

Oct. 14, 1958

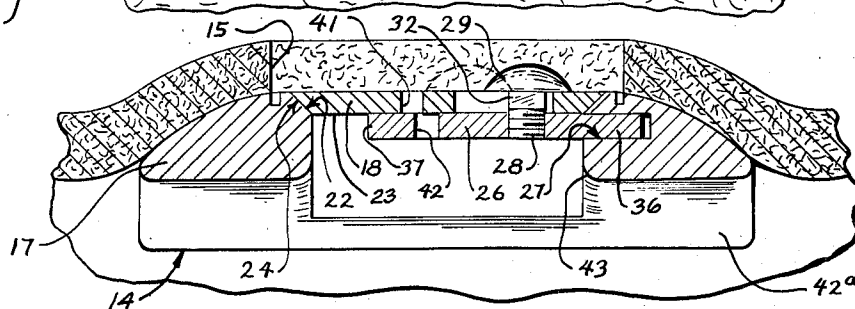
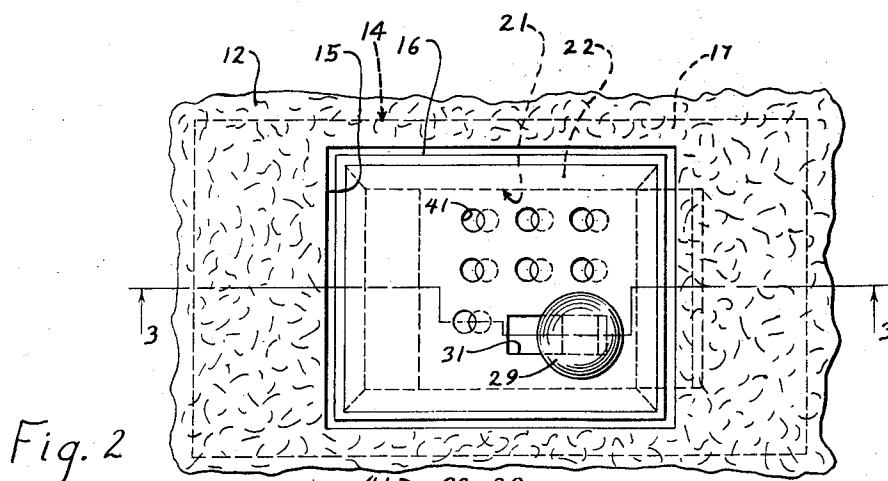
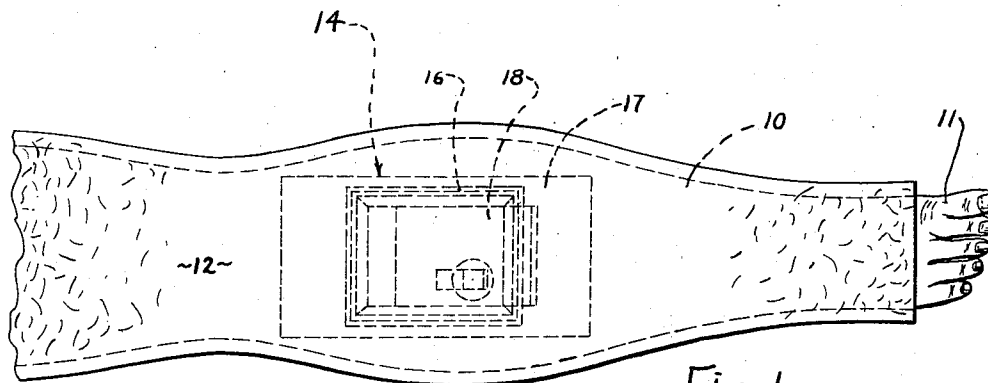
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2,855,922

WINDOWS FOR SURGICAL CASTS

Filed June 3, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

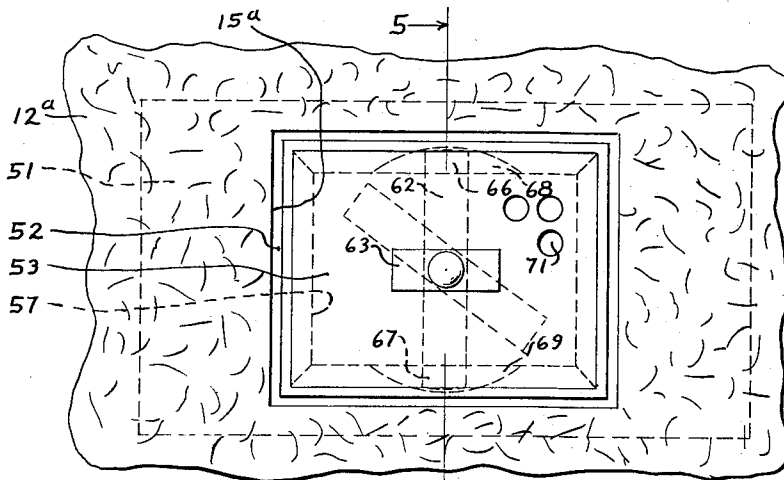


Fig. 4

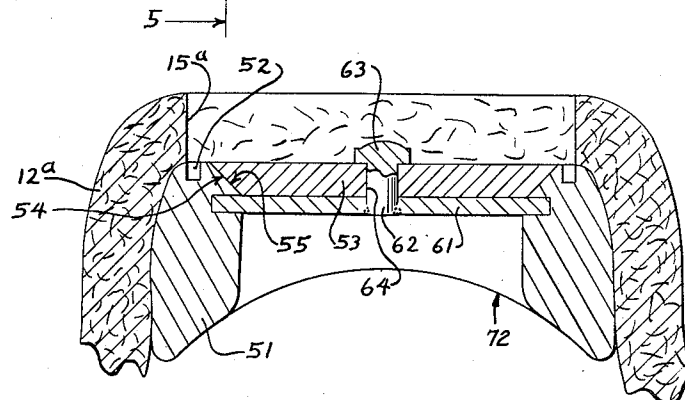


Fig. 5

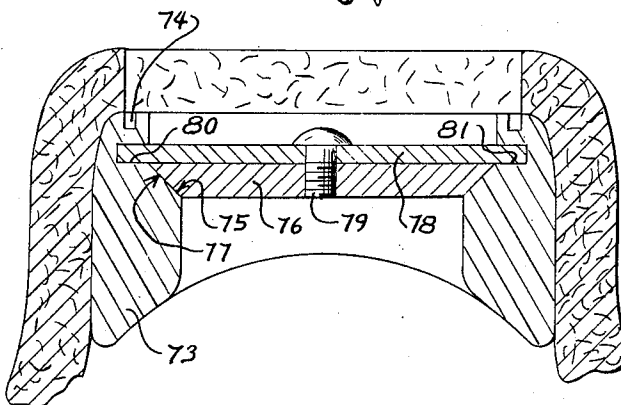


Fig. 6

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WINDOWS FOR SURGICAL CASTS

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Application June 3, 1954, Serial No. 434,117

9 Claims. (Cl. 128—91)

The present invention relates to a surgical plaster cast, and, more particularly, it relates to a means for gaining access from time to time to a part of the patient's body enclosed by the cast.

In certain types of surgical cases where a cast is placed upon a person's body, it is required that the cast be cut to permit access to the patient's body for treatment of an incision or the like. Heretofore, the conventional manner of opening a cast has been a tedious task of cautiously cutting the cast down to the dressed wound on the body. This is a very precarious and exhausting job for both the doctor and the patient.

An object of this invention is to provide a surgical cast which can be readily and easily opened for purposes of treating a wound on the patient's body.

Another object is to provide a surgical cast with an opening to the patient's body whereby said opening can be covered and uncovered as desired.

Still another object is to provide a surgical cast with a removable cover located over an access opening in said cast whereby said cover rigidly supports the edges of said opening when it is positioned on said cast.

Still a further object of this invention is to provide a surgical cast with a removable cover which permits ventilation of the area of the patient's body below said cover.

A further object is to provide a method of treating a compound fracture or the like involving a plaster cast for maintaining the parts in position while affording easy and repeated access to the wound, and ventilation thereof, without impairing the protection provided by the cast.

A further object is to provide a method of making such a cast.

Other objects and advantages will become more apparent from reading the following description in the light of the accompanying drawings, in which,

Fig. 1 is a view of a patient's leg enclosed in a surgical cast containing the structure of this invention.

Fig. 2 is an enlarged view of a portion of the view of Fig. 1 but with the desired opening cut into the surgical cast.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a view similar to Fig. 2 of a modified structure embodying the invention.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a similar view of a further modified construction.

Similar reference numerals refer to similar parts throughout the several views, and it is to be understood that the invention is not intended to be limited to the construction disclosed, or in fact in any manner except as herein set forth and defined by the claims.

In Fig. 1 there is shown in dotted lines a leg 10, and in full lines a foot 11 of a patient. The leg 10 is completely enclosed by a surgical cast 12 which was formed upon or about the leg 10 by the usual method of wrapping plaster treated gauze thereabout, and which sets to

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form a rigid cast in the usual manner. Also shown in Fig. 1, in dotted lines, is a structure generally designated as 14 which embodies this invention.

In the case of the patient's leg shown herein, it is assumed that the leg 10 has suffered a compound fracture causing the flesh of the leg to be cut in the vicinity of the shin. To permit proper treatment of the flesh, it is necessary that the attending doctor have access thereto. Proper access is provided through structure 14 which is placed upon the patient's leg prior to forming the cast therearound. Thus, the structure 14, which may be of any material, preferably light and strong such as a plastic which may be moulded and hardened in well known manner, is placed adjacent or surrounding the cut flesh, which is first covered with the necessary dressings, the cast 12 being wrapped around the leg and over the structure 14 to thereby firmly position the latter on the leg 10 and underneath the cast 12. Structure 14 protects the cut portion from undue pressure, contamination etc. while the cast is being formed.

As hereinbefore stated, an important feature of this invention is to permit easy access to the cut flesh on leg 10. To this end cast 12 can be cut, forming an opening 15 whose margins extend transversely along a rectangular channel 16 provided in the top surface of a frame 17 of structure 14. It will be noted, particularly in Fig. 2, that channel 16 substantially provides the boundaries of access opening 15 through the cast 12 and to the leg 10. Fig. 2 then shows the cast with a rectangular section removed, and it is to be noted that the groove 16 acts as an integral guide for any instrument used for cutting the cast, being readily located when the cutting is started, and facilitating a clean cut of substantially the exact size desired for best results.

A removable cover 18 is also shown to conform approximately to the shape of channel 16 and the opening in frame 17 so that, when a piece of the cast conforming to the shape of channel 16 is removed, a substantially similar opening to the cut flesh is provided by the act of removing cover 18. Cover 18 in the present instance is nested within frame 17 which has an opening 21 extending therethrough and a bevel 22 extending around the upper edge of the section of the frame defining opening 21. The cover 18 is provided on the outer edge of its bottom surface 23 with a bevel 24 which matches bevel 22 of frame 17. When the cover 18 is then placed in position on frame 17, it nests therewith as the respective bevel edges are in juxtaposition. The cover 18 is then maintained upwardly against any further movement downwardly into opening 21.

To secure the cover 18 in a locked position on frame 17, a lower plate 26 is slidably attached under the cover 18 to engage a slot 27 in the frame 17, as shown in Fig. 3. Plate 26 is attached to cover 18 by a bolt or similar element 28 which is threaded into, or otherwise connected, to plate 26 with the head 29 positioned above cover 18. A slot 31 is preferably provided in cover 18 to provide for lateral movement of the shank 32 of bolt 28 to extend plate 26 beyond the end of cover 18 into slot 27 as seen in Fig. 3. Bolt head 29 is, of course, of greater diametrical dimension than the width of slot 31 so that cover 18 and plate 26 form an assembled removable door in frame 17. It is further preferred that bolt shank 32 be formed square in its transverse section as seen in dotted lines in Fig. 2, thus providing a means for maintaining alignment of plate 26 with cover 18 so the plate will not be rotated out of alignment.

In securing the door assembly in frame 17, it should then be apparent that plate 26 is received at one end 36 in the slot 27. This relation is preferably relatively snug so that there will be only a minimum and to all practical intents, no movement of the cover 18 in a direction away

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from frame 17. To remove the cover 18 from frame 17 it is merely necessary to slide plate 26 out of slot 27 by sliding bolt 28 along slot 31 to the dotted position shown in Fig. 3. Plate 26 has then likewise been moved to its dotted position to where edge 37 abuts the side of opening 21. The cover 18 and plate 26 are then free to be removed from the frame 17 through the opening 15 in cast 12.

A further feature of cover 18 and plate 26 is the provision of a plurality of ventilation holes 41 extending therethrough which register in certain positions with holes 42 in plate 26. It is preferred that the holes in cover 18 align with the holes 42 in plate 26 when the latter is locked part way into groove 27, as shown in Fig. 3, but, when plate 26 is in groove 27 to its maximum possible extent, pass beyond registration so that the openings are closed. In this way it is possible to have cover 18 locked in place with openings 41 open or closed as desired. Thus it might be best to have the openings closed while the cast is being formed but to have them open after the section has been cut out of the cast to form the opening 15. This is possible in the disclosed structure; since the holes are fully open during disengaging movement of plate 26 before the latter is fully disengaged from slot 27.

It is also preferred that the frame 17 be shaped to conform to the curvature of a patient's limb. Thus, for the frame 17, as shown in these drawings, to be applied to a leg, Fig. 3 shows an arcuate lower surface 42^a curved in one direction to snugly contact the patient's leg. Also, the corners of frame 17 in contact with the leg 10 should all be round as at 43 to further provide a comfortable fit over the leg.

The device may be provided in various sizes and contours to fit various parts of the body and is readily sterilized and used in a new cast when a previous one has completed its work and been permanently removed.

Various modifications can be made in the construction of the door structure 14 without departing from the scope of this invention.

One such change is that shown in Figs. 4 and 5. Fig. 4 shows the structure of this invention in a manner similar to that shown in Fig. 2 in that it is a plan view of the structure with the rectangular opening 15^a cut into the cast 12^a and the undesired part of the cast removed. This structure is positioned upon the patient's limb in the same manner as previously described. Also, it is held in position by the cast's being formed over it.

The structure consists of a frame 51 which is preferably generally shaped like above mentioned frame 17 except for the locking means. The top surface of the frame 51 is provided with a knife channel or groove 52 which is shown in Fig. 4 to be rectangular across the face of the frame. Formed into a shape corresponding to the rectangle defined by the inside of the channel 52, is a cover 53 which has a beveled edge 54 that fits on a portion of frame 51 that is beveled at 55 from approximately the inside edge of the channel 52 as best shown in Fig. 5.

It should be understood that cover 53 is removable from frame 51 and, when it is so removed, an opening 57, extending through frame 51, is exposed to provide access to the patient's limb from outside the cast 12^a.

To secure the cover 53 onto frame 51, the embodiment of Figs. 4 and 5 shows a latch 61, in the present instance pivotally attached to the underside of cover 53 to extend beyond both sides thereof. A shank 62 is fixed or integral with the latch 61 to extend transversely from the center thereof with a head or cross-bar 63 attached to the opposite end of shank 62. In assembly with cover 53, the shank 62 extends through an opening 64, preferably in the center of the cover to position the latch 61 underneath the head 63 with respect to the cover 53.

The position of latch 61 is then controlled by rotating head 63, and, as seen in Fig. 4, when latch 61 is in

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the dotted position shown, the cover 53 is locked onto the frame 51. It is so locked because the opposite ends 66 and 67 of latch 61 are respectively snugly received within suitably shaped grooves 68 and 69 formed in frame 51. Grooves 68 and 69 are formed in the frame underneath the plane of the cover 53, as seen in Fig. 6, and thereby, through latch 61, hold the cover onto the frame.

It will be apparent that by rotating head 63, and correspondingly latch 61, to the dotted position shown in Fig. 4, the cover 53 is unlocked from frame 51 and free to be lifted therefrom.

Cover 53 may be provided with ventilation holes as 71 or not, as required. Also, the underside 72 of frame 51 is preferably curved to conform to the curvature of the part of a patient's body to which it is to be applied.

Another change is that shown in Fig. 6, in which a frame portion 73 has a guiding means or groove 74 and adjacent thereto an inclined or beveled seat 75 forming the boundaries of an access opening as hereinbefore described, and against which is seated a cover 76 having a beveled under face 77 complementary to surface 75, cover 76 being retained in place by means of a cross piece or latching member 78 outwardly of cover 76 and pivoted on a stud, bolt or similar projection 79. Latching member 78 in one position engages in recesses 80 and 81 at opposite sides or margins of said access opening effectively retaining cover 78 in place on seat 75. It is readily disengaged, however, by turning movement in a manner similar to latching member 67 except that, member 78 being outside of cover 76, may be directly gripped by the fingers or an instrument for turning. It is therefore unnecessary to provide for turning of stud 79 or for fixing it to latch 78. Vent holes in cover 76 may be provided as in the case of prior embodiments if desired.

The foregoing comprising a complete description of illustrative embodiments of the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A surgical cast structure comprising in combination a cast shell disposed about a body member to be treated, a frame embedded in the cast shell having an opening extending therethrough, a surgical cast cutting tool guide located on the face of said frame to substantially outline said frame opening, and a door located on said frame and operable over said frame opening to permit selective opening and closing of said opening.

2. A surgical cast structure comprising in combination a cast shell disposed about a body member to be treated, a rigid frame embedded in the cast shell having an access opening extending transversely therethrough, a surgical cast cutting tool guide integral with said frame to substantially define said access opening therein, a movable closure positioned within said tool guide to permit selective exposing and covering of said access opening, and a latch operable between said frame and said closure to secure the latter upon said frame.

3. An article of manufacture for use with a surgical cast comprising in combination with a cast shell a frame embedded in said shell defining an opening extending through said frame and having a bottom surface for placement upon the body of a person and having a top surface, a surgical cast cutting tool guide integral with said frame on said top surface thereof, a closure fitted over said frame opening within said cutting tool guide, and a latch for securing said closure to said frame.

4. An article of manufacture comprising in combination a frame having an opening extending transversely therethrough, a cutting tool guide integral with said frame, a cover fitted onto said frame to close said opening therein, a plate, attachment means interconnecting said cover and said plate to permit relative motion therebetween, said frame having a groove therein adjacent said opening for receiving said plate when the latter is

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moved relative to said cover to thereby lock said cover onto said frame.

5. An article of manufacture comprising in combination with a cast shell a frame embedded in said shell having an opening extending transversely therethrough, a cutting tool guide integral with said frame, a cover fitted onto said frame to close said opening therein, a latch, and attachment means interconnecting said cover and said latch to permit relative motion therebetween, said frame having a groove therein adjacent said opening for receiving said latch when the latter is moved relative to said cover to thereby lock said cover onto said frame.

6. In a surgical cast the combination of a cast shell disposed about a body member to be treated, a frame embedded in the cast shell defining an opening adjacent a portion of the member to which access may be necessary, a cast cutting tool guiding means on the frame disposed about and spaced outwardly from said opening, means closing the opening between said member and said cast body, and releasable means acting on said means closing said opening and maintaining it in closing relation with said opening when said body shell has been cut away by use of said guiding means.

7. An article of manufacture comprising in combination a frame having an opening extending transversely therethrough, a cover fitted onto said frame to close said opening therein, a plate contiguous with said cover, attachment means interconnecting said cover and said plate for relative sliding movement, said frame having a groove therein adjacent said opening for receiving said plate when laterally displaced relatively to said cover for locking said cover onto said frame, a plurality of ventilation holes in said cover, a plurality of ventilation holes in said plate registering with the above mentioned holes in one position of the parts, and said holes being so located as to register, when said plate is in one position in said groove, and to fail to register when said plate is in another position in said groove.

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8. In a surgical cast the combination of a cast shell disposed about a body member to be treated, a frame embedded in the cast shell defining an access opening therethrough and having a bottom surface for placement upon said body member and having an upper seating surface, a removable closure seated on said surface, a rotatable latch rotatable in relation to and above said closure and engageable in one position with said frame for maintaining said closure in position on said seat, said latch being rotatable to disengage it from said frame and to release said closure for removal from said frame.

9. An article of manufacture for use with a surgical cast comprising in combination a frame defining an access opening therethrough and having a bottom surface for placement upon the body of a person and having an upper seating surface, a removable closure seated on said surface, a latch rotatable in relation to and beneath said closure, and engageable in one position with said frame for maintaining said closure in position on said seat, an actuating handle above said closure and means extending through said closure and connecting said rotatable latch with said handle for engaging and disengaging said latch with said frame by actuation of said handle.

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