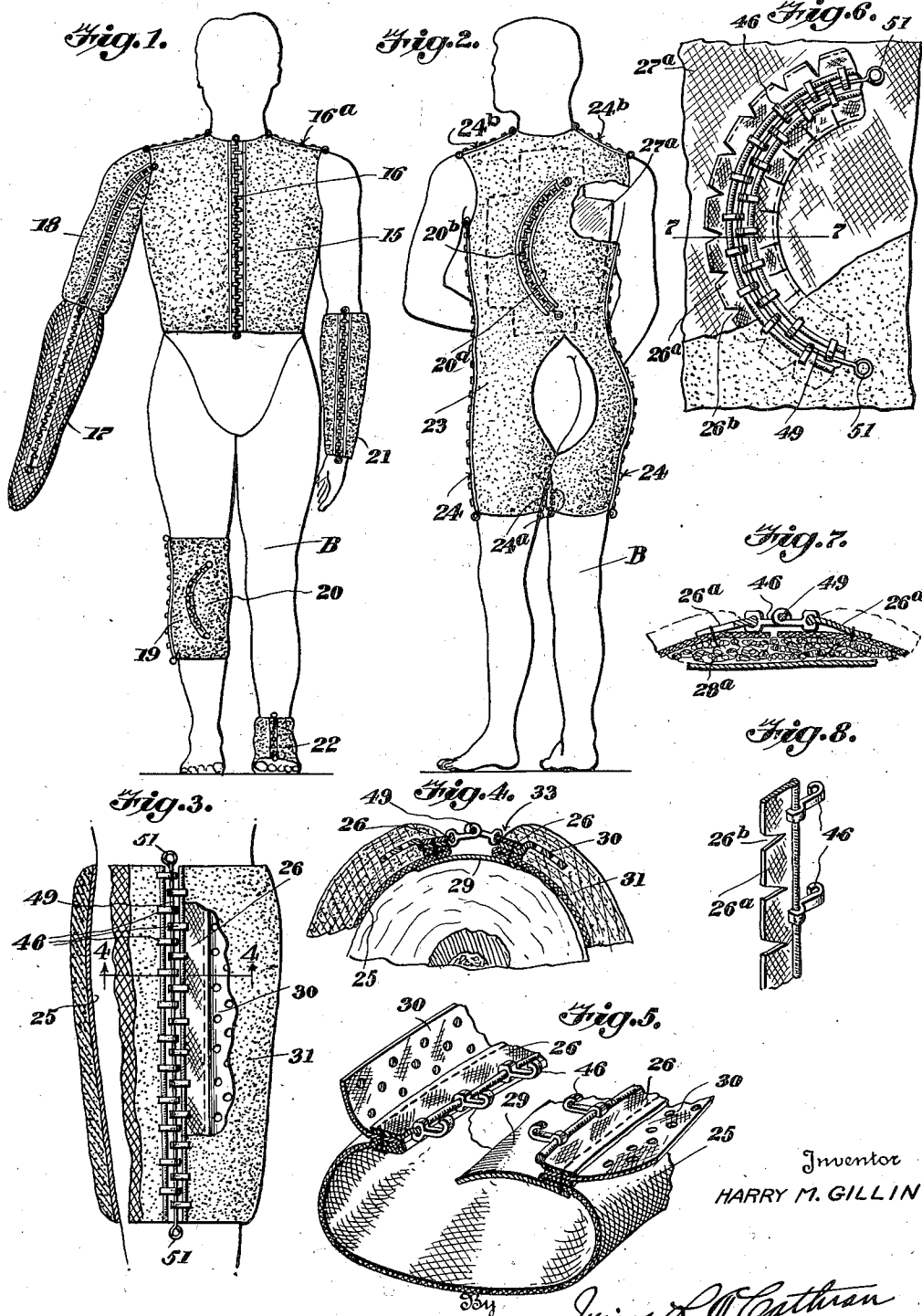
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DETACHABLE PLASTER CAST

Filed Jan. 30, 1936

2 Sheets-Sheet 1



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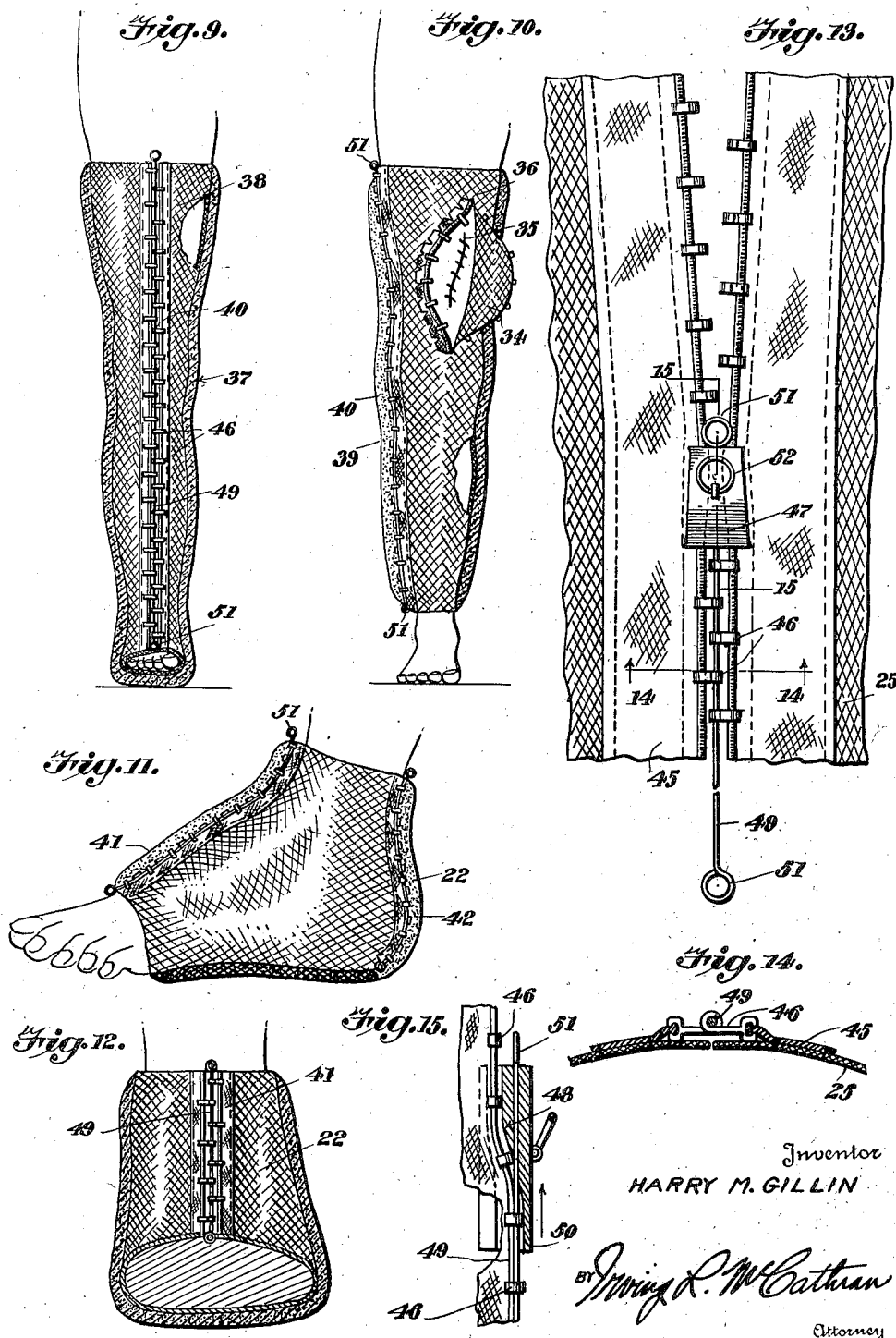
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UNITED STATES PATENT OFFICE

2,103,942

DETACHABLE PLASTER CAST

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5 Claims. (Cl. 128—91)

This invention relates to detachable plaster casts for the human body, and has for its primary object the production of a simple and efficient means for securely fastening a plaster cast around a selected portion of the human body in such a manner as to efficiently support and brace that part of the body surrounded by the cast, and at the same time permit the cast to be readily removed when desired.

A further object of this invention is the production of a simple and efficient detachable plaster cast for the human body and the like, having a separable fastener or securing means extending throughout substantially the entire length thereof, whereby the lining may be spread flat prior to being placed around a selected portion of the human body and may then be drawn around the affected parts and secured through the medium of the separable or similar fastener and a plastic applied about the lining to dry, such fastener or fastening means also permitting the cast to be readily opened throughout its entire length or substantially its entire length, and the body of the cast moved away from the affected parts of the human body and thereby easily detached.

A still further object of this invention is the production of a simple and efficient structure in the nature of a fabric lining and anchoring means whereby the plastic material forming a part of the detachable plaster cast may be firmly anchored in engagement with the fabric portions of the cast.

Another object of this invention is the production of a simple and efficient method for applying a detachable plaster cast to the affected parts of a human body.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawings:

Figure 1 is a diagrammatic view of a human body showing various typical casts applied thereto;

Figure 2 is a perspective view of the body cast shown in place upon a human body;

Figure 3 is an enlarged front elevation of a detachable plaster cast designed particularly for use upon the forearm of the human body, certain portions of the cast being broken away and shown in section;

Figure 4 is an enlarged transverse sectional view taken on line 4—4 of Figure 3;

Figure 5 is a sectional perspective view of a portion of the fabric lining, anchoring strips and

separable fastening elements used in conjunction with the detachable plaster cast;

Figure 6 is an enlarged front elevation of the closure flap used for permitting access to an incision or other wound dressing;

Figure 7 is a transverse section taken on line 7—7 of Figure 6;

Figure 8 is a detail perspective view of one of the hook supporting strips used in connection with the improved cast;

Figure 9 is a vertical sectional view through the plaster portion of the detachable cast, the inner lining and fastening means being shown in front elevation, this view illustrating the type of cast used for a combination leg and foot cast;

Figure 10 is a vertical sectional view through a different type cast and illustrating more particularly the type of cast which is provided with a closure flap to permit access to an incision or other wound dressing;

Figure 11 is a sectional view through the plaster portion of a foot cast, the fabric lining being shown in elevation;

Figure 12 is a transverse sectional view of the type of cast illustrated in Figure 11;

Figure 13 is a front elevation of the separable fastener in the nature of a wire and hook fastening means;

Figure 14 is a transverse section taken on line 14—14 of Figure 13; and

Figure 15 is a vertical sectional view of the slider member of the separable fastener.

By referring to the drawings, it will be seen that B designates the human body, upon which the detachable and sectional plaster casts are adapted to fit, and it is desired to point out that the casts may be variously designed to fit the particular portion of the body as may be required, without departing from the spirit of the invention.

One of the important features to be borne in mind is the location of the separable fastener, or other similar fastener, in a proper position to permit the cast to be easily applied as well as easily and conveniently removed. By way of illustration, it will be seen by considering Figure 1 that a body cast 15 is illustrated which may be provided with a longitudinally extending separable fastener 16 of any suitable or desired type extending from one end to the other and preferably down through the center front portion of the cast and suitable separable fasteners may be located so as to permit the body cast 15 to be easily placed around the upper portion of the body and over the shoulders, as at 16a, and also allow the cast to be readily separated or

opened for the purpose of removal. For the purpose of illustration, I have also shown a forearm portion 17 and the upper arm portion 18, the forearm portion 17 also being designed to extend over the hand. I have also illustrated a leg cast 19 of the type to fit over the knee joint having a flap portion 20 which is typical of a structure which is described in the following. A forearm cast 21 is also illustrated which is of the type to extend from approximately the elbow to the wrist. A foot cast 22 is illustrated, and as stated above these casts may be suitably designed to fit the desired parts without departing from the spirit of the invention, and is each provided with separable fasteners to facilitate the placing and the removal of the casts.

I have shown a full body garment cast 23 having longitudinal separable seam shoulder fasteners 24b, whereby the entire body garment cast 23 may be easily placed upon the body as well as easily removed therefrom. A flap 20a is illustrated, the edges of which are secured by a separable fastener 20b, to permit access to an incision or other wound under the cast 23. When the flap 20 or 20a is released, it may be forced upwardly to permit access to the wound or incision and while the plaster may crack to some extent between ends of the flap, it will serve very effectively to hold a dressing in place when again secured.

Structurally, the various casts embody or consist of preferably a knit or other fabric garment or lining 25, designed to fit snugly around or over the selected portion of the human body, and along the longitudinal edges of the garment or lining 25 are secured the parallel locking portions 26 of the separable fastener, which parallel portions 26 are adapted to be engaged by the locking slide or slider 47, to be hereinafter described. A sealing tongue 29 is preferably secured along one marginal edge of the lining or garment 25, as shown particularly in Figure 5, and is adapted to span the distance between the adjoining longitudinal edges of the lining 25 and constitute a seal for this longitudinal opening which is defined by the parallel portions 26 of the separable fastener. I also preferably employ longitudinally extending perforated anchoring webs 30 which are secured near the marginal edges of the lining 25 and extend laterally away from the separable fastener toward the sides of the lining 25. Plastic material of the usual type, such as plaster of Paris, and the like, indicated by the numeral 31, is applied to the lining 25 in a manner as shown in Figure 4, so as to cause the perforated anchoring webs 30 to be embedded within this material 31, as shown in Figure 4, the plastic material being shaped to overhang the marginal edges of the lining 25 and being terminated short of the inner locking portions of the parallel portions or sections of the separable fastener to allow the slider 47 to freely operate.

In applying the detachable plaster cast to a portion of the human body, there may be provided, if desired, a cotton packing and suitable splints may also be employed as is now usual with the profession and as occasion may require, but ordinarily the cast is adapted to fit skin-tight without the use of packing or splints. The knit or fabric lining is then brought snugly around the affected part of the body and the ends of the separable fastener are secured, and the separable fastener is then operated so as to close and draw the marginal edges of the lining in a tightly

bound position. The plastic material 31 is then applied to the lining 25 to form an encircling plastic covering such as is shown in Figure 2, the anchoring webs 30 being embedded to firmly support the marginal edges of the lining in engagement with the plastic covering 31, and also firmly hold the parallel portions 26 of the separable fastener.

In following out the method of procedure above described, it will be seen that as the plastic material 31 hardens, a very rigid cast will be provided and the separable fastener slide 47 will be located in a longitudinally extending channel 33 formed upon the outer face of the cast and located in a position whereby, when it is desired to remove the cast, this may be easily accomplished by merely pulling out the wire 49 hereafter described. This will open the cast from end to end throughout the entire length of the cast, note the form shown in Figure 3 and in certain other forms, substantially throughout the entire length of the cast, whereby the cast may be spread open and easily removed by sliding it longitudinally off the arm or leg or by grasping it by its marginal portions and applying force to spread the cast a sufficient distance to permit removing it laterally from the arm or leg. While the plaster may be cracked somewhat in spreading the cast, the fabric lining will hold the major portion of the plaster in place and the cast can be replaced and again secured to act as a shield after a bone has knitted.

Through the medium of the present device, a detachable plaster cast is provided which will not only efficiently brace, support and protect the affected parts of the body, but will at the same time be quite comfortable to the wearer, as well as being easy to apply and easy to remove. In some instances, it is necessary that the cast be provided with means to permit access to an incision or to other affected parts of the body, and for this reason I provide a flap such as is indicated by the numeral 20 in Figure 1, and as also indicated by the numeral 20a in Figure 2, and by the numeral 34 in Figure 10. This flap may be provided with a suitable separable fastener 35 along its marginal edge to permit the securing of the edge of the flap in a closed position and at the same time allow the flap to be open for the purpose of dressing the wound or inspecting the incision. The edge of the flap may be variously designed, but it is preferably of an irregular arc-shaped contour, as shown in Figure 10, so as to allow the flap to be swung away from the incision or outwardly when the slide 36 of the separable fastener has been moved to an open position.

In the type of structure shown in Figure 9, there is illustrated a removable or detachable plaster cast 37 having the separable fastener 38 extending longitudinally thereof down the front face and over a portion of the top of the foot. In Figure 10, the cast 39 is provided with a separable fastener 40 extending down one side. In the foot cast 22, shown in Figures 11 and 12, the separable fastener 41 is preferably located longitudinally and centrally of the upper face of the foot and a separable fastener 42 is preferably located vertically of the back of the foot from a point near the lower extremity of the heel to the upper edge near the ankle. As stated above, these separable fasteners may be located at any suitable or desired position to facilitate the application and the removal of the cast.

As shown in Figure 6, the separable fastener

illustrated for the purpose of permitting access to an incision and the like, is preferably carried by web portions or tapes 26a, which are provided with V-shaped notched 26b along their outer edges to allow the tapes or web portions to be shaped to the arc of a circle and lie flat or snugly on the supporting fabric.

In applying this flat structure particularly illustrated in detail in Figure 6, it is preferable to sew the tapes 26a to a layer of dry plastic gauze or bandage. An opening is cut in the bandage between the tapes the length thereof and the flap is preferably formed upon a patch of dry powdered plastic bandage, such as is illustrated in Figure 2 and indicated by the numeral 27a. This dry powdered plastic bandage is laid on the piece of fabric lying over the cotton packed incision, the cotton packing being indicated as at 28a in Figure 7. After the patch 27a has been dipped in water the physician preparing the cast will cement the patch to the cast as he applies the plaster in the manner to suit his own convenience or as the necessity of the case in hand demands. As the patch 27a dries, it becomes hardened and forms part of the cast. The arc-shaped opening which is closed through the medium of the separable fastener hereinafter described, may be opened by cutting the wire and forcing the flap upwardly and may be closed again by inserting another wire.

While it is not desired to necessarily limit the present invention to the particular type of separable fastener illustrated, it has been found advisable to employ the particular type of separable fastener illustrated and described in detail in the following. However, it should be understood that other types of separable fasteners such for instance as the hookless fastener may be employed without departing from the spirit of the invention. The type of fastener illustrated in this application, however, has been found much more advantageous due to the fact that the wire may be completely removed and replaced and at the same time avoid the possibility of clogging the various elements of the hookless fasteners with the plastic material which might interfere with the proper operation.

In Figures 13, 14 and 15, there is shown a type of separable fastener which may be used in connection with the present invention consisting of a pair of parallel strips 45, which strips carry alternately arranged inwardly extending hook members 46. A slider 47 is slidably mounted along the parallel portions 45, and is provided with curved channels 48 which are adapted to be moved into overhanging positions such as are shown in Figure 13, as the slider 47 is moved in the direction of the arrows shown in Figure 13. A locking wire 49 is carried by the slider 47 and as the hooks 46 move into the outwardly curved and lower end of the slot indicated by the numeral 50, the hooks 46 engage the wire 49 and thereby hold the parallel portions 45 in anchored relation. The wire 49 is preferably provided with eyelets 51 at its respective ends to prevent the wire from pulling out

of position and when it is desired to release the fastener, one of the eyelets may be cut off and the wire 49 may be pulled longitudinally completely releasing the same from the hooks 46. The slider 47 may be provided with an operating link or ring 52 to facilitate the moving of the slider 47.

While it is preferable to employ the slider 47, it should be understood that the wire, if necessary, might be threaded between the hooks manually by the physician or person preparing the cast, merely by drawing the hooks into proper alignment and inserting the wire therethrough. It is preferable to employ a slider 47 of proper design to cause the hooks to be properly drawn together and to then engage the wire 49.

Having described the invention, what is claimed as new is:

1. A cast of the class described comprising a body having a slit formed therein, a separable fastening means secured around the marginal edges of the slit and formed to provide a movable flap to permit access under the cast.

2. A cast of the class described comprising a body having a curved slit formed therein, a separable fastening means secured around the marginal edges of the curved slit and formed to provide a movable flap to permit access under the cast.

3. A cast of the class described comprising a lining, means for facilitating access to an incision under the cast when formed, said means comprising a patch consisting of a fabric body impregnated with dry plastic material adapted to be moistened for adhering to the fabric of the cast and the plastic material as it is built-up around the patch, the cast having a slot formed by a marginal edge of the patch, and a separable fastener for closing the slot.

4. A cast of the class described comprising a lining, means for facilitating access to an incision under the cast when formed, said means comprising a patch consisting of a fabric body impregnated with dry plastic material adapted to be moistened for adhering to the fabric of the cast and the plastic material as it is built-up around the patch, the cast having an arc-shaped slot formed by a marginal edge of the patch and a separable fastener spanning the slot to facilitate the opening and closing thereof whereby access may be had to an incision under the cast without the necessity of removing the cast.

5. As a new article of manufacture, a lining for a plaster cast formed of fabric and having spaced marginal edges defining a longitudinally extending slit, a sealing tongue secured along one marginal edge of the lining and of a width adapting it to extend across the slit, anchoring strips extending along marginal edges of the lining and attached thereto and having free portions extending from the margins in overlying relation to the lining and adapted to be embedded in plaster applied to the lining, and interengaging fastener means extending along the length of the slit and attached to marginal edge thereof.

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