United States Patent [19]

Patience et al.

[11] **3,707,964**

[45] **Jan. 2, 1973**

[54] **SURGICAL DRAPE WITH HAND RECEIVING CUFF HAVING INTERNAL STOP GUIDES**

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[73] Assignee: **The Kendall Company,** Boston, Mass.

[22] Filed: **June 20, 1970**

[21] Appl. No.: **56,679**

Related U.S. Application Data

[63] Continuation of Ser. No. 804,596, March 5, 1969, abandoned.

[52] **U.S. Cl.** ..... **128/132 D, 128/157**

[51] **Int. Cl.** **A61f 13/00**

[58] **Field of Search** ..... 128/132 D, 292, 157

[56] **References Cited**

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Assistant Examiner—G. F. Dunne
Attorney—Robert D. Chodera and Martin Kirkpatrick

[57] **ABSTRACT**

A surgical legging drape having a generally trapezoidal configuration, and provided with an enlarged cuff surrounding the open end thereof, to function as a receiving pocket for the nurse's hands. The drape is folded in a unique manner such that a portion of the cuff covers a substantial area of the top panel. Seal lines provided at specified internal points along the cuff function as internal stop guides for the nurse's hands to permit the drape to bow and droop forward when unfolded and opened.

9 Claims, 10 Drawing Figures

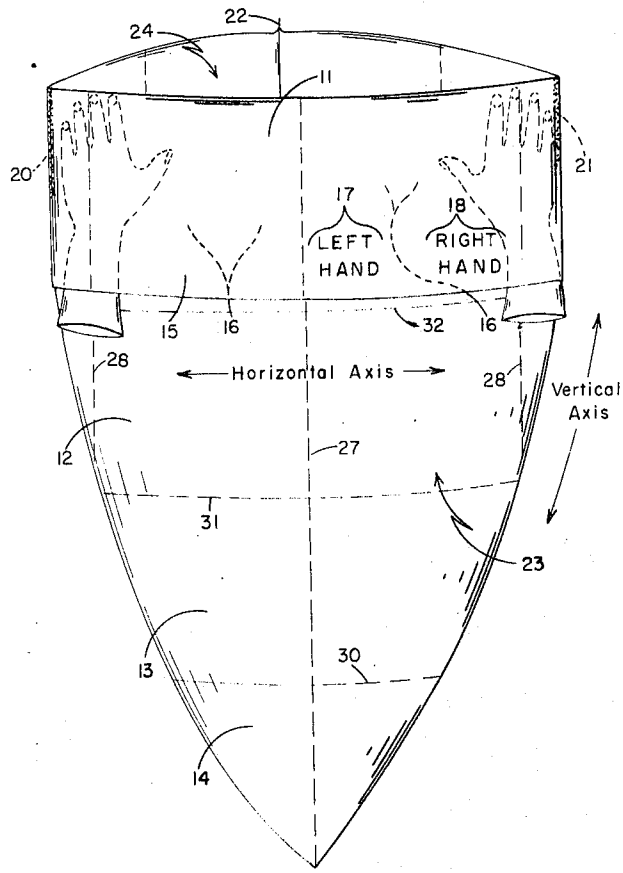
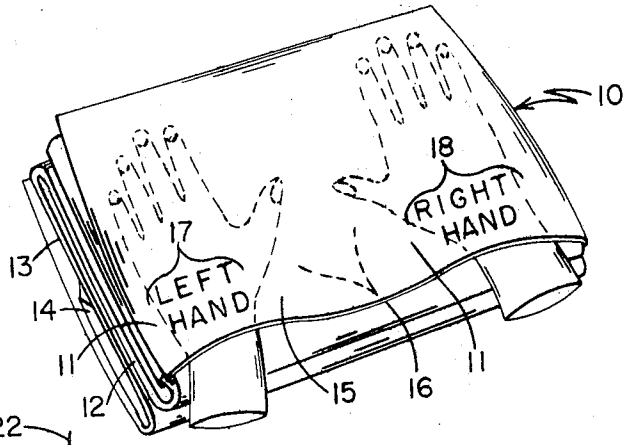


FIG. 1


10
18
RIGHT HAND
17
LEFT HAND
13
14
11
12
15
16
11

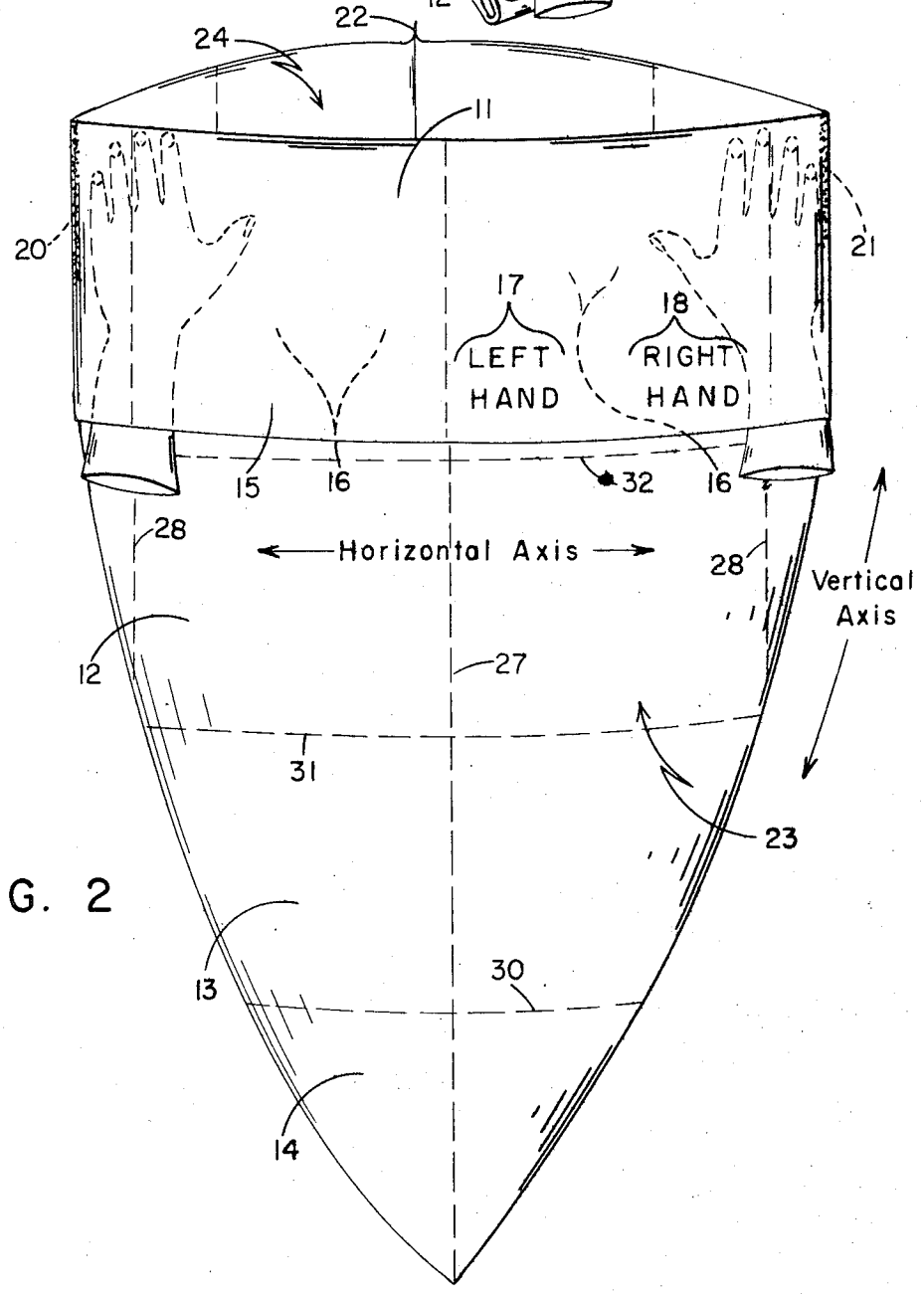

22
24
11
20
21
17
LEFT HAND
18
RIGHT HAND
15
16
32
16
28
Horizontal Axis
28
Vertical Axis
12
27
31
23
13
30
14

FIG. 2

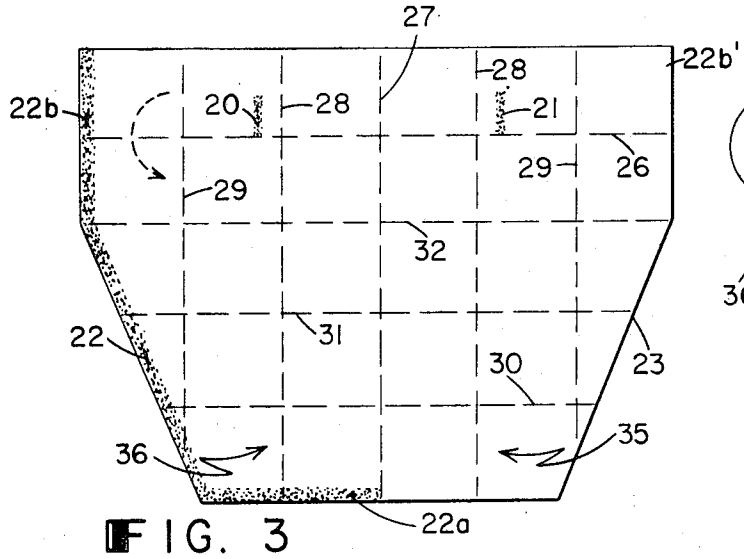


FIG. 3

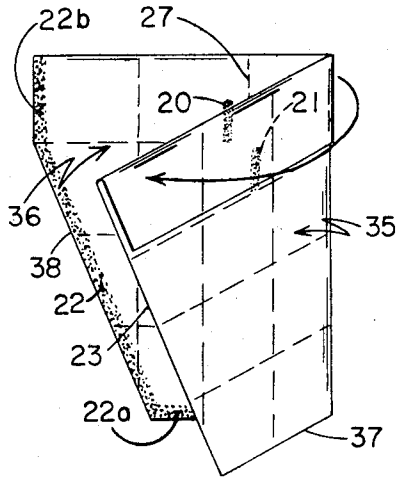


FIG. 4

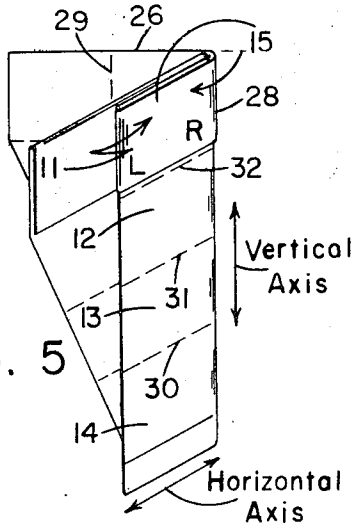


FIG. 5

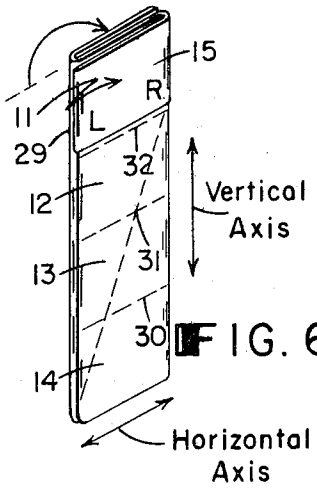


FIG. 6

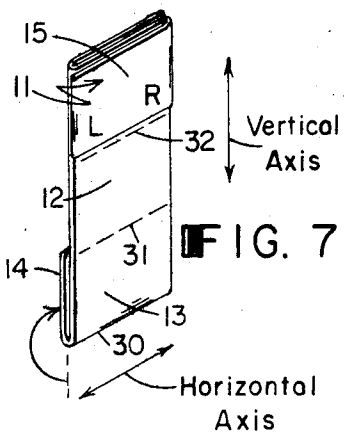


FIG. 7

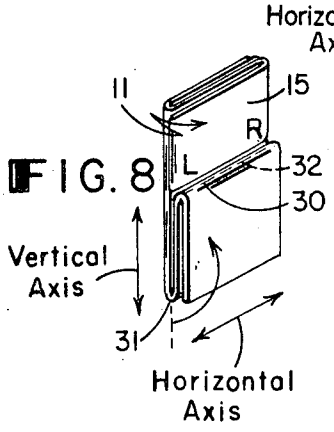


FIG. 8

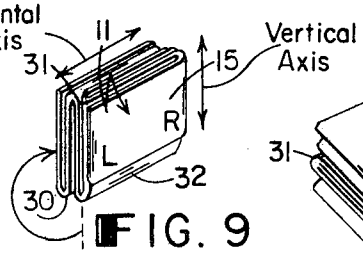


FIG. 9

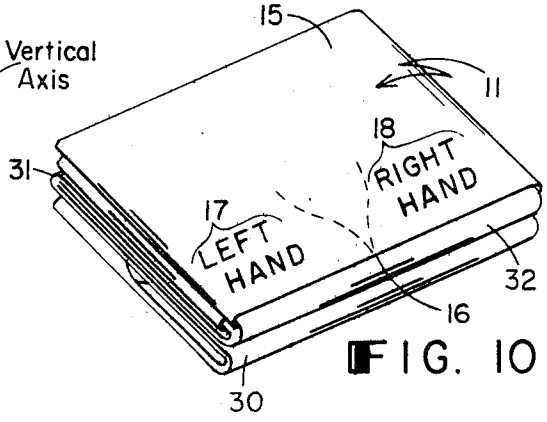


FIG. 10

SURGICAL DRAPE WITH HAND RECEIVING CUFF HAVING INTERNAL STOP GUIDES

This application is a continuation of copending application Ser. No. 804,596, filed Mar. 5, 1969, now abandoned.

This invention is directed to a novel surgical drape, particularly of the legging type, provided with an enlarged cuff with internal stop-guides and surrounding the open end thereof and folded in a unique manner to accommodate the enlarged cuff while yet facilitating manipulating and further insuring sterility.

The draping of patients preliminary to surgery has traditionally been, and still remains, one of the first steps in any surgical procedure. A major purpose for draping a surgical patient is generally to prevent the prepared area of surgical interest from becoming contaminated by contact with unprepared areas or surfaces. Hence it is necessary that the drapes be completely sterile themselves and that they be capable of manipulation to prevent contamination during the draping procedure. Furthermore, they must be designed in such a manner as to resist slipping or sliding off the patient once arranged in the desired position.

It is now becoming the practice of hospitals to use prepackaged surgical drapes which are generally disposable, the same being made of synthetic fabrics. It is therefore clear that such packages must be compact, easy to open and allow ready access to a prefolded drape minimizing the dangers of contamination during removal from the package and subsequent unfolding and draping.

The manner of handling a drape assumes significant importance when considered in view of the fact that most surgical drapes are pre-folded and packaged prior to use and must be unfolded and manipulated in the operating room while maintaining sterility at all times. The primary danger which should be avoided is contact between the drape portion in contact with the patient's skin and any other surface such as a gloved hand, or the nurse's surgical gown and the like. To solve this problem, a hand receiving cuff has been provided along that edge of the drape which is to be grasped. The cuff provides convenient receiving pockets into which a nurse may insert here hands to grasp and manipulate the drape. In this manner, the only portion of the drape touched by the nurse's gloved hand is the portion on the underside of the cuff thereby providing an effective barrier between the handled area of the drape and the sterile area of surgical interest.

Such type of surgical legging drape is described in U.S. Pat. No. 3,335,719, directed to a surgical legging drape having a cuff surrounding the open end thereof, and folded such that the cuff is exposed on the front panel of the folded drape with a portion of the cuff folded congruently forward to define a flap-like fold overlying a portion of the front panel. To unfold the drape, the nurse inserts her left hand under the front panel cuff and her right hand in the flap-like folded-over cuff such that one hand grasps the front panel and the other hand grasps the back side of the front panel.

Although this type of folded drape has met with a modicum of success, various difficulties have been encountered with the drape described in the U.S. Pat. No. 3,335,719. The primary difficulty lies in the relative dimensions of the cuff, which is necessarily limited in depth such that the receiving pockets formed thereby will not accommodate the nurse's entire hand, resulting in the danger that at least a portion of the nurse's gloved hand will contact a portion of the drape resulting in possible contamination. Furthermore, the limited width of the cuff reduces the size of the receiving pockets, increasing the danger of the drape slipping off the nurse's hands while unfolding and manipulating same. Nor is it possible to widen the cuff shown in the U.S. Pat. No. 3,335,719 due to the manner in which the drape is folded. If the cuff were widened to enlarge the receiving pockets, it would become extremely difficult if not impossible to insert the right hand in the folded-over flap-like portion of the cuff. And, finally, the manner in which the drape is folded necessarily requires the nurse to insert her left hand in the receiving pocket directly forward of her body, while the right hand must be inserted at a 90° angle with respect to the left hand so that while unfolding the drape, both the front and back panels may be grasped. This procedure is quite awkward for the nurse and further increases the difficulty of handling the drape during the unfolding and draping operation. Furthermore, the drape does not open to the full extent desired for ease of application to the patient.

It is therefore one object of this invention to provide a novel surgical drape having an enlarged cuff surrounding the open end thereof to provide an enlarged receiving pocket having novel internal stop-guides therein.

Another object is to provide a surgical drape having an enlarged cuff having such stop-guides and surrounding the open end thereof and folded in such a manner as to accommodate the enlarged cuff while still facilitating grasping, unfolding and manipulating the drape.

A further object is to provide a surgical drape having an enlarged cuff surrounding the open end thereof, said cuff having seal lines provided at specified points transversing said cuff to guide the nurse's hands during the unfolding and draping operation.

A still further object is to provide a folded surgical drape exposing at its top surface an enlarged receiving pocket for easy access by a nurse or other user with the left and right hands in flat parallel side-by-side relationship on the same side of the folded drape, said cuff having seal lines at specified points transversing the cuff to guide the hands of the nurse while unfolding same, said seal lines being positioned at predetermined points with respect to each other and the center seal line of the drape so as to permit the drape to droop and bow forward when unfolded, thus simplifying application of the drape to the patient when unfolded.

These and other objects and advantages may be realized according to this invention. The drape described herein is provided with an enlarged cuff surrounding the open end thereof to permit the insertion of not only the entire hand of the nurse, but also a portion of the wrist during the unfolding operation, with the hands in flat parallel side-by-side relationship on the same side of the folded drape. The drape of this invention is preferably accordian-folded along its vertical axis into quarters of substantially equal dimensions. It is then folded along its horizontal axis into three panels; a front panel, middle panel, and back panel. Each of the panels

carries a portion of the cuff along its top edge although in its folded position only the portion of the cuff carried by the front panel is exposed to access by the nurse, such that the top panel consists essentially of the cuff portion. To unfold the drape, both the left and right hands are inserted under the top cuff directly forward of the nurse's body. The drape package may then be raised from the table thereby causing the drape to unfold vertically. The nurse may then slide here hands in opposite directions along the cuff thereby unfolding the drape along its horizontal axis. Transverse seal lines across the cuff attaching the cuff to the underlying panel at predetermined points off-center with respect to each other and the center seal line of the drape provide convenient internal hand stop guides for the nurse's hands as they are slid along the cuff. When the hands reach these stop guides, the drape is fully unfolded and the open end thereof is caused to droop or bow forward for convenient application to the patient. Preferably, the surgical legging drape hereof is provided having a generally trapezoidal configuration closed on all sides excepting the top, through which the leg or arm is inserted and around which the enlarged cuff is provided. This construction provides a drape which is conservative of material, conforms more closely to the contour of the limbs, simplifies manipulation, and finally, avoids the danger of contamination and tearing by eliminating slits or other open edges.

The nature of this invention will be better understood by reference to the attached drawings and the following description, which illustrate only a few of the embodiments contemplated by this invention and are not intended to limit this invention thereby. For the sake of convenience, like numerals are used to designate like elements.

FIG. **1** illustrates a surgical drape in folded form having an enlarged cuff exposed on the top panel with the hands of a nurse shown in position schematically;

FIG. **2** shows a legging drape in the completely unfolded state;

FIG. **3** is a plan view of a drape panel in the unfolded and unsealed state with all the fold lines shown by way of transversing lines;

FIGS. **4** through **10** illustrate the various stages in the folding of the drape.

Referring now to FIG. **1**, there is shown a folded surgical drape **10** consisting of a trapezoidal sheet of several panels **11, 12, 13** and **14** folded over upon one another. A substantial portion of the front panel **11** consists of the enlarged cuff **15** having suitable printed hand positioning indicia **17, 18** which thereby provides a receiving pocket **16** to receive the hands of a nurse or medical aide in flat, parallel side-by-side relationship on the same side of the folded drape. A fully extended legging type drape is illustrated in FIG. **2**. The nurse in accordance with LEFT HAND indicia **17** and RIGHT HAND indicia **18** inserts her hands into the receiving pocket **16** provided by the cuff **15** as shown in FIG. **1**. By raising her arms, the drape unfolds along its vertical axis. Finally, by sliding her hands along the horizontal axis of the drape under the cuff **15**, the drape is caused to open along the horizontal axis and is ready for use.

According to the present invention, in order to facilitate opening of the drape along its horizontal axis, cuff attaching stop guides in the form of seal lines **20, 21** are provided adjacent the bottom edge of the cuff sealing the cuff to the body **23** of the drape. These seal lines **20, 21** function as stop guides for the nurse's hands as they are slid along the horizontal axis **18** under the cuff and are positioned such that when the hands reach the stop guides, the drape will droop and bow outward, thereby forming an opening **24** through which the limb to be draped is inserted.

In order to form a closed-end cylindrical-like legging drape, the drape panel **23** is folded over upon itself at vertical median line **27** (see FIG. **3**) forming a doubled panel having two equal half portions **35, 36**. These portions **35, 36** are sealed together along a seal line **22, 22*a*** to seal the bottom **37** and side **38** of the drape panel **23**, leaving an open ended top. The stop guide seal lines **20, 21** are positioned on opposite sides of vertical median line **27** at positions spaced from one another by a distance substantially less than half of the length of the top edge of the panel **23**, so that cuff **15** extends along the top of the panel on the outside thereof for a substantial transverse distance on each side of said vertical median line free from connection to said panel adjacent its bottom edge except adjacent its top edge for a substantial distance on each side of said vertical median line, preferably, out to said stop guide seal lines, wherein one of said stop guide seal lines, herein shown as **21**, is positioned closely adjacent one of said indicia, herein shown as right hand indicia **18**, and the other of said stop guide seal lines, herein shown as **20**, is positioned a substantial distance from the other of said indicia, herein shown as left hand indicia **17**. Both indicia **17** and **18** are positioned between said seal lines. This construction results in the drooping and bowing outward of the opposite side of opening **24** when the hands are slid along the cuff **15** to the stop-guide seal lines **20, 21**.

FIG. **3** shows the trapezoidal drape panel **23** to be a unitary piece of fabric of either the woven or non-woven variety having a top edge, a shorter bottom edge parallel thereto and two side edges. The cuff **15** of the drape is formed by folding over the transversely extending top edge portion of the drape along the line **26** upon and overlying said panel preferably for the entire width thereof forming the overlapping cuff **15** along the top of panel **23**. Seal lines **22*b*, 22*b'*** are provided along the edges of the drape for sealing the folded-over portion to the drape panel **23**. The side **38** and bottom **37** are also provided with seal lines **22, 22a**. The drape **23** is first folded in half along the vertical median line **27**, halving the panel **23** and bringing the two side edges and the respective bottom edges substantially into edge-to-edge relationship with the overlapping cuff **15** on the outside of the folded panel. The seal lines are then activated to seal the side and bottom edges along the full length thereof, providing a doubled panel with an open-ended top with an outside cuff **15** having an open bottom edge free from connection to said panel adjacent its bottom edge except along its top edge for a substantial distance on each side of said vertical median line **27**. When the cuff **15** is formed by sealing along seal lines **22*b*, 22*b'***, the stop guide seal lines **20, 21** are also caused to seal against the respective portions of the drape panel, as shown more clearly in FIG. **4**. The drape is now in condition to be folded as provided by this invention to prepare a prefolded, prepackaged sterile drape.

FIGS. 5 through 10 illustrate the sequence of folds contemplated by this invention. A first vertical fold is made parallel to and spaced from median line 27 along line 28 folding the drape upon itself through a 180° angle. The remaining portion of the drape is again similarly folded along line 29 in a reverse fold through a 180° angle, as more clearly shown in FIG. 6. These two folds complete the folding pattern along the vertical axis of the drape. A first fold along the horizontal axis parallel to the bottom edge of cuff 15 is made at line 30 folding the drape through a 180° at line 30. The balance of the drape is preferably accordion folded along consecutive equidistant parallel lines 31 and 32 thereby forming four equal drape panels (see FIGS. 7, 8 and 9) 11, 12, 13 and 14. The top panel 11 is formed by the last fold made along line 32, preferably somewhat below but at least not above the bottom edge of cuff 15. The top panel 11 forming one exposed surface of the folded drape, has a folded edge defined by median line 27 and exposes a transverse portion of the enlarged cuff 15 including its top and bottom edges, across the entire folded width of panel 11 with the positioning indicia 17 and 18 for the left and right hand, respectively, adjacent the left and right edges of panel 11. One and preferably both of the stop guide seal lines 20 and 21 are positioned on another surface of the folded drape to provide a receiving pocket 16 of desirably narrow folded width into which the nurse inserts her left and right hands in flat, parallel side-by-side relationship on the same side of the folded drape as shown in FIG. 1 for sterile unfolding of said drape by opposed lateral spreading movement of the hands to said seal lines to open the folded drape with the bottom edge portion of its opening drooping away from the top edge portion, which extends generally straight between the spread hands, as shown in FIG. 2.

The cuff 15 forming the receiving pocket 16 covers substantially the entire top panel 11 and is therefore sufficiently large to accommodate the entire hand and a portion of the wrist of the nurse and the stop guide seal lines make possible positive control of the drape. These features insure against the accidental slipping off of the drape from the hands of the nurse during the unfolding and draping maneuvers. Furthermore, sterility is more assured since the enlarged cuff together with the seal lines provides adequate surface area for grasping the drape, simplifying controlled manipulation of the drape. Hence, contact between the drape and unprepared areas is minimized while at the same time, a good barrier is provided between the nurse's hands and the main body of the drape. Finally, the folding pattern provides a simple but efficient manner of unfolding the drape without at the same time necessitating an awkward folding pattern of the top panel of the prefolded drape as shown in U.S. Pat. No. 3,335,719 and opens the drape into a novel drooping configuration for easy application to the patient. The invention has particular applicability to a legging type surgical drape. For this application, the drape is preferably trapezoidal in design being biased along one of the vertical edges. This design is more conservative of material and therefore more economical to manufacture while at the same time, more clearly approximating the shape of the human limbs which are to be draped. Furthermore, there is less material at the extremities of the limbs where excessive drape material is not necessary thereby minimizing the likelihood of the material bunching and interfering with the surgeon during the surgical procedure.

However, it is to be understood that although this invention has particular applicability to legging type surgical drapes as described, the provision of an enlarged cuff with the internal stop guides and the folding pattern designed to accommodate an enlarged cuff in a prefolded drape as disclosed herein is equally applicable to various other types of prefolded drapes.

The seal lines provided in the drape panel are most conveniently provided in the form of glue lines which are spread onto the drape panel during the manufacturing procedure. However, other sealing means may be employed in the manufacture of these drapes depending upon the fabric utilized for the drapes. For example, stitching may be employed as sealing means for woven fabric drapes as well as non-woven fabrics. The particular sealing means employed is not deemed to be a critical part of this invention so long as the particular sealing means utilized results in a secure seal line.

Although specific reference has been made to disposable drapes formed of a non-woven fabric, it is to be understood that this invention is equally applicable to drapes formed of other fabrics including woven and non-woven, whether disposable or non-disposable. The particular fabric of which the drapes are composed is again not critical to the utilization of this invention.

Others may practice this invention in any of the numerous ways which will be suggested to one skilled in the art upon reading this disclosure. All such practice is considered to be covered hereby provided it falls within the scope of the appended claims.

What is claimed is:

1. A surgical drape comprising

a four-sided panel having a top edge, a bottom edge and two side edges,

a first fold along the vertical median line of said panel halving said panel and bringing the two side edges and respective bottom edges substantially into edge-to-edge relationship,

panel sealing means sealing said side and bottom edges to provide a doubled panel with an open ended top,

an overlapping cuff along the top of said panel on the outside thereof extending for a substantial transverse distance on each side of said vertical median line free from connection to said panel adjacent its bottom edge except adjacent its top edge for a substantial distance on each side of said vertical median line, and

cuff attaching stop means adjacent the bottom edge thereof attaching said cuff to said panel, said stop means being positioned on opposite sides of said vertical median line at positions spaced from one another by a distance substantially less than half the length of the top edge of said panel.

2. The surgical drape of claim 1 wherein said panel sealing means seals said side and bottom edges along the full length thereof to provide a doubled panel with an open ended top.

3. A folded surgical drape comprising

a four-sided panel having a top edge, a bottom edge and two side edges

a first fold along the vertical median line of said panel halving said panel and bringing the two side edges and respective bottom edges substantially into edge-to-edge relationship

panel sealing means sealing said side and bottom edges to provide a doubled panel with an open ended top

an overlapping cuff along the top of said panel on the outside thereof extending for a substantial transverse distance on each side of said vertical median line free from connection to said panel adjacent its bottom edge except adjacent its top edge for a substantial distance on each side of said vertical median line

cuff attaching stop means adjacent the bottom edge thereof attaching said cuff to said panel, said stop means being positioned on opposite sides of said vertical median line at positions spaced from one another by a distance substantially less than half the length of the top edge of said panel

at least one fold along a line parallel to and spaced from said vertical median line with said double panel folded upon itself

at least one fold along a line parallel to and spaced at least not above said overlapping cuff bottom edge

one surface of said folded drape exposing a transverse portion of said cuff including its bottom edge across the entire folded width thereof to provide a receiving pocket for the left and right hands in flat parallel side-by-side relationship on the same side of the folded drape for sterile unfolding of said drape by opposed lateral spreading movement of the hands to said stop means to open said drape with its opening drooping away from the top edge portion extending between the spread hands.

4. A folded surgical drape as claimed in claim 3 wherein said one surface of said folded drape includes positioning indicia for the left and right hand respectively with said stop means positioned outside of said positioning indicia.

5. A folded surgical drape as claimed in claim 4 wherein one of said stop means is positioned closely adjacent one of said indicia and the other of said stop means is positioned a substantial distance from the other of said indicia and on another surface of said folded drape than said one surface.

6. A folded surgical drape comprising

a four-sided panel having a top edge, a bottom edge and two side edges

the transversely extending top edge of said panel being folded over upon and overlying said panel for the entire width thereof forming an overlapping cuff along the top of said panel

a first fold along the vertical median line of said panel halving said panel and bringing the two side edges and respective bottom edges substantially into edge-to-edge relationship with said overlapping cuff on the outside of said folded panel

panel sealing means sealing said side and bottom edges along the full length thereof providing a doubled panel with an open ended top with an outside cuff having an open bottom edge free from connection to said panel adjacent its bottom edge except along its top edge for a substantial distance on each side of said vertical median line

cuff attaching stop means adjacent the bottom edge of said cuff attaching said cuff to said panel, said stop means being positioned on opposite sides of said vertical median line at positions spaced from one another by a distance substantially less than half the length of the top edge of said panel

at least one fold along a line parallel to and spaced from said vertical median line with said double panel folded upon itself

at least one fold along a line parallel to and spaced at least not above said overlapping cuff bottom edge

one surface of said folded drape exposing a transverse portion of said cuff including its bottom edge across the entire folded width thereof to provide a receiving pocket for the left and right hands in flat parallel side-by-side relationship on the same side of the folded drape for sterile unfolding of said drape by opposed lateral spreading movement of the hands to said stop means to open said drape with its opening drooping away from the top edge portion extending between the spread hands.

7. A folded surgical drape as claimed in claim 6 wherein said one surface of said folded drape is adjacent said median line and at least one of said stop means is positioned on another surface of said folded drape than said one surface.

8. A folded surgical drape as claimed in claim 7 wherein both of said stop means are positioned on another surface of said folded drape than said one surface.

9. A folded surgical drape comprising

a four-sided trapezoidal panel having a top edge, a shorter bottom edge parallel thereto and two side edges

the transversely extending top edge of said panel being folded over upon and overlying said panel for the entire width thereof forming an overlapping cuff along the top of said panel

a first fold along the vertical median line of said panel halving said panel and bringing the two side edges and respective bottom edges substantially into edge-to-edge relationship with said overlapping cuff on the outside of said folded panel

panel sealing means sealing said side and bottom edges along the full length thereof providing a doubled panel with an open ended top with an outside cuff having an open bottom edge free from connection to said panel adjacent its bottom edge except along its top edge for a substantial distance on each side of said vertical median line

cuff attaching stop means adjacent the bottom edge of said cuff attaching said cuff to said panel, said stop means being positioned on opposite sides of said vertical median line at positions spaced from one another by a distance substantially less than half the length of the top edge of said panel

hand positioning indicia for the right and left hand respectively on said cuff between said stop means

at least two folds along lines parallel to and spaced from said vertical median line with said doubled panel folded over upon itself

at least two folds along lines parallel to and spaced below said overlapping cuff bottom edge

one surface of said folded drape having a folded edge defined by said median line and exposing a trans-

verse portion of said cuff including its top and bottom edges across the entire folded width thereof with said positioning indicia for the right and left hand, respectively, adjacent the left and right edges thereof with both of said stop means being positioned on another surface of said folded drape to provide a receiving pocket for the left and right hands in flat parallel side-by-side relationship on the same side of the folded drape for sterile unfolding of said drape by opposed lateral spreading movement of the hands to said stop means to open said drape with its opening drooping away from the top edge portion extending between the spread hands.

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