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3,416,520

SURGICAL DRAPE

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Fig. 1

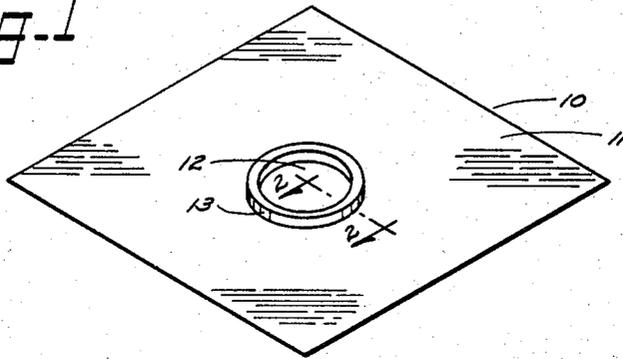


Fig. 2

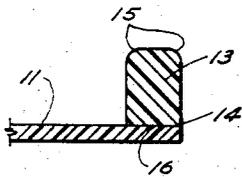


Fig. 3

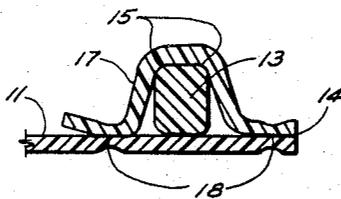


Fig. 5

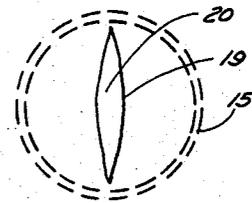
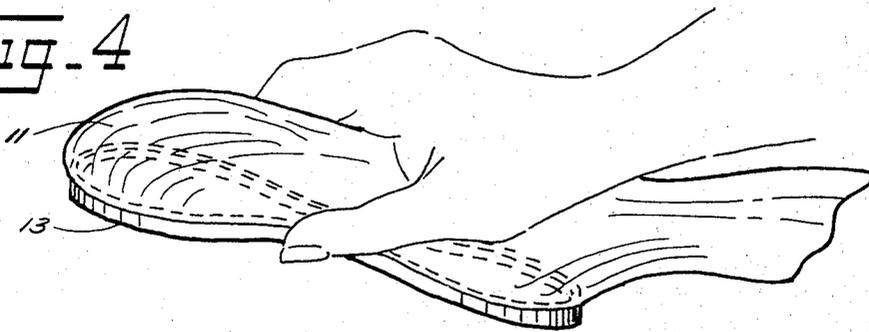


Fig. 4



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3,416,520

SURGICAL DRAPE

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This invention relates to surgical supplies, particularly sterile drapes of the type used for internal operations. More particularly the invention relates to improved means for positioning and anchoring surgical drapes.

Heretofore, conventional surgical drapes have been positioned and held in place in various ways: for example, by sutures or clips, by self-adherence, by adhesive means and by other similar means. One such article of an improved type is held in place by means of a resilient ring which exceeds the size of the surgical incision. In use the ring, secured to a sheet of suitable drape material, is compressed and inserted into the incision and is then released in the body cavity. As an intended consequence, the resiliency of the ring causes it to expand and spread out in the cavity under the edges of the incision, at which position because of its larger diameter in relation to the incision it is effectively secured against unintentional removal. For purposes of protecting the surgical site the drape material in turn extends from the ring out of the incision and over the adjoining body surfaces surrounding the incision. This type of article is generally satisfactory, but during an occasional installation the anchoring ring undesirably may curl or twist whenever the operator compresses the ring and attempts to insert and position the compressed ring in the incision.

When this occurs the ring ordinarily collapses into an unstressed figure 8, double loop or other unmanageable shape and so is difficult to insert and loses its desired property of expanding back into its original ring shape when released. As a result, the procedure must be terminated until order is restored and the surgical drape rearranged to its intended operating position. Such rearrangement is at least inconvenient and time-consuming, if not potentially harmful to the surrounding visceral tissue.

It is therefore an object of the invention to provide a surgical drape which can be readily positioned and held in place without collapse, entanglement or other undesirable dislocation. Another object is to provide means for securing surgical drapes in position to protect the surgical site as required and to afford prompt removal following the need for such protection.

Other objects, features and advantages will be apparent from the following specification and the accompanying drawing in which:

FIGURE 1 is a perspective view of a surgical drape according to the invention;

FIGURE 2 is a partial cross-section of the drape of FIGURE 1 taken at line 2—2;

FIGURE 3 is a similar cross-section illustrating a preferred embodiment of the surgical drape;

FIGURE 4 is a perspective view of a drape being compressed for insertion within a surgical incision; and

FIGURE 5 is a view illustrating the position of the implanted anchor means in relation to the incision.

According to the invention there is provided a surgical drape 10 as illustrated in FIGURE 1 which includes a pliable membrane 11 of suitable size having a hand opening 12 spaced inward from the outer margins of the membrane. Surrounding the opening 12 and attached to it is a loop or anchor means 13. As shown in FIGURE 2, the loop 13 is rectangular in cross-section; also the height of the loop is substantially greater than its width. The loop

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and hand opening 12 coincide generally at the inner edge of the loop. The loop surfaces as viewed in FIGURE 2 are substantially flat so that the loop has generally rectangular corners 15. The loop is joined to the membrane 11 by the seal 16 which may be a heat seal, adhesive seal or other suitable means of fastening the loop to the membrane.

The embodiment of FIGURE 3 illustrates another preferred form in which the loop as in FIGURE 2 is generally rectangular in cross-section but the four corners are rounded to make for ease in handling and to minimize tissue abrasion at the surgical site; instead of rounding the corners a suitable alternative is to put a slight radius or other gradual contour on the top and bottom surfaces of the loop. Also, in the embodiment of FIGURE 3, the loop is attached to the membrane by a sleeve 17 which extends over the top and sides of the loop and is joined to the membrane on two bond lines 18. The bonding of the sleeve to the membrane can be a heat seal, adhesive seal or other suitable seal. Preferably, the sleeve and membrane are water-impervious and the bond line 18 continuous to prevent the entry of body fluids within the sleeve.

In practice, after the surgical incision is made, the surgical drape of suitable size is grasped at the loop 13 and compressed as in FIGURE 4 by holding together two reaches of the loop so that the loop has a generally planar, narrow conformation. The narrowed loop is next threaded or inserted into the surgical incision and passed inward to the body cavity. The loop is then released whereupon it flexes back, as seen in FIGURE 5, into its original open conformation. As shown, the loop extends laterally away from the margins of the incision 19 and is held against withdrawal from the cavity 20 by reason of its substantially larger size as compared with the size of the surgical incision. Finally, the membrane 11 with its center attached to the loop is arranged as required to cover the edges of the incision and to overlie the external surfaces of the body surrounding the incision for ready access by the surgeon to the body cavity 20.

Advantageously, the rectangular conformation of the loop 13 reinforces the same against the undesirable curling or twisting of the loop with the result that the loop under conditions of compression, insertion, placement within the body cavity, and removal can be readily handled without collapse into an unwanted figure 8, double loop or other unmanageable conformation.

For purposes of the invention, the membrane can be made of conventional drape materials, preferably an inert transparent pliable plastic film material such as polyethylene polyvinyl chloride or polyvinylidene chloride plastic film having a thickness of about 2 to 3 mils. The loop likewise can be made of plastic, preferably heat sealable to the membrane or sealable as indicated above by means of applied adhesive or other suitable sealing means. The membrane and loop can have a wide variety of shapes and dimensions depending on particular requirements. One preferred article, for instance, has a square membrane, 36 inches on a side, with a 4½ inch circular opening at the center; the loop is circular with a diameter of 5 inches and a cross-sectional height and width of ½ and ½ inch, respectively. Conveniently, the loop is supplied in a series of several graded openings, for example, measuring across the opening 5, 9 and 11 inches. The loop may be circular, as shown, or oval, triangular, square or other suitable shape. An important requirement of the invention is that regardless of the shape of loop selected, the cross-section should be generally rectangular and uniform throughout, the cross-sectional height should exceed the cross-sectional width and be sufficiently large or rigid to maintain the reaches

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of the loop in substantially one plane when the loop is stressed by finger pressure and the cross-sectional width should be such that the loop can be readily flexed by inward finger pressure and yet can promptly flex outward to its original shape when finger pressure is released.

It will be realized by those skilled in the art that although the invention has been described in considerable detail in the foregoing specification, various modifications in the invention can be made without departing from the spirit of the invention as claimed in the following claims.

I claim:

1. In a surgical drape comprising:

(a) a sheet of pliable membrane material for covering a patient's body surface, the sheet having a hand opening adapted for alignment with a surgical incision, and

(b) means for holding the sheet in position, the improvement comprising flexible anchor means constituting an endless substantially planar open flexible loop surrounding the hand opening and fastened to the sheet at the edge of the hand opening, the loop being manually deformable to a relatively narrow shape suitable for passage of the loop through a surgical incision

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into the adjoining body cavity but further being sufficiently elastic to flex back into its original open loop shape when released from manual pressure so as to lie anchorably beneath the edges of the incision, the reaches of the loop having a generally rectangular cross-section of uniform dimension in which the height exceeds the width whereby the loop can be manually deformed to the narrow shape and deposited in the body cavity without curling or twisting from the planar conformation.

2. A surgical drape according to claim 1 wherein the sheet and loop are fabricated of water-impervious thermoplastic material and are fastened together by heat seal means.

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