

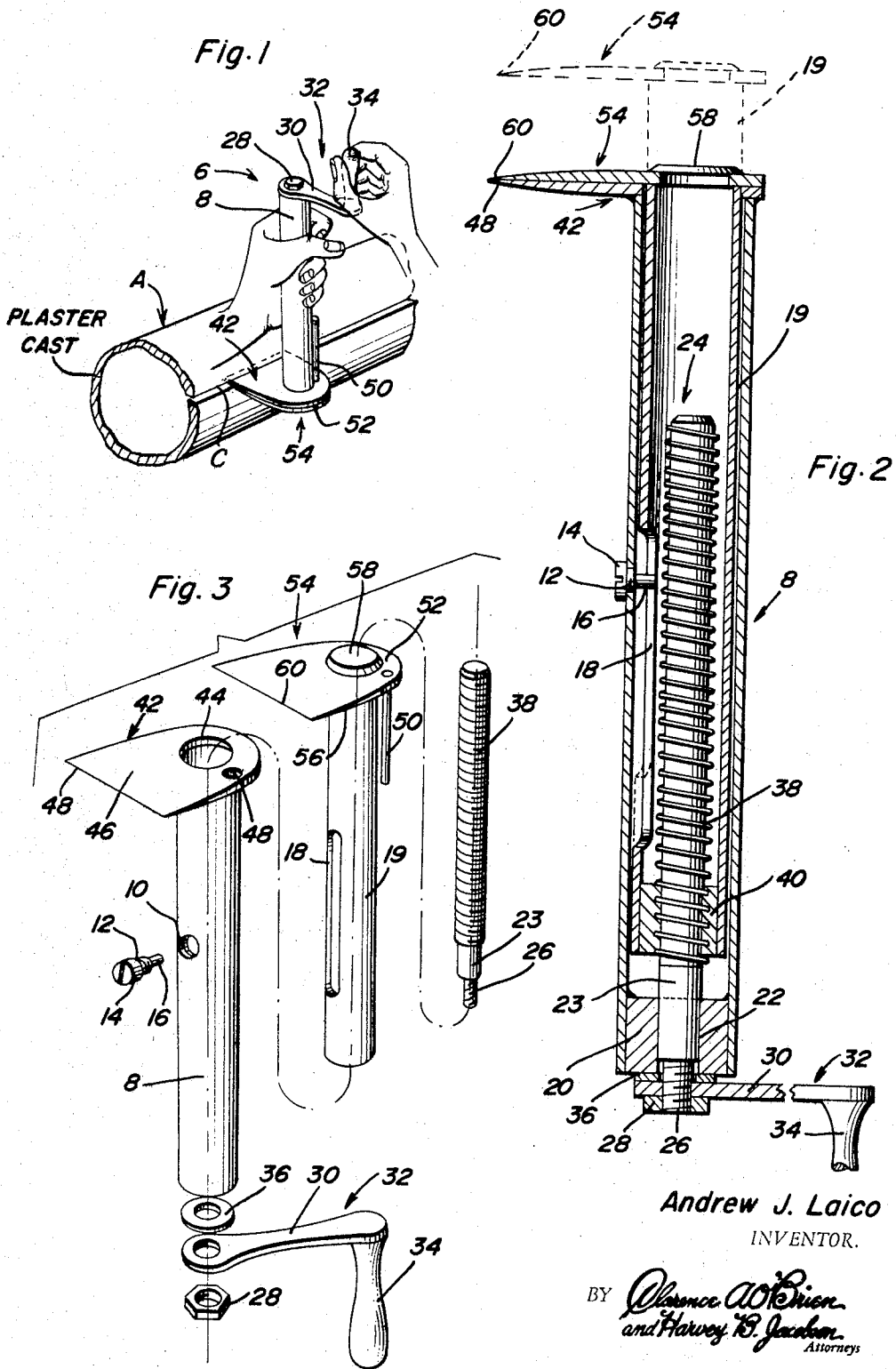
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A. J. LAICO

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CAST SPREADER AND BREAKER

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CAST SPREADER AND BREAKER

Andrew J. Laico, 1313 2nd St.,
Port Angeles, Wash. 98362

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4 Claims

ABSTRACT OF THE DISCLOSURE

A jack screw, turned by a conveniently located handcrank, projects an inner cylinder beyond a complementary outer cylinder. Upper ends of both cylinders have mated jaws whose beveled companion lips can be wedged between spreadable edges of a leg, body, or arm cast. To operate: insert jaws and hold outer cylinder with left hand. Turn crank with right hand to open jaws. The slitted cast is thus expanded, broken and quickly removed.

This invention relates to certain new and useful improvements in a cast spreader and breaker, that is, a simple and practical handtool for manually manipulable use by a doctor, nurse or other trained assistant when called upon to free and remove a cast from a leg, thigh, arm, shoulder or other part of a patient's body.

When a plaster cast is readied for removal it has to be slitted lengthwise with a suitable cast cutter after which the opposed edges are pried apart. Manifestly, the easier it is to spread the severed edges apart, the better it is for the patient. To the ends desired special fracture equipment and orthopedic implements are available. Known as cast spreaders they are pliers-like, tongs-like and sometimes similar to a jaw-type wrench, are made of light weight stainless steel for light or heavy duty purposes, and are equipped with openable and closable wedge-like jaws having leading knife-like tips or lips which are readily insertable between the cast edges to spread the same apart. The force needed is mechanically applied in one manner or another.

Prior art spreaders, particularly for body casts, are marketed and in widespread use but are often difficult and clumsy to handle, even by patient and skillful users. The herein disclosed spreader and breaker is expressly designed and adapted for any and all casts, regardless of size, length or thickness.

Briefly, the here disclosed spreader comprises a hand-held jack equipped with a pair of companion jaws one jaw 42 of which is designated as relatively stationary and the other one 54 as movable relative thereto. These jaws 42 and 54 are aligned and mated in face to face overlapping relationship when closed (FIGS. 1 and 2), corresponding leading ends of said jaws being provided with beveled openable and closable cast prying lips 48 and 60 which are readily alignable with and insertable between the usual opposed edges C of the longitudinally slitted cast A, whereby when the jack is operated (FIG. 1) by the nurse or other attendant the jaws 42 and 54 spread apart and loosen the cast for unhampered painless removal.

In carrying out the concept the tool or implement is such that little effort is required to handle and use it. The handcrank is free-wheeling and controllably smooth but positive in action. The inner sleeve or cylinder is easily slowly fed in or out on a threaded jack screw. Easy handling is attainable because the outer cylinder or grip is of a comfortable diameter which assures a firm grasping hold, steady guidance, and reliable manipulation. This spreader is compact and convenient, has smooth surfaces, and is easy to dismantle when necessary. The spreading force is steady and constant and the spread

of the jaws is limited to just less than three inches, more or less. To operate, the user inserts the tip ends of jaws, holds outer cylinder in left hand, and turns the crank with the right hand. Accordingly, this unique spreader well serves the purposes for which it is intended.

An object of the over-all invention, broadly construed, is to improve upon such prior art plaster cast spreaders as are presently being manufactured, sold and used. To the ends desired and as has been satisfactorily proved by an experimental implement the adaptation herein shown and described is unique in that little effort is required in the operation. The outer cylinder, or shaft as it is sometimes called, is of comfortable diameter which permits a firm grip and steady manipulation. The handcrank for operating the feed screw is free-wheeling and smooth in action and results in the inner cylinder or shaft moving easily on the threads of the screw and spread force assures a safe and reliable result and because the user handles the same with confidence, the patient is seldom disturbed to a point of apprehension as to the result which is safely assured.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a view in perspective on a relatively small scale showing a fragmentary portion of a slitted plaster cast and the improved spreader and breaker and one manner of holding and using it.

FIG. 2 is a suitably enlarged view in section and elevation showing all of the component parts and how they are constructed and cooperate.

FIG. 3 is an exploded perspective view showing all of the component parts in read to assemble relationship.

The hand held and manipulable jack is denoted by the numeral 6 and as shown in FIG. 1 is adapted to be held in one hand, say the left hand while the free-wheeling handcrank is caught hold of and turnable by the other hand. More specifically the jack comprises an outer suitably elongated rigid cylinder 8 the median portion of which is provided with a screw-threaded hole 10 to accommodate the screw-threaded portion 12 of the shank of a set-screw 14. The inner reduced end of the shank is denoted at 16 and serves in the manner illustrated in FIG. 2. This is to say, the end portion 16 projects into an elongated slot 18 which provides a keyway therefor when the inner, suitably proportioned cylinder is fitted telescopically into the hollow portion of the outer cylinder and assembled in the manner fully shown in FIG. 2. The "bottom" or inner end portion (FIG. 2) of the outer cylinder is provided with a fixedly mounted bushing 20 the bore of which provides a bearing 22 for the smooth-surfaced journal portion 23 of a feed screw or jack screw denoted generally by the numeral 24. The reduced end portion of the jack screw is denoted at 26 and is suitably screw-threaded to accommodate an assembling and retaining nut 28 which is used to apply and clampingly hold the apertured end portion of one arm 30 of the hand manipulable crank 32. The handgrip of the crank is denoted at 34. The numeral 36 designates a spacing and assembling washer which promotes satisfactory operation of the handcrank in turning of the threads 38 on the aforementioned jack screw. The "inner" end portion of the inner sleeve or cylinder is provided with a fixedly mounted nut 40 the threads of which serve to provide the desired jack screw action in a manner evident, it is believed, from FIG. 2.

With respect now to the spreader jaws, two substantially alike jaws are provided and one jaw which is called

the first jaw is denoted by the numeral 42. The apertured end portion 44 of this jaw is fixedly joined to the outer or upper open end portion of the cylinder 8 in the manner shown. The over-all jaw is substantially wedge-shaped and has a planar or flat surface at 46. The free working end of the jaw provides a feather edge as at 48 which is referred to as a tip and also a lip. The right hand attached end portion of the jaw 42 as shown in FIG. 3 is provided with a guide opening 49 for a guide and stabilizing pin 50 which is offset and has one end attached to the end portion 52 of the second jaw 54. The jaw 54 is similar in construction to the jaw 42 and has a face 56 which confronts the face 46 when the two jaws are in closed and substantially overlapping contact or relationship as shown in full lines in FIG. 2. The end portion 52 is suitably attached as at 58 to the coacting upper or outer end portion of the inner cylinder 19. The feather edge portion of the jaw 54 is further and suitably tapered as at 60 to provide a lip or tip for coaction with the corresponding tip or edge 48.

As shown in the manner of use illustrated in FIG. 1 before a plaster cast A is removed from a leg, arm or other body part (not shown), it must be cut with a cast cutter to provide the aforementioned spreadable slit or severed portion C. The easier it is to spread the cast the better it is for the patient. The spreader herein shown is of stainless steel and the jaws have a spread of approximately three inches more or less. Manifestly, the spread could be increased by extending the inner cylinder of the jack and constructing the jack screw and component parts in proper proportion. It is also clear that the cast spreader can be made in different sizes and will work equally well on all leg, arm and body casts and also with equal facility on hand, wrists, shoulder and analogous casts (not detailed). As previously mentioned there are heavy duty plaster cast spreaders available and on the market but they are generally too thick at the ends of the blade-like jaws and are clumsy to handle and turn. The spreader and breaker here shown is designed principally for body casts and can be used in the manner suggested in FIG. 1 with highly satisfactory results.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A manually held and manipulable spreader and breaker for leg, body, arm and similar casts comprising, in combination, an extensible and contractable jack of a cross-sectional dimension length and weight that it is capable of being satisfactorily and securely held in one hand while it is being handled and used and embodying a first relatively stationary jaw and a second relatively movable companion jaw, said jaws extending in a direction at right angles to the longitudinal axis of said jack and being aligned and mated in face to face overlapping relationship when closed, said jaws having corresponding leading ends provided with beveled openable and closable cast prying lips which are readily alignable with and insertable between the opposed edges of a longitudinally slitted cast, each jaw comprising a rigid blade-like plate, said plates being alike in construction, having confronting flat faces superimposed upon each other when the jaws are closed, said leading end being feathered and of knife-like gage to achieve the inserted ready-to-pry step of use, one of said jaws having an offset guide hole therein, the other jaw having an oriented stabilizing pin fixed thereto and projecting at right angles therefrom and extending slidably and guidingly through said guide hole in a manner to maintain both jaws accurately aligned at all times

during use, said jack comprising inner and outer cylinders, said inner cylinder fitting telescopically and slidably in said outer cylinder, said inner cylinder having a fixed collar-nut, a jack screw threaded through said nut and passing slidably through a bushing fixed in said outer cylinder.

2. The spreader according to claim 1, and wherein said inner cylinder is provided in one side wall with a longitudinal slot constituting a keyway, said outer cylinder being provided in a contiguous side wall with a stationary setscrew having an inner end shank portion constituting a key and projecting into said keyway-slot.

3. For use by a doctor, nurse or a trained assistant, a spreader capable of spreading a longitudinally slitted plaster cast on a leg, body or arm of a patient characterized by a hand-held manually manipulable jack comprising, an outer cylinder having inner and outer open ends, a bushing plugged and fixed within the inner end and providing an axial bearing, a complementary inner cylinder fitted telescopically and slidably within the hollow portion of said outer cylinder, a feed nut fixed in the inner end of said inner cylinder in line with said bushing, a jack screw threaded through said nut into the hollow portion of said inner cylinder, the inner end of said jack screw having a spindle portion journaled in said bearing and provided exteriorly of said cylinders with a hand-crank which can be turned with one's right hand while the outer cylinder is grasped and held with the user's left hand, a relatively stationary jaw fixed to the outer open end portion of said outer cylinder, and a companion jaw likewise fixed to the corresponding outer end of said inner cylinder, said jaws being alike in design, being adaptably mated in face-to-face relationship and having similarly beveled knife-like leading ends providing entrance tips for prying and spreading opposed edges of a slitted cast apart, and the major portion of said jaws including said knife-like leading ends extending in a direction transverse to the longitudinal axes of said cylinders, one jaw having an offset guide hole therein, the other jaw having an oriented stabilizing pin fixed thereon and lateral thereto and extending slidably and guidingly through said guide hole, whereby to maintain said jaws properly aligned at all times.

4. The spreader according to claim 3, and wherein said inner cylinder is provided in one side wall with a longitudinal slot constituting a keyway, said outer cylinder being provided in a contiguous side wall with a stationary setscrew having an inner end shank portion serving as a key and projecting into said keyway-slot.

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RICHARD A. GAUDET, *Primary Examiner*.

RONALD L. FRINKS, *Assistant Examiner*.

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