

March 14, 1944.

E. ODIERNA ET AL
SURGICAL CAST CUTTER

2,344,262

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2 Sheets-Sheet 1

Fig. 1.

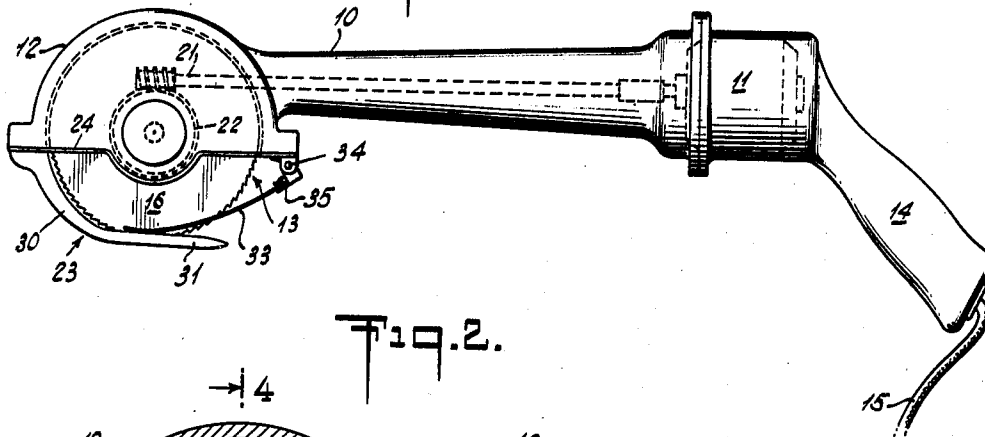


Fig. 2.

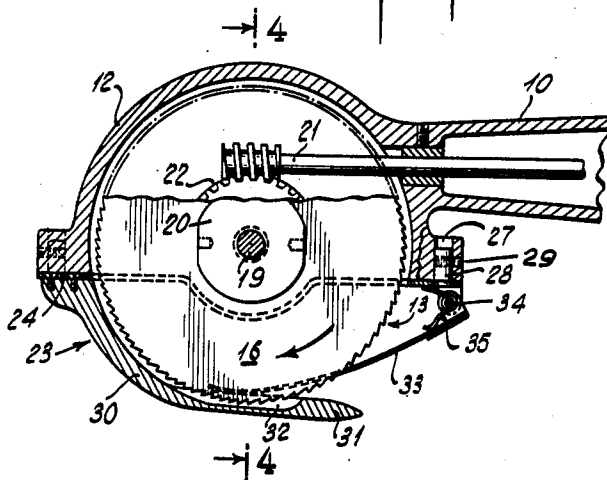


Fig. 4.

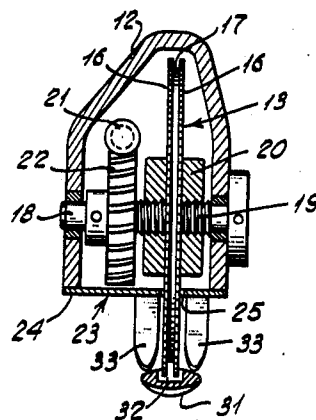
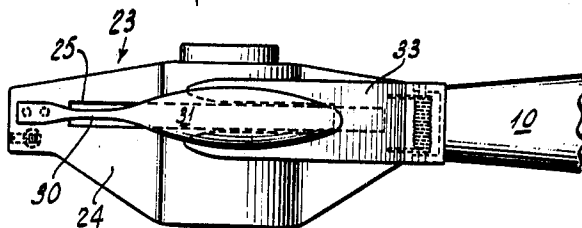


Fig. 3.



INVENTORS
ERNEST ODIERNA.
and ANGELO PROCARIO.
BY
Lawrence M. Munk
ATTORNEY

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E. ODIERNA ET AL

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Fig. 5.

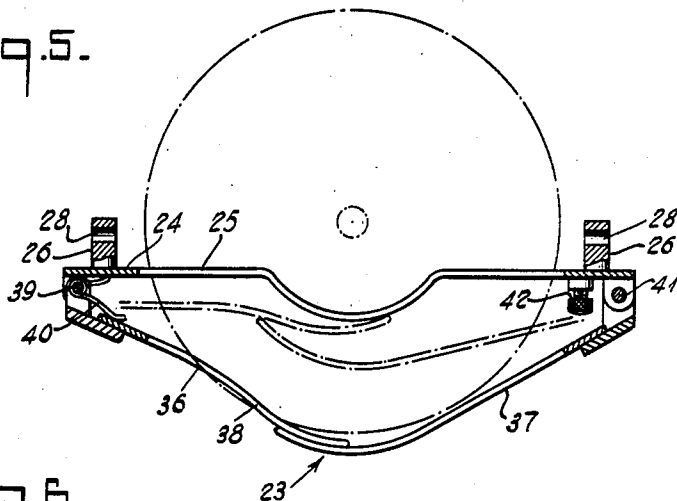


Fig. 6.

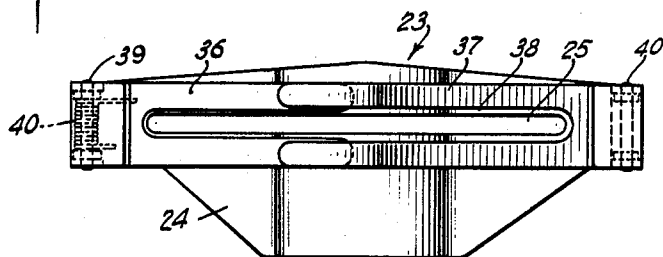


Fig. 7.

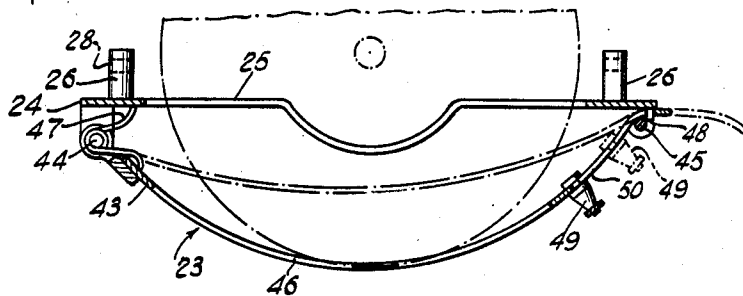
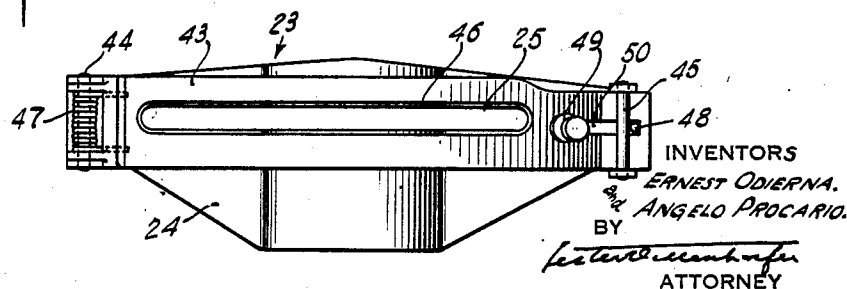


Fig. 8.



INVENTORS
ERNEST ODIERNA.
ANGLO PROCARIO.
BY
Festerman
ATTORNEY

UNITED STATES PATENT OFFICE

2,344,262

SURGICAL CAST CUTTER

Ernest Odierna and Angelo Procario,
New York, N. Y.

Application November 10, 1943, Serial No. 509,652

4 Claims. (Cl. 30—167)

This invention relates to a surgical cast cutter, and more particularly to certain improvements in a portable, electrically operated cast cutter of the rotary saw type.

The instrument is adapted for use by surgeons and others for removal of the plaster of Paris casts employed in the treatment of fractured or dislocated bones, as well as for other purposes. Such casts usually are formed of layers of cotton or gauze and bandage stiffened and hardened with plaster of Paris or the like.

Considerable difficulty is experienced, and discomfort caused the patient, in the removal of plaster casts. Generally this is done with a hammer and chisel, or with shears, although it has been proposed to use rotary saws or cutters for this purpose.

The rotary cutters heretofore used have been limited to making only longitudinal cuts in the cast since it has been necessary to engage the cutter in an edge of the cast. Such cutters cannot be used where it is required to make a transverse cut to remove only a part of the cast or to cut an opening in the cast. Furthermore, they have generally been deficient in not applying proper pressure to hold the cast firmly during the cutting operation.

One of the objects of the present invention is to provide a cutter of the rotary saw type with detachable and interchangeable guards for making cuts of different character.

A further object is to provide a cutter having guards that will apply pressure on the cast to hold it firmly during the cutting operation.

Another object is to provide the cutter with guards for regulating the depth of the cut.

More general objects are to provide an efficient, simple, and inexpensive cutter of the character described for easily and safely removing plaster casts or parts thereof.

The invention is illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of a cast cutter of the rotary saw type embodying the present invention;

Fig. 2 is a vertical section through the cutter and guard;

Fig. 3 is a bottom plan view of the cutter and guard;

Fig. 4 is a vertical section on the line 4—4 of Fig. 2;

Fig. 5 is a side elevation of a modified form of detachable guard;

Fig. 6 is a bottom plan view thereof;

Fig. 7 is a side elevation of another modification of the guard structure; and

Fig. 8 is a bottom plan view of the guard of Fig. 7.

Having reference now to the drawings, and particularly to Figs. 1-4 thereof, 10 indicates a hollow casing having an electric motor 11 at one end and a housing 12 at the other end covering the upper part or half of the rotary cutter 13. The casing is provided with a grip or handle 14 from which an electric cord 15 extends for connecting the instrument to an outlet. A switch (not shown) may be located at any convenient point of the grip or casing to control operation of the motor.

The cutter 13 comprises two disk saws 16 and a spacer 17 detachably mounted on an arbor 18 journaled in the housing 12 and arranged to rotate as a unit. The arbor may be threaded at 19 and the cutter detachably held thereon by nuts 20. The cutter is driven by the motor through a worm shaft 21 and gear 22, and it operates to cut a relatively narrow slot through the cast.

The detachable guard, indicated generally by the reference character 23, comprises a plate 24 having a longitudinal slot 25 through which the lower half of the cutter passes. The plate has a stud 26 at each end, which studs fit into openings 27 in the housing and have transverse holes 28 into which the screws or pins 29 are secured to fasten the guard detachably to the housing. Any suitable means may be provided for detachably fastening the parts.

Extending downward from one end of guard plate 24 is a fixed, curved, arm 30 that terminates in a finger 31, which finger is formed with a depression 32 in which the bottom edge of the cutter rotates. The lower portion of arm 30 is made thin enough to pass through the slot cut in the cast by the cutter, and the finger 31 is formed with a rounded tapered end adapted to engage under an edge of the cast.

A movable arm 33 is hinged or pivoted at 34 to the other end of guard plate 24 and is provided with a spring 35 that normally bears the arm down against the finger 31. The free end of arm 33 is forked to span the cutter, as best seen in Fig. 4. This arrangement provides the necessary pressure to grip the cast firmly between the parts so that the rotary saws will cut cleanly through the cotton gauze and bandage layers of the plaster cast.

The guard heretofore described is adapted for use in making a longitudinal cut in the cast. A modified form of the detachable guard for use

in making transverse cuts, as well as longitudinal ones, of controlled depth, is shown in Figs. 5 and 6. In this form the guard plate is provided with two movable arms 36 and 37 each having a forked end, which forked ends overlap and together form a slot 38 through which the lower edge of the cutter passes. Arm 36 is hinged to the plate at 39 and is provided with a spring 40 that presses the arm down, while arm 37 is hinged at 41 to the opposite end of the plate.

An adjustable screw stop 42, or other suitable means, may be provided to limit the upward range of movement of the arms 36 and 37, thus to control the depth of the cut, it being understood that these arms bear on the surface of the cast during the cutting operation. Since the two arms remain in lapped relation throughout their range of movement only one spring of a proper tension is required to provide the desired pressure.

Another form of detachable guard is shown in Figs. 7 and 8 wherein the guard is provided with a single, normally arcuate shaped, movable arm 43 that has one end hinged at 44 to the plate 24, and that has its opposite end supported to ride or slide on a pin or roller 45 carried by the plate. The arm 43 has a longitudinal slot 46 for passage of the lower edge of the cutter. A spring 47 is provided at the hinged end to effect the desired pressure on the arm. A fixed stop 48 located at the free end of the arm limits its downward movement.

The upward range of movement of the guard arm 43, and consequently the depth of the cut, may be regulated by means of an adjustable stop 49, movable in a slot 50 formed in the free end of the arm, and that can be set in adjusted position. By adjusting the position of stop 50 relative to pin 46 the extent of upward movement is controlled.

While the instrument is shown with its casing and handle extending forwardly from the cutter, to operate with a pulling action, which is the preferred manner, it may be constructed to operate with a pushing action by reversing the position of the casing and handle. Other changes may be made in the details illustrated and described within the scope of the invention defined in the claims.

What we claim is:

1. In a surgical cast cutter of the character described the combination with a rotary cutter and a housing therefor, of a guard detachably fastened to the housing, said guard comprising a

plate having a slot for passage of the cutter, a pair of opposed downwardly extending movable arms pivotally secured to the plate, said arms having overlapped forked ends that together form a slot in which the bottom edge of the cutter rotates, and a spring bearing on one of the overlapped arms to press both arms down against the surface of the cast.

2. In a surgical cast cutter of the character described the combination with a rotary cutter and a housing therefor, of a guard detachably fastened to the housing, said guard comprising a plate having a slot for passage of the cutter, a pair of opposed downwardly extending movable arms pivotally secured to opposite ends of the plate, said arms having overlapped forked ends that together form a slot in which the bottom edge of the cutter rotates, a spring bearing on one of the overlapped arms to press both arms down against the surface of the cast, and adjustable means for regulating the range of upward movement of the arms to control the depth of the cut.

3. In a surgical cast cutter of the character described the combination with a rotary cutter and a housing therefor, of a guard detachably fastened to the housing, said guard comprising a plate having a slot for passage of the cutter, a downwardly extending movable arm having one end pivotally secured to the plate and having its opposite end slidably mounted on a support carried by the plate, said arm having a slot through which the bottom edge of the cutter extends, a spring bearing on the arm to press it down against the surface of the cast, and adjustable means for regulating the range of upward movement of the arm to control the depth of the cut.

4. In a surgical cast cutter of the character described the combination with a rotary cutter and a housing therefor, of a guard detachably fastened to the housing, said guard comprising a plate having a slot for passage of the cutter, a downwardly extending movable arm having one end pivotally secured to the plate and having its opposite end slidably mounted on a support carried by the plate, said arm having a slot through which the bottom edge of the cutter extends, a spring bearing on the arm to press it down against the surface of the cast, a fixed stop for limiting the downward movement of the arm, and an adjustable stop for regulating its upward movement to control the depth of the cut.

ERNEST ODIERNA.
ANGELO PROCARIO.