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ACCESSORY FOR SURGICAL RETRACTOR

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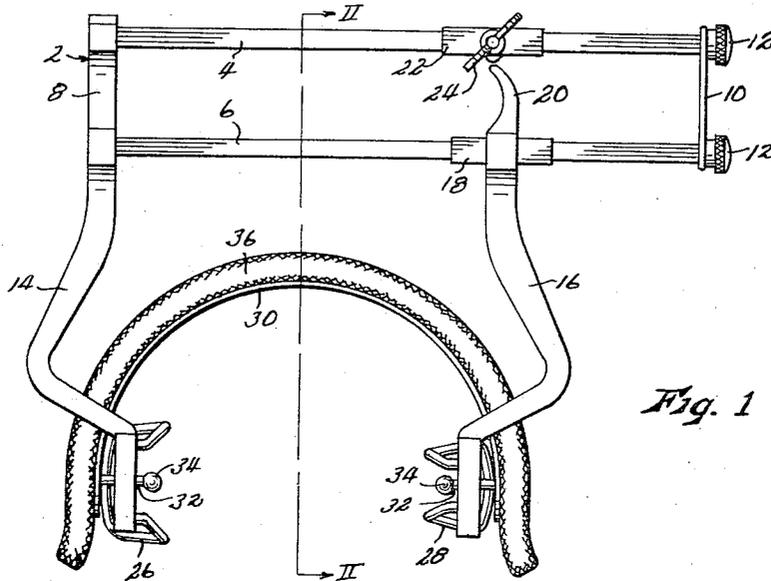


Fig. 1

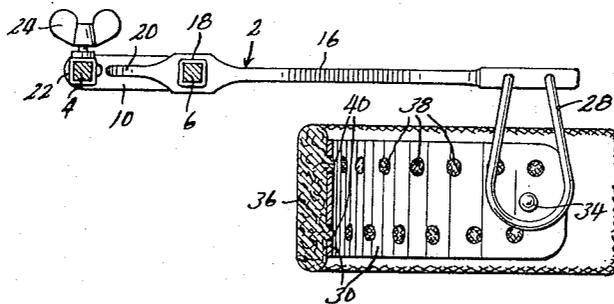


Fig. 2

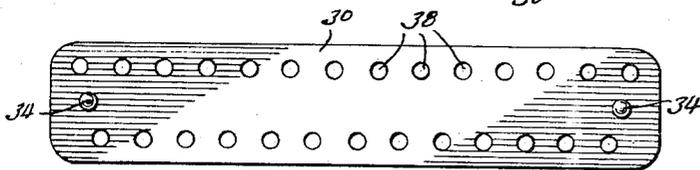


Fig. 3

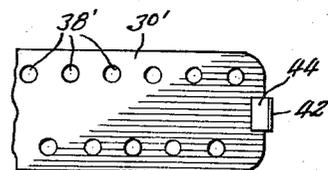


Fig. 5

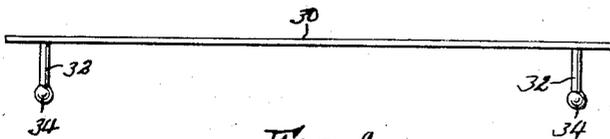


Fig. 4

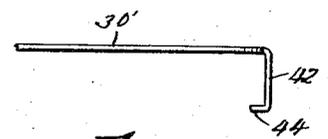


Fig. 6

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**ACCESSORY FOR SURGICAL RETRACTOR**

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**ABSTRACT OF THE DISCLOSURE**

This application discloses an accessory for a Balfour retractor for enlarging and forming a surgical incision which has been spread by the fingers of the retractor. It comprises a flat strap curved transversely to its plane and transversely to the general extent of said fingers so as to lie within the incision, and means for attaching the respective ends of said strap to the fingers of the retractor.

This invention relates to new and useful improvements in surgical retractors, and has particular reference to an accessory for a surgical retractor commonly known as a Balfour retractor. The Balfour retractor consists of a frame carrying a pair of arms for relative movement thereon, each arm having a laterally projecting finger at the free end thereof, said fingers being insertable in a surgical incision and separable by relative movement of said arms on said frame to hold the edges of said incision apart to provide a clear operating field therebetween in which the surgeon can operate. This is a commonly used type of retractor, particularly in abdominal operations.

The principal objects of the present invention are the provision of an accessory attachment for a Balfour retractor which will increase the size of the clear operating field provided thereby, and will provide for operating fields of odd or irregular shapes whenever such may be necessary, desirable or convenient for the surgeon.

Other objects are simplicity and economy of construction, and efficiency and dependability of operation.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing, wherein:

FIG. 1 is a top plan view of a Balfour surgical retractor, with an accessory embodying the present invention shown in operative relationship thereto,

FIG. 2 is a sectional view taken on line II-II of FIG. 1,

FIG. 3 is a laid-out face view of the retractor accessory as shown in FIGS. 1 and 2,

FIG. 4 is an edge view of the accessory as shown in FIG. 3,

FIG. 5 is a fragmentary view similar to FIG. 3 but showing a slightly modified construction, and

FIG. 6 is an edge view of the modified construction shown in FIG. 5.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies generally to a Balfour surgical retractor of a common type. It consists essentially of a frame comprising a pair of parallel, spaced apart slide bars 4 and 6 of square cross-sectional contour having corresponding ends thereof joined rigidly together respectively by connector bars 8 and 10. Bar 8 is permanently joined to bars 4 and 6, while bar 10 is detachably connected to bars 4 and 6 by knurled nuts 12 in order that the various members to be carried by the slide bars may be removed and replaced. Extending laterally from slide bars 4 and 6, in the plane thereof, are a pair of elongated arms 14 and 16. Arm 14 is integral with and forms an extension of connector bar 8, while arm 16 is affixed to a short tubular sleeve 18 mounted slidably on slide bar 6. Sleeve 18 is sufficiently short, and

sufficiently loose on bar 6, that any force applied to the free ends of arms 14 and 16, tending either to move said arms closer together or farther apart, will cause said sleeve to bind on bar 6 and lock against movement thereon. On the other hand, force applied to arm 16 closely adjacent bar 6 will cause said sleeve to slide freely along the bar. An extension of arm 16 between bars 4 and 6 constitutes a finger grip 20 by means of which force may conveniently be applied to move arm 16 away from arm 14. Another sleeve 22 similar to sleeve 18 is slidably mounted on slide bar 4, to which auxiliary instruments may be attached by means of wing nut 24, but this is not pertinent to the present invention. Affixed respectively to the free ends of arms 14 and 16 are a pair of fingers 26 and 28, said fingers extending transversely to the plane established by arms 14 and 16. As shown, each of said fingers constitutes a loop of heavy wire or rod stock having its ends welded or otherwise affixed to the associated arm. In some retractors, on the other hand, said fingers constitute imperforate strips of sheet metal, such as stainless steel.

The structure thus far described constitutes a standard Balfour retractor, which is of course well known and in common use. In application, the frame 2 is rested on the patient's body adjacent a surgical incision, or on any other suitable support, and with arms 14 and 16 disposed in close juxtaposition, the fingers 26 and 28 are inserted into the incision with arms 14 and 16 extending generally parallel to the incision. The arms are then moved relatively apart by sliding sleeve 18 along bar 6, using finger grip 20 as a handle, whereupon fingers 26 and 28 draw the edges of the incision apart to clear an operating field therebetween in which the surgeon may work. However, this type of retractor has the disadvantage that, due to the narrowness of the fingers 26-28, the incision tends to close at even rather short distances from the fingers, along the axis of the incision, with the result that the size of the clear operating field provided thereby is rather limited. Also, the shape or contour of the opening provided thereby is generally dictated by the natural resiliency of the patient's tissues as they try to recover from the distention caused by the retractor, while the surgeon may for convenience actually need an opening of a different shape or contour. If it is attempted to enlarge the opening by separating arms 14 and 16 still farther, the distention at the fingers themselves will of course be greater than would have been required if said opening could have been shaped to the desired size and contour by other means, and the operative damage to the tissues may be increased.

In order to overcome these difficulties, the present invention contemplates an accessory for the retractor thus far described, said accessory comprising a generally rectangular strap 30 of sheet metal or the like, said strap having a post 32 affixed thereto adjacent each end thereof and extending at right angles to the plane thereof, both in the same direction, each post having an enlarged knob 34 at the outer or free end thereof. As indicated in FIGS. 1 and 2, strap 30 may be formed, transversely to its plane, into a generally semi-circular form, with posts 34 extending inwardly relative to said curvature. In use, said strap is then inserted into the incision of the patient in such a manner that posts 32 project inwardly in opposed relation through the loops constituting fingers 26 and 28. Said fingers thus support the strap against being collapsed or compressed by the pressure of the patient's bodily tissues thereagainst, and the inclusion of posts 32 in the finger loops prevents any appreciable shifting of the strap relative to the fingers. Knobs 34 assist in preventing any accidental dislodgment of posts 32 from the fingers. It will be apparent that if fingers 26-28 were of the type consisting of spatulate fingers of sheet metal, apertures could be drilled or otherwise formed therein to receive posts 32.

Thus it will be readily apparent that strap 30 forms a dam for holding back the patient's tissues and organs within the incision, and provides a much larger clear operating field than would be possible without its use, and without requiring a greater separation between the fingers.

Strap 30 could be rigid and preformed to various sizes and shapes, and made available in sets, so that the surgeon could select the one with the size and shape desired for any given set of circumstances. However, said strap is preferably formed of a metal which is sufficiently malleable and ductile that it may be formed to any desired contour by the application of substantial manual force thereto. With this type of strap the surgeon can form it in whatever contour he may desire in any particular case, and the number of straps required will be greatly reduced, although straps of different lengths and widths may still be necessary.

The accessory strap 30 thus far described will commonly be used with a surgical "lap sponge" 36 constituting a thick flat layer of fibrous material, said lap sponge overlying and completely covering the outer convex surface of the strap, and being held thereagainst by the pressure of the patient's body. In order to prevent any possible slippage or displacement of the sponge relative to the strap, the strap has a series of holes 38 formed throughout in longitudinally spaced apart relation throughout its length. Sponge 36, particularly as it becomes saturated with the patient's bodily fluids, tends to bulge through said holes as shown at 40 in FIG. 2, thereby anchoring said sponge and strap against relative movement. As shown, holes 38 are disposed in two rows disposed respectively adjacent the opposite longitudinal edges of the strap. The holes of the two rows are staggered longitudinally of the strap as shown in FIG. 3, in order that any fold line which may be formed transversely across the strap as it is manually formed as discussed above can intersect only one of said holes. This reduces the possibility that the strap will be fractured by work fatigue.

FIGS. 5 and 6 show a slightly modified form of strap, designated by the numeral 30'. It is identical to that shown in FIGS. 1-4 except that it is of one-piece construction, the elements 42 thereof corresponding to posts 32 in FIGS. 1-4 being formed by bent-up extensions integral with the body portion of the strap. At its outer end, each element 42 is bent over to form a short ear 44 forming an enlargement having the same function as the knobs 34 in FIGS. 1-4.

While I have shown and described certain specific embodiments of my invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention as defined by the scope of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. In combination with a surgical retractor consisting of a pair of fingers carried for relative movement by a frame and insertable in a surgical incision, said fingers being separable by relative movement thereof on said frame to separate the walls of said incision, an accessory comprising:

- (a) an elongated strap of sheet material the plane of which is generally parallel to the longitudinal extent of said fingers and which is curved transversely to its own plane in a plane generally at right angles to said fingers, and
- (b) means attaching the opposite ends of said strap respectively to said fingers.

2. The combination as recited in claim 1 wherein said strap is formed of a soft, malleable material capable of being formed manually to any desired contour.

3. In combination with a surgical retractor consisting of a pair of fingers carried for relative movement by a frame and insertable in a surgical incision, said fingers being separable by relative movement thereof on said frame to separate the walls of said incision, each of said fingers having an aperture formed therethrough and opening along a line interconnecting said fingers, an accessory comprising:

- (a) an elongated strap of sheet material the plane of which is generally parallel to the longitudinal extent of said fingers and which is curved transversely to its own plane in a plane generally at right angles to said fingers, and
- (b) means attaching the opposite ends of said strap respectively to said fingers, said means comprising a pair of posts affixed to said strap respectively adjacent opposite ends thereof and extending generally at right angles to the plane thereof, each of said posts being insertable in the aperture of the associated finger.

4. The combination as recited in claim 3 wherein each of said posts is provided at its free end with an enlargement affixed thereto, said enlargement being sufficiently small to pass through the aperture of the associated finger.

5. In combination with a surgical retractor consisting of a pair of fingers carried for relative movement by a frame and insertable in a surgical incision, said fingers being separable by relative movement thereof on said frame to separate the walls of said incision, an accessory comprising:

- (a) an elongated strap of sheet material the plane of which is generally parallel to the longitudinal extent of said fingers and which is curved transversely to its own plane in a plane generally at right angles to said fingers, said strap having a series of holes formed therethrough whereby a surgical sponge pressed thereagainst will tend to bulge through said holes to anchor said sponge against sliding movement on said strap, and
- (b) means attaching the opposite ends of said strap respectively to said fingers.

6. The combination as recited in claim 5 wherein said strap is formed of a soft, malleable material, and wherein said holes are spaced apart longitudinally of said strap, whereby any transverse fold line across said strap can intersect no more than one of said holes.

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