

[54] **DISPOSABLE UNITARY SURGICAL DRAPE**

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[52] U.S. Cl. **128/132 D**

[51] Int. Cl. **A61b 19/06**

[58] Field of Search..128/132 D, 154, 155, 156, 157, 128/292; 206/57

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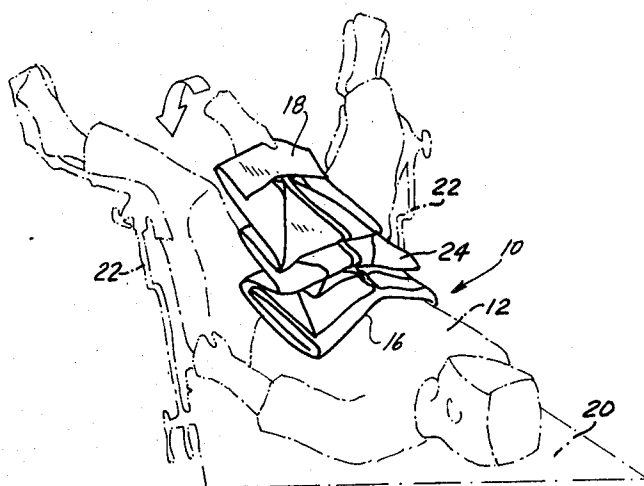
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[57] **ABSTRACT**

A disposable surgical drape is provided for obstetrical and gynecological operative procedures. The drape consists of a combined plastic tail sheet and nonwoven abdominal cover, and leggings folded into a compact package which may be unfolded directly on a patient without necessitating that the surface in patient contact be handled by the doctor or nurse applying the drape. To this end, the abdominal cover which comprises a rectangular sheet is first longitudinally folded and then fan-folded inwardly from both transverse edges toward the center to form a compact rectangular package. Thereafter the tail sheet and leggings which are affixed to the folded abdominal cover along an edge are transversely fan-folded from both edges and subsequently longitudinally folded to form a second rectangular package some of the folds of which overlie and are interdigitated with those of the first package.

10 Claims, 25 Drawing Figures



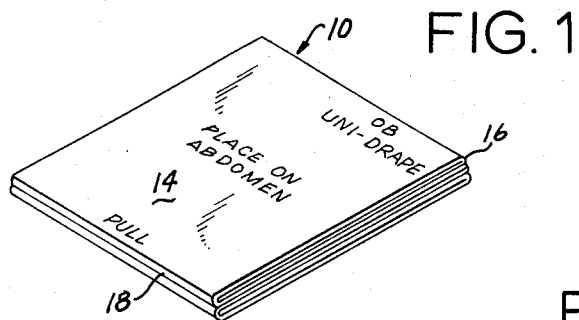
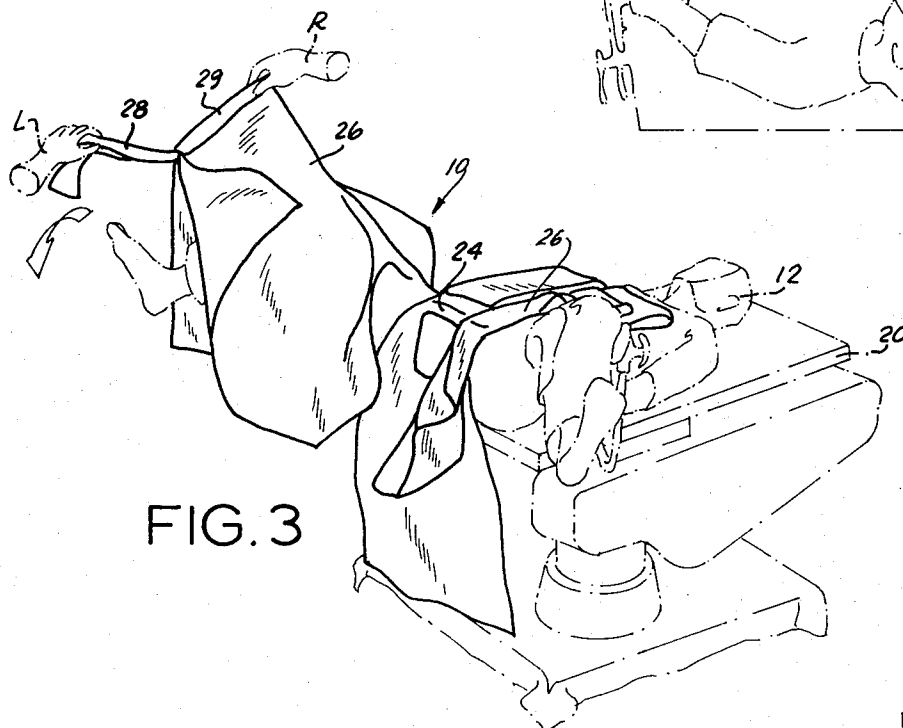
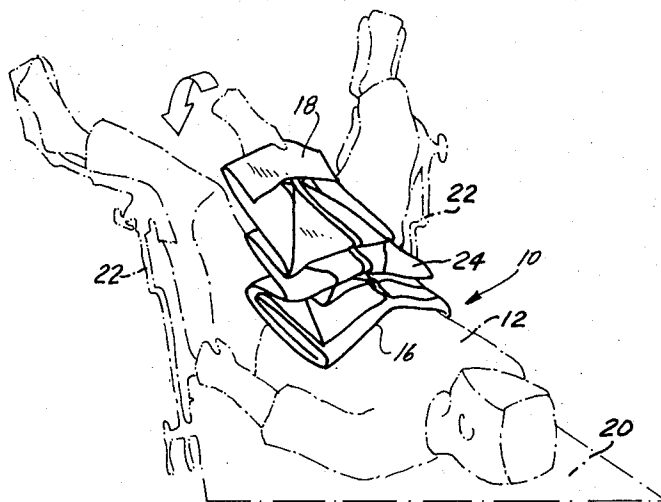


FIG. 2



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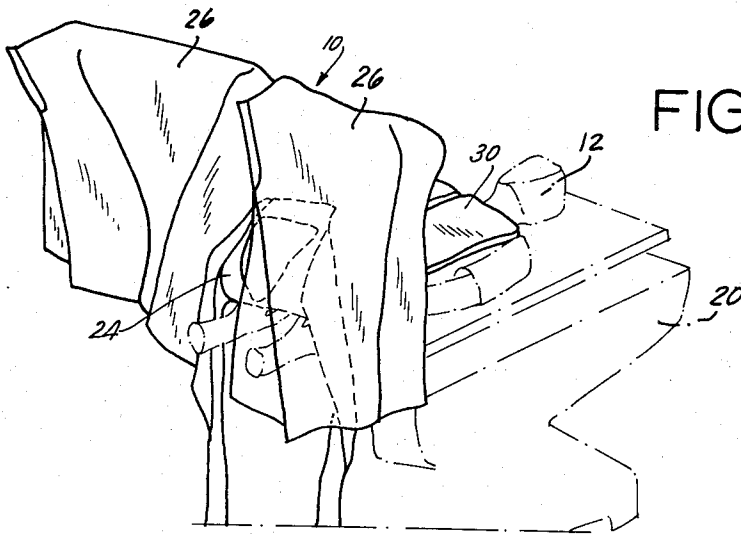


FIG. 4

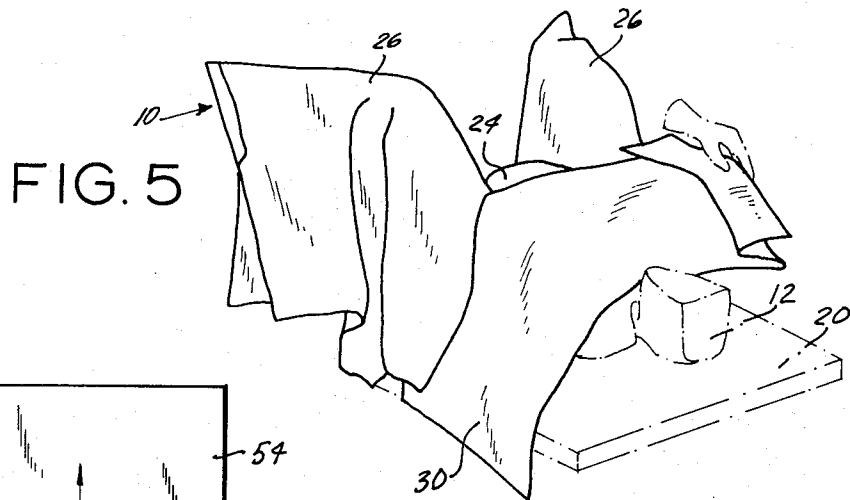


FIG. 5

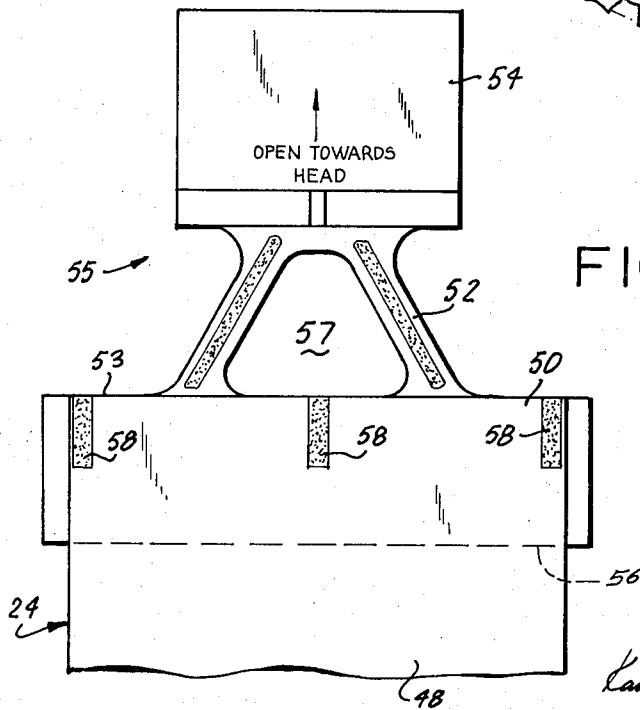


FIG. 10

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FIG. 6

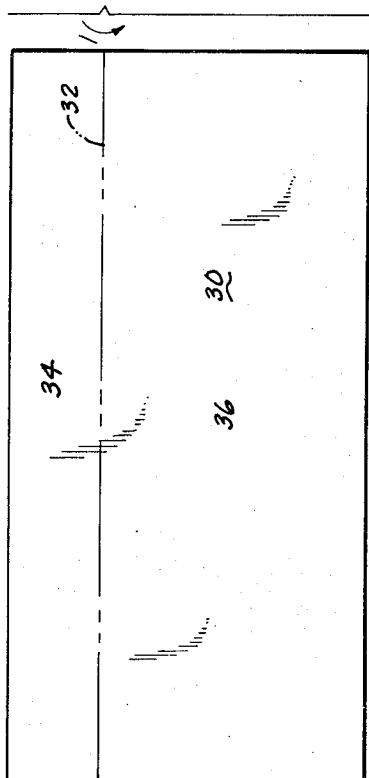


FIG. 7

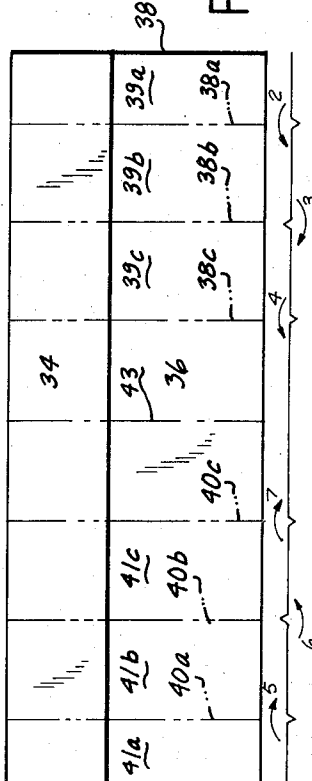


FIG. 11

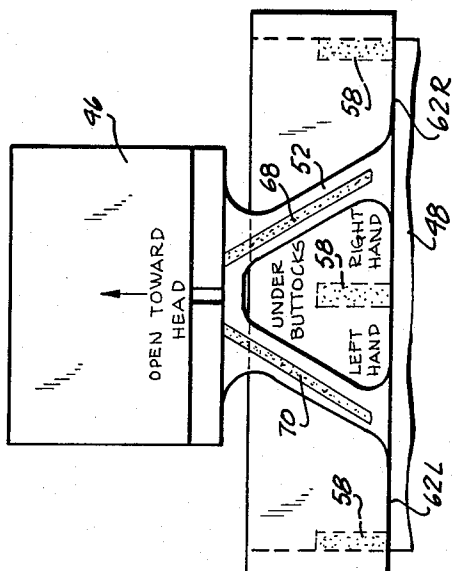


FIG. 9

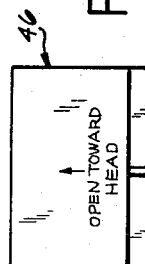
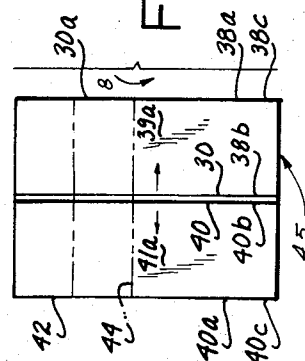


FIG. 8



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FIG. 13

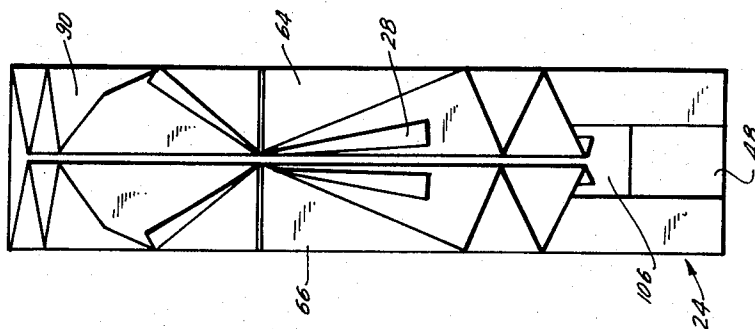
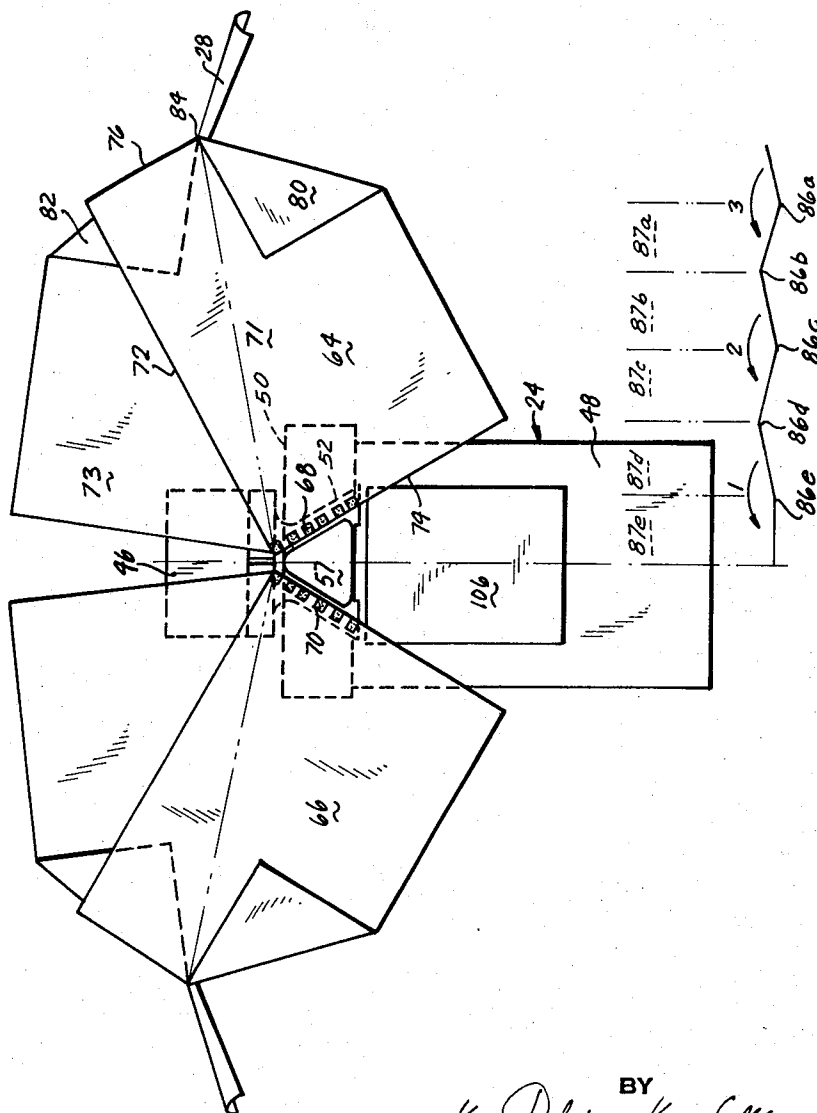


FIG. 12



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FIG. 18

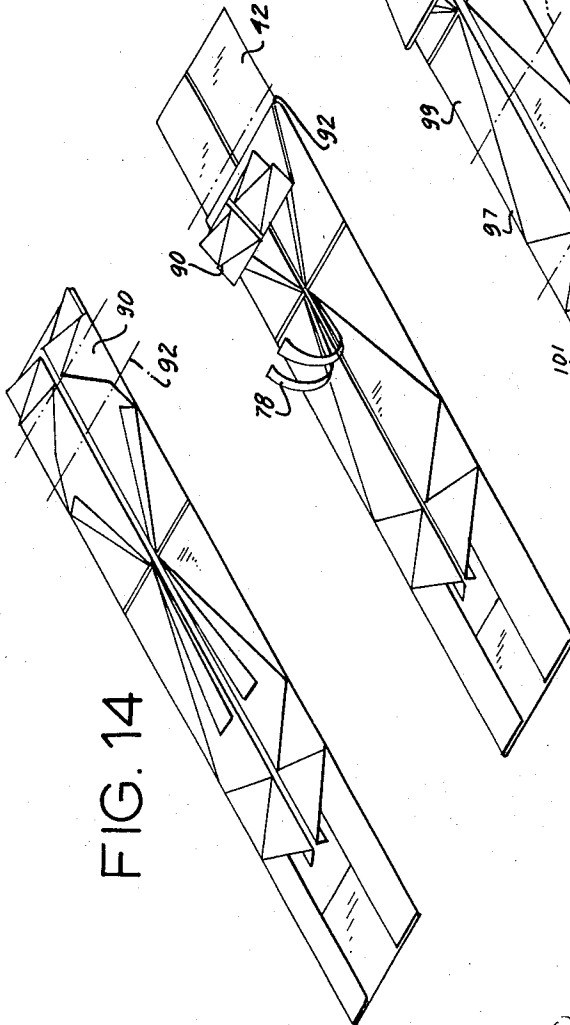
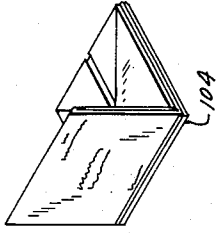


FIG. 14

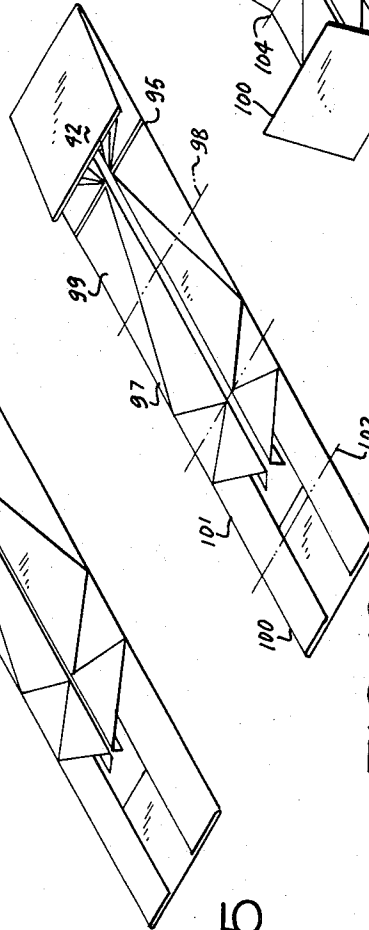


FIG. 15

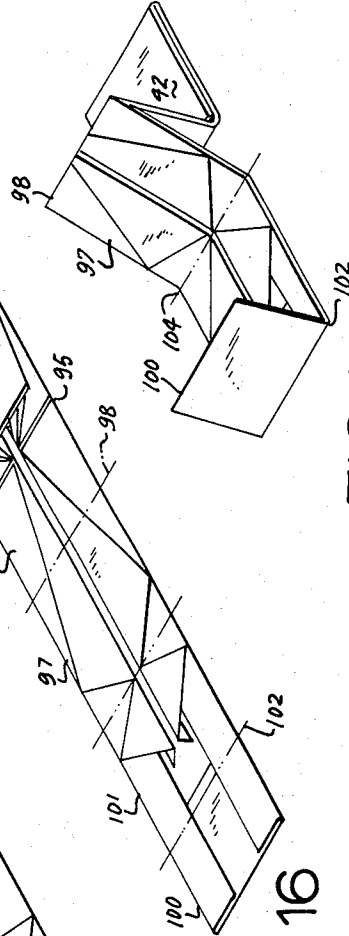
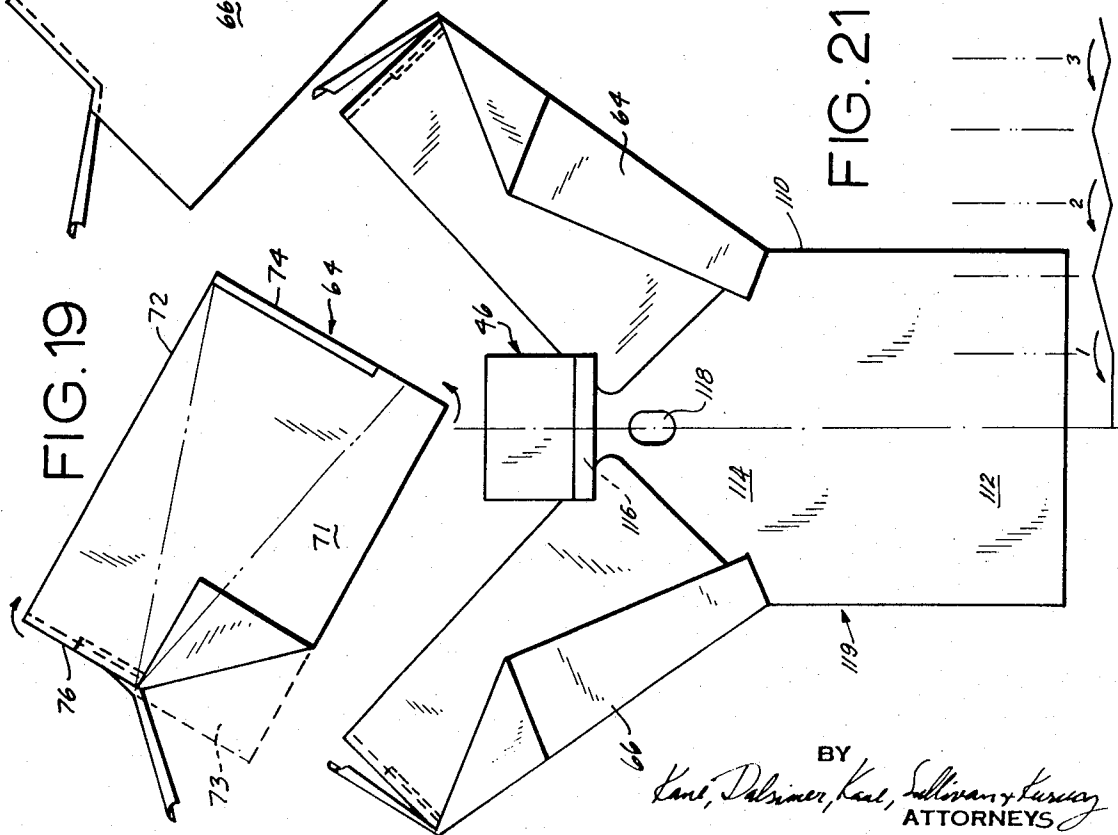
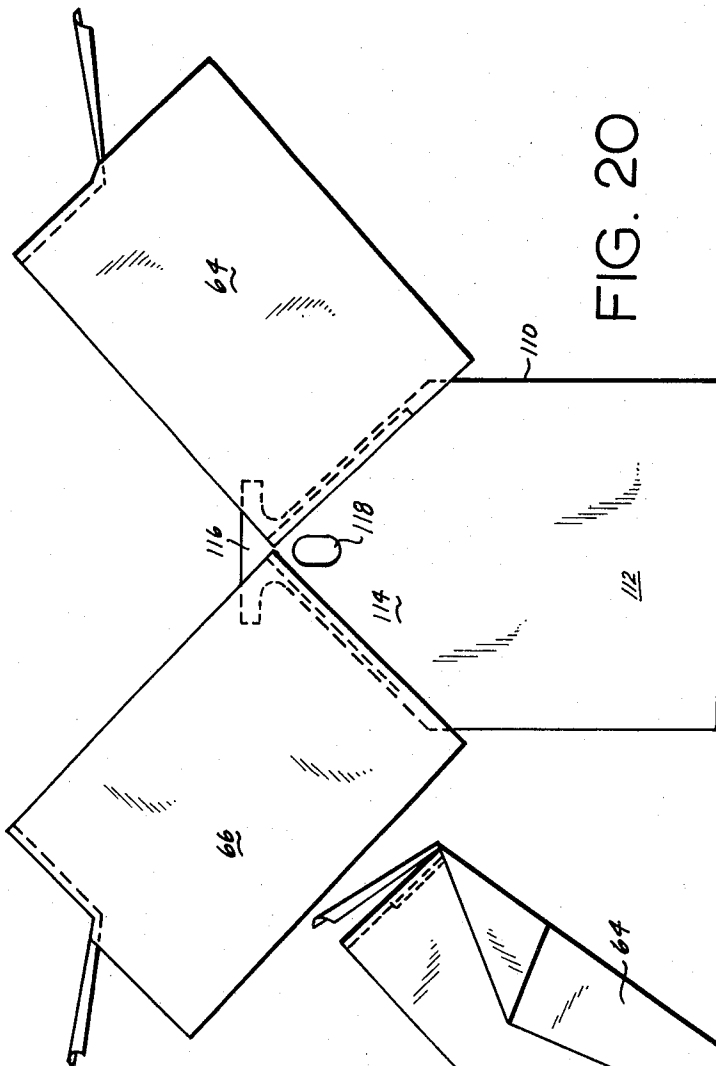


FIG. 16

FIG. 17

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FIG. 22

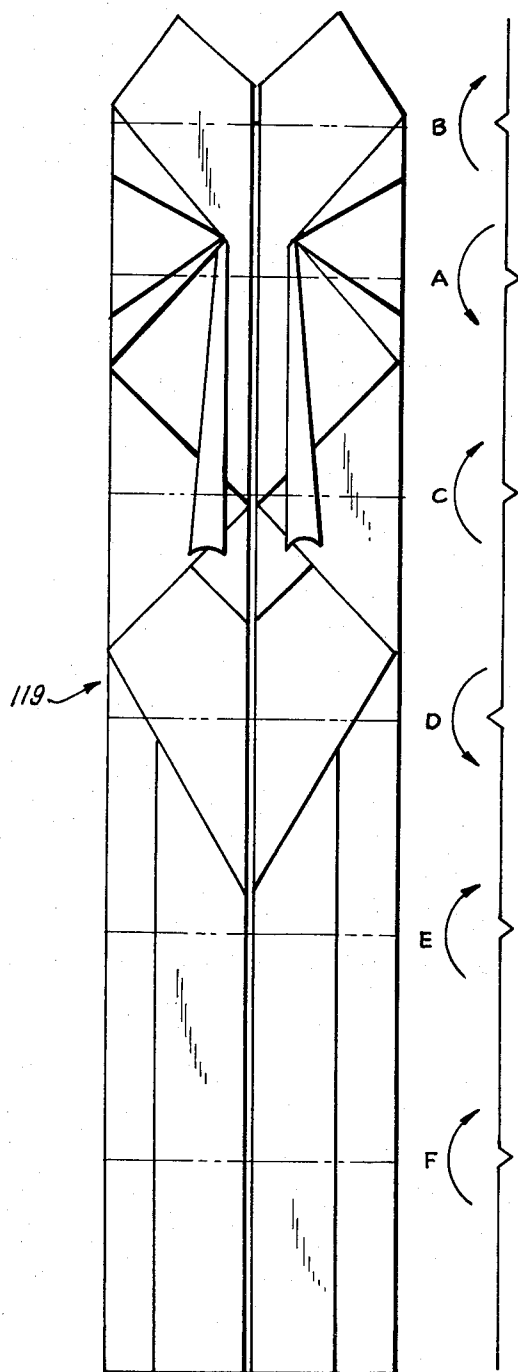
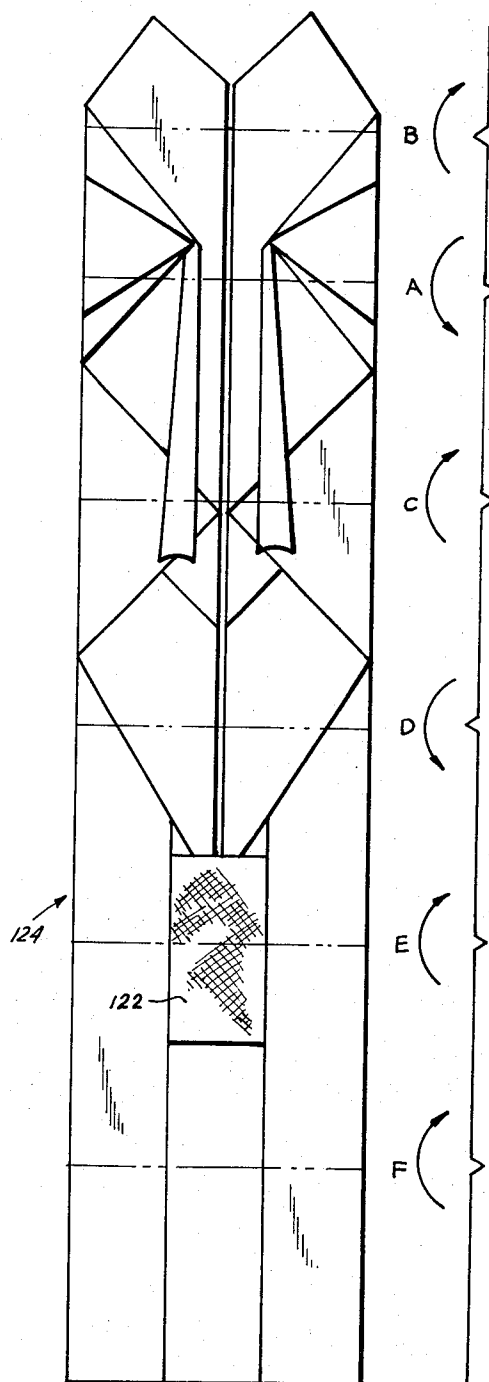


FIG. 25



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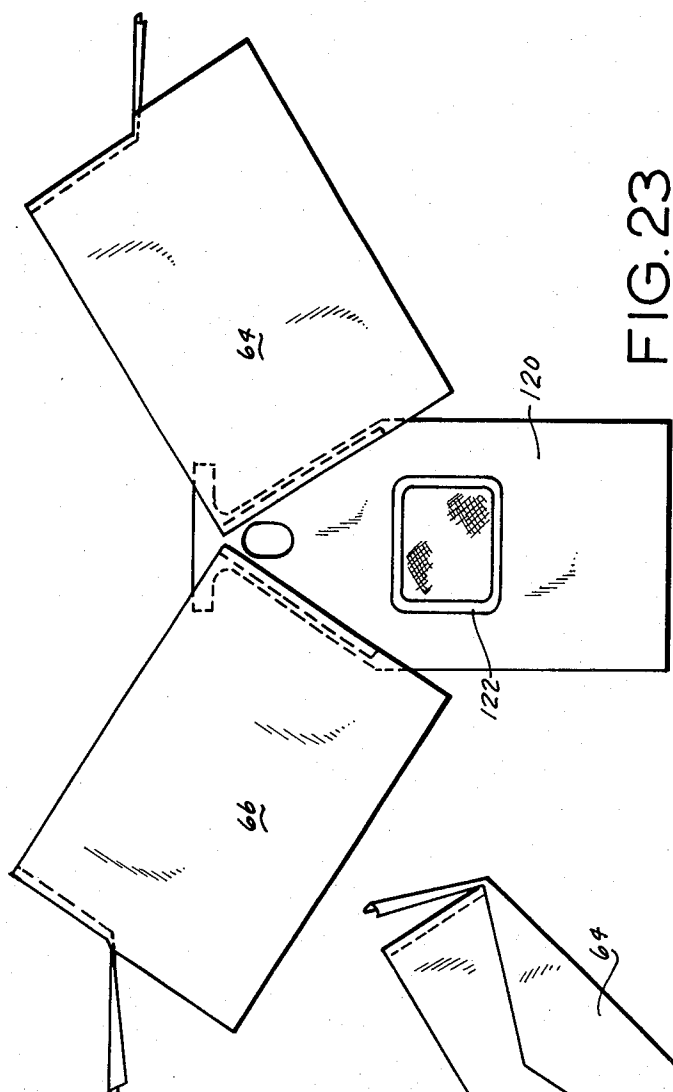


FIG. 23

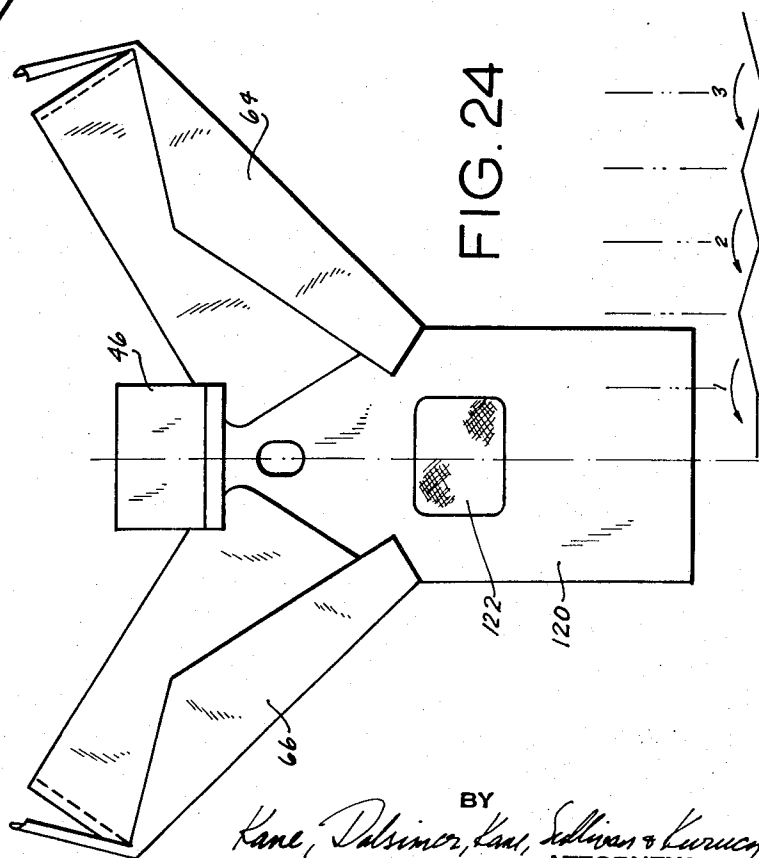


FIG. 24

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DISPOSABLE UNITARY SURGICAL DRAPE**BACKGROUND OF THE INVENTION**

In order to prepare a patient for obstetrical and other gynecological operative procedures, lithotomy or cystoscopic procedures, as with almost all operative procedures, the patient is draped in sterile coverings to prevent or minimize the possibility of contamination and infection of the operative area. In the main, such draping has heretofore utilized linens which required washing and sterilizing prior to use.

Some attempts at producing presterilized disposable nonwoven and/or plastic drapes have been made heretofore. However, the users of prior art disposable drapes have experienced difficulty in unfolding the drapes particularly in connection with the above specified procedures which require that a large area of the patients's body be protected. Such prior art drapes require that the drape be completely unfolded and then applied to the patient, often requiring that at least two persons apply the drape and that portions of the drape be exposed outside the sterile zone extending between the neck and waist of the doctor.

It is therefore the principal object of the present invention to provide an improved prefolded, disposable, surgical drape particularly well suited for obstetrical, cystoscopic and lithotomy operative procedures which is assembled and prefolded in such a manner as to facilitate the unfolding and application of the drape to a patient in situ.

A further object is to provide such a prefolded drape which unfolds in stages thereby minimizing or preventing errors in unfolding and contamination.

SUMMARY OF THE INVENTION

The above and other beneficial objects and advantages are attained in accordance with the present invention by providing a surgical drape comprising, in combination, a first generally rectangular abdominal sheet formed of a nonwoven material having a longitudinal fold parallel to one edge, a plurality of fan-folds from both transverse edges and a second longitudinal fold whereby to form a rectangular package having hand receiving pockets defined by the second longitudinal fold and those fan-folds appearing on an outer surface. A tail sheet comprising a second, generally rectangular sheet formed of plastic is affixed to the abdominal sheet oriented with its longitudinal axis perpendicular to that of the abdominal cover. Leggings comprising once folded rectangular sheets are affixed at the intersection of the two sheets by an adhesive along portions of a longitudinal edge of each legging extending from the fold line to a free transverse edge. The tail sheet and leggings are both fan-folded parallel to the longitudinal axis of the tail sheet from both edges. These last mentioned fan-folds are proportioned to align the outer folded longitudinal edge of the tail sheet and leggings with the outer edges of the folded abdominal sheet. The tail sheet and leggings are then transversely folded to form a package incorporating the folded abdominal sheet in such a manner as to permit the sequential unfolding of the package in situ to drape a patient. If desired, fenestrations and/or liners or padding may be provided to the abdominal cover or tail sheet as may be required by any particular surgical procedure.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a perspective view of a folded surgical drape formed in accordance with the present invention;

FIGS. 2-5 are perspective views illustrating the manner in which the surgical drape of FIG. 1 is unfolded in situ on a patient;

FIGS. 6-9 are plan views illustrating the sequential folding steps of the abdominal cover forming a portion of the presently disclosed surgical drape;

FIG. 10 is a fragmentary plan view illustrating the top or under-buttocks portion of the tail sheet prior to its assembly and the interconnection means between the tail sheet and abdominal cover;

FIG. 11 is a fragmentary view illustrating the interconnection of the folded abdominal cover and still unfolded tail sheet subsequent to the assembly of the under-buttocks portion of the sheet.

FIG. 12 is a plan view of a tail sheet particularly well suited for obstetrical procedures and integral leggings, the tail sheet is shown connected to the folded abdominal cover; this view also schematically illustrates the initial tail sheet folding steps;

FIGS. 13-18 are perspective views illustrating the subsequent steps for folding a surgical, obstetrical drape in accordance with the present invention;

FIG. 19 is a plan view illustrating the legging utilized in the present surgical drape;

FIG. 20 depicts a tail sheet and integral leggings particularly well suited for lithotomy procedures;

FIG. 21 is a view similar to FIG. 12 and depicts the lithotomy tail sheet of FIG. 20 connected to a folded abdominal cover and also indicates the initial folding procedures for this embodiment;

FIG. 22 corresponds to FIG. 13 for the folding of the lithotomy drape;

FIG. 23 depicts a tail sheet and integral leggings particularly well suited for cystoscopy procedures;

FIG. 24 corresponds to FIGS. 12 and 21 for the cystoscopy drape; and

FIG. 25 corresponds to FIGS. 13 and 22 for the cystoscopy drape.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is illustrated in the accompanying drawings wherein similar components bear the same reference numerals throughout the several views. Reference will first be made to FIGS. 1-19 wherein an obstetric drape is illustrated. Thereafter, the remaining FIGS. will be discussed which describe variations in the basic obstetric drape necessary to facilitate lithotomy and cystoscopy procedures. Thus, in FIG. 1 the surgical drape 10 of the present invention is illustrated in the folded compact condition in which it is supplied to hospitals. As will become evident forthwith, the drape includes integral abdomen cover sheet; tail sheet, and right and left leg leggings. The drape components are formed of plastic, nonwoven, cellulose, or other suitable material as required by the particular operative procedure which is to be performed. The folded drape is presterilized and packaged in a manner to insure sterility until the package is opened in the operating room.

As shown, the folded drape 10 comprises a relatively small and compact rectangular package which may readily be handled and positioned on a patient by a single nurse or doctor. The steps which must be performed to unfold the drape 10 in situ on a patient 12 are illustrated in FIGS. 2-5. To this end, the folded drape includes a properly identified top surface 14, and front and rear ends 16 and 18 respectively. The patient 12 is laid out on an obstetric table 20 in a standard manner with her legs maintained spread apart by stirrups 22 as shown in FIG. 2. The folded drape 10 is placed on the patient's lower abdomen. Thereafter, the nurse inserts her hand within the fold at the rear end 18 of the folded drape and pulls rearwardly as indicated by the arrow in FIG. 2, thereby unfolding the tail sheet 24 of the drape and providing access to the abdominal cover which is then unfolded toward the patient's head to provide access to leggings 26. Referring to FIG. 3, it is noted that the tail sheet 24 is pulled through the legs of the patient and draped over the pelvis. The leggings 26 which become exposed when the above described step is performed are then applied. To this end, the nurse first grasps the lift tab 28 of the right legging with her left hand and the right toe peak 29 with her right hand as shown in FIG. 3. Then, with a movement upward and outward toward the patient's toe, the legging is applied. The left legging is applied with the nurse's hands in the reverse position. Referring now to FIG. 4, after both leggings are applied to the patient in the manner indicated above, the tail sheet is adjusted and, if required by the surgery, the tail sheet is tucked under the buttocks of the patient. The final step of the undraping procedure is illustrated in FIG. 5, wherein the abdomen cover sheet 30 is draped over the abdomen of the patient and both sides of the operating table 20. It is to be noted that draping of both sides of the table is accomplished without requiring any movement of the patient or lifting of the drape. It is also to be noted that throughout the unfolding procedure the nurse never touches any inner surface (i.e. body contacting surface) of the drape thereby maintaining optimum sterility.

As was already mentioned, the present surgical drape comprises essentially four interconnected sections: an abdomen cover 30, a tail sheet 24 and two leggings 26. The following describes the folding and securing procedures necessary to obtain the folded drape 10 illustrated in FIG. 1. An abdominal cover sheet 30 comprising a generally rectangular sheet of a nonwoven fiber material is first folded along a line 32 generally parallel to the longitudinal axis of the sheet. With the minor portion 34 folded over the main body portion 36 of the abdomen cover, the sheet is fan-folded inwardly toward the center from edges 38 and 40 along fold lines 38a-38 and 40a-40c parallel to the transverse axis. The outermost panels, 39a and 41a, that is the panels defined by edges 38 and 40 and their respective first fold lines 38a and 40a thus appear on top of the stack of panels 39 and 41 defined by the remaining folds. The panels 39 and 41 thus rest side by side on opposite sides of the transverse center line 43 of the drape. The resultant partially folded abdominal cover sheet 45 is illustrated in FIG. 8. As a final folding step for the abdominal cover, the top portion 42 of the partially folded sheet 45 is then folded along line 44 parallel to

the top edge thereby resulting in the folded abdomen cover 46 illustrated in FIG. 9.

Referring now to FIGS. 10-12, the tail sheet 24 is illustrated. As shown in FIG. 12, tail sheet 24 comprises a generally rectangular main body member 48 which is formed of an impervious sheet of material such as polyethylene. A non-woven fabric backing member 50, the width of which is somewhat greater than that of the main body portion 48 of the tail sheet is provided adhered to the main body portion 48 adjacent the top edge 53 and extending downwardly for a short distance. An extension 55 of the tail sheet in the form of a generally trapezoidal portion 52 having an enlarged rectangular end 54 extends upwardly beyond top edge 53. The trapezoidal and rectangular portions 52 and 54 are formed integral with the tail sheet body member 48. A cutout 57 is centered in the trapezoidal portion 52 of extension 55. As will be explained forthwith, the shape of the extension and cutout are determined by the particular end use for the drape. As was previously mentioned, the drape of the preferred embodiment is intended for use in obstetrics and the extension and cutout are designed accordingly.

As a first step in assembling the tail sheet 24, the top of the main body portion is folded along line 56, parallel to the top edge 53 and bisecting the backing member 50. The two halves of the backing member are glued to one another along the adhesive zones provided in the main body portion 48 above fold line 56. The backing member 50 thus forms the outside of pockets 62 (left and right) which extends along the top edge of the tail sheet defined by the glue zones as illustrated in FIG. 11. The pockets form the portion of the tail sheet to be tucked under the buttocks of the patient. The backing member 50 comprises a nonwoven material and hence, is more comfortable to the patient than the plastic of the tail sheet. The backing member also provides a nonslip surface to be tucked under the patient and is stronger than the plastic, thereby enabling it to be subjected to more strenuous handling.

The extension 55 of the body portion is folded over the pocket in the manner shown in FIG. 11 whereafter the folded abdominal cover 46 is glued to the rectangular portion 54 forming an impenetrable liner for portions of the cover 46.

Referring now to FIG. 12, it is noted that right and left leggings 64 and 66 respectively are provided secured to the tail sheet extension 50 along the sides 68 and 70 of trapezoidal member 52 adjacent cutout 57. The leggings are illustrated separately in FIG. 19 and, since the leggings are identical, the description of those leggings will only be directed at legging 64. Legging 64 comprises a rectangular sheet of material folded about center line 72 parallel to the transverse axis. The two halves of the legging, 71 and 73, are affixed to each other along the longitudinal edge 76 for approximately one-half the total folded length of edge 76. A tab 28 formed of a strip of plastic extends from the joined section of the leggings. If desired, halves of the legging may also be supplied with an adhesive strip along the other outer folded edge 74. This is not necessary for the obstetric drape presently discussed. However, it is necessary for use in lithotomy and cystoscopy procedures. The leggings may be prefolded and placed on the tail sheet 24 with half 71 overlying half 73 and

with edge 74 generally aligned parallel to the sides of the trapezoidal member and glued in position. To this end, it should be remembered that for the present obstetrical drape, edge 74 is completely free enabling the bottom half 73 of the legging to be folded upwardly along a line extending from the beginning of tab 28 to the intersection of edge 74 and fold line 72 thereby exposing the undersurface of half 71. Adherence occurs along the undersurface of half 71. The unsecured portions 80 and 82 of the front and rear legging halves are then folded back as illustrated in FIG. 12. Legging 66 is attached and folded in an identical manner.

After the folded abdominal cover 46, tail sheet 24 and leggings 64 and 66 are affixed to one another, the combined drape is initially fan-folded inwardly from the outer extremities of the leggings and tail sheet along fold lines parallel to the longitudinal axis of the tail sheet thereby forming two pluralities of longitudinally extending panels overlying the center of the tail sheet. Accordingly, the outermost portion 84 of legging 64, including tab 28, is first folded over along fold line 86a and then subsequently fan-folded accordion-style along lines 86b, 86c and 86e. Those portions of the tail sheet within the fold lines are folded along with the legging. The width of panels 87a through 87e defined by adjacent fold lines and the free edge 84 are proportioned so that fold line 86e aligns substantially with the edge 88 of the folded abdominal cover 46. Legging 66 and its associated portion of the tail sheet is then identically folded, resulting in the elongated partially folded drape of FIG. 13.

Folding then proceeds along lines transverse to the longitudinal axis of the tail sheet, as illustrated in FIGS. 14-18 which are indexed to FIG. 13, dividing the tail sheet and leggings into sections. Thus, the upper section 90 of the fan-folded leggings and tail sheet is first folded downwardly along fold line 92 thereby exposing the folded abdominal cover 46. The top portion 42 of the abdominal cover is then unfolded as shown in FIG. 15 and then refolded along line 92 over the top section 90 of the leggings and tail sheet as shown in FIG. 16. Thereafter, the bottom part of the drape is folded along lines 95 and 98 bringing sections 97 and 99 over the folded top portion 42 of the abdominal cover. The bottom section 100 of the tail sheet is then folded over the next to bottom section 101 along line 102 and then the final fold is made along line 104 to bring these last sections over the folded abdominal cover sheet as illustrated in FIG. 18, thereby producing a compact drape. To unfold the drape, the folding procedure of FIGS. 14-18 is reversed to enable draping to be accomplished as illustrated in FIGS. 2-5.

As was previously mentioned, the particular drape described in the foregoing was designed for obstetrical purposes and accordingly, a pad 106 of absorbent material is positioned centrally on the tail sheet.

In FIG. 20, a tail sheet 110 especially designed for lithotomy procedures is illustrated. The lithotomy tail sheet 110 comprises a generally rectangular main body portion 112 with a triangular top portion 114. The sides of the triangular portion comprise extensions of the longitudinal edges of the main body portion. A narrow rectangular extension 116, extends beyond the apex of the triangular portion oriented perpendicular to the longitudinal axis of the main body portion. An oblong

opening 118 is provided. The leggings 64 are as shown in FIG. 19 and are affixed to the tail sheet parallel to the sides of the triangular portion.

As shown in FIG. 21, the folded abdominal sheet 46 is affixed to the rectangular extension 116 of the tail sheet. Folding of the combined drape is essentially the same as that for the obstetrical drape. Accordingly, the leggings and tail sheet are first fan-folded as indicated on FIG. 21. The partially folded lithotomy drape 119 is then transversely folded as indicated in FIG. 22 which is substantially identical to FIG. 13.

FIG. 23 depicts a tail sheet 120 designed especially for use in cystoscopy procedures. This tail sheet is similar to the tail sheet 110 of the lithotomy drape except for the provision of a screened fenestrated area 122 in the approximate center of the drape. The screen is necessary to permit rapid drainage during the operative procedure and to protect the surgeon. As shown in FIG. 24, the folded abdominal cover 46 is attached to tail sheet 120 and the combined sheet is fan-folded in exactly the manner used for the lithotomy drape. FIG. 25 shows that the final folding steps for the cystoscopy drape 124 is also identical to those for the obstetric and lithotomy drapes.

Thus, in accordance with the above an improved, folded, disposable drape is provided including integrally an abdomen cover, tail sheet and leggings which is adapted to be unfolded in situ directly on a patient.

In summary then, a disposable, prefolded, surgical drape is provided adapted to be unfolded in situ on a patient. The drape includes an abdominal cover, a tail sheet, and a pair of leggings. Each of the components is fan-folded in a manner to enable its unfolding in sequence on a patient.

It should be realized that although a specific embodiment of the invention has been described and illustrated, various changes therein will become evident to those skilled in the art and therefore the invention is to be determined only by the scope of the appended claims.

Having thus described the invention what is claimed is:

1. A prefolded, disposable, surgical drape adapted to be unfolded in situ on a patient without requiring that the drape be lifted from the patient or that the surface of the drape which comes in contact with the patient be touched during the unfolding procedure, said drape including in combination:

an abdominal cover comprising a generally rectangular sheet including a major portion and minor portion separated by a fold line parallel to the longitudinal axis with the minor portion overlying the front surface of the major portion and the sheet fan-folded along lines parallel to the transverse axis dividing the cover into two pluralities of panels overlying the top surface thereof to form a partially folded cover;

a tail sheet comprising a generally rectangular sheet of material aligned with its longitudinal axis perpendicular to the longitudinal axis of the abdominal cover and secured to the partially folded cover along the top edge of said tail sheet, said tail sheet longitudinal edges originally extending beyond the transverse edges of said partially

folded abdomen cover and fan-folded along lines parallel to its longitudinal axis so as to produce two pluralities of longitudinally extending tail sheet panels, the outermost edges of said longitudinal panels being substantially aligned with the transverse edges of said partially folded abdomen cover;

a pair of leggings, each of said leggings being secured to said tail sheet and abdominal cover proximal the interface of said cover and sheet, said leggings each comprising a generally rectangular sheet of material having a longitudinal axis angularly disposed with respect to both said abdomen cover and tail sheet longitudinal axes, said leggings being at least partially folded along with said tail sheet into said longitudinal panels;

said drape further comprising a plurality of folds parallel to the transverse axis of said tail sheet dividing said tail sheet and leggings into a plurality of sections, at least one fold line extending across the partially folded abdomen cover parallel to said tail sheet transverse fold lines dividing said partially folded abdomen cover into a top section and a bottom section, said partially folded so that said top section overlies said bottom section and at least one section of said tail sheet and the remaining sections of said tail sheet plurality being folded to overlie both said top and bottom abdomen cover sections.

2. The invention, in accordance with claim 1, wherein each of said leggings comprises a generally rectangular sheet of material folded in half along a line parallel to the transverse axis dividing said sheet into a top layer overlying a bottom layer and including a free transverse edge, a pair of longitudinal edges extending between said fold line and said free transverse edge, a seam extending along one of said longitudinal edges from said fold line toward said free edge for a minor portion of said longitudinal edge joining said top and bottom layers, and a tab forming an extension of said seam, wherein said legging is affixed to said tail sheet and abdominal cover along said other longitudinal edge.

3. The invention, in accordance with claim 2, 45

wherein said legging layers are joined to one another along the major portion of said other longitudinal edge.

4. The invention in accordance with claim 2, wherein said leggings extend beyond the top edge of said partially folded abdomen cover and beyond the longitudinal edges of the originally unfolded tail sheet.

5. The invention, in accordance with claim 1, wherein said tail sheet further includes an extension beyond the top edge thereof, a trapezoidal cutout centrally disposed within said extension and said leggings are affixed to said extension substantially parallel to the sides of said cutout.

6. The invention, in accordance with claim 2, wherein said abdomen cover and leggings are formed of a nonwoven material and said tail sheet is formed of a moisture impervious, plastic material.

7. The invention, in accordance with claim 6 further comprising a backing member of nonwoven material extending downwardly from the top edge of said tail sheet for a minor portion of the length of said tail sheet, said backing member including margins extending beyond the longitudinal edges of said sheet, a fold line parallel to the transverse axis of said sheet substantially bisecting said backing member wherein said minor portion is sides over said fold line and the margins on opposite side of said fold line are glued to one another whereby to define a pocket proximal said tail sheet top edge.

8. The invention, in accordance with claim 7 further comprising a pad of absorbent material centrally disposed on said tail sheet.

9. The invention, in accordance with claim 3, wherein said tail sheet includes a generally rectangular main portion and a triangular portion extending upwardly from said main portion, the sides of said triangular portion comprising extensions of the longitudinal edges of said main portion, an oblong cutout disposed within said triangular portion extending along the altitude thereof, and said leggings are affixed to said triangular portion substantially parallel to the sides thereof.

10. The invention, in accordance with claim 9, further comprising a screen overlying a cutout section of said main portion.

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