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Krzewinski

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[45] **Feb. 12, 1974**

[54] **UNIVERSAL SURGICAL DRAPE**

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[73] Assignee: **Johnson & Johnson**, New Brunswick, N.J.

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

[51] **Int. Cl.** **A61f 13/00**, A61b 19/06

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

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Primary Examiner—Richard A. Gaudet
Assistant Examiner—G. F. Dunne
Attorney, Agent, or Firm—Michael Q. Tatlow et al.

[57] **ABSTRACT**

There is disclosed a multipurpose surgical drape that has utility in different types of surgical procedures. The drape is composed of a nonwoven fabric and has on its upper surface adjacent one edge a reinforced panel having an absorbent surface and an impervious film between the absorbent surface and the main body of the drape. The drape is folded in such a manner that that portion of the drape having the reinforced panel may be cut to form functional drapes for different surgical procedures.

7 Claims, 15 Drawing Figures

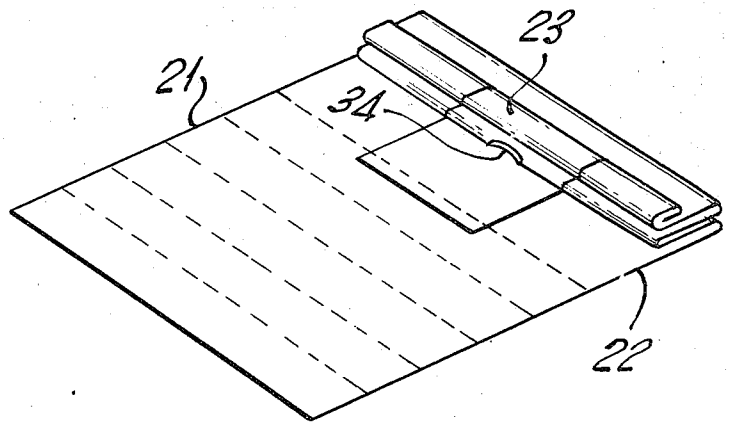


Fig. 1.

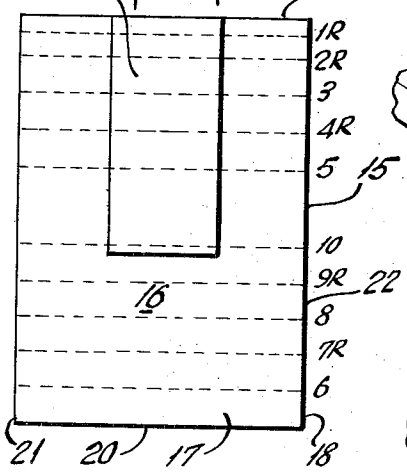


Fig. 2.

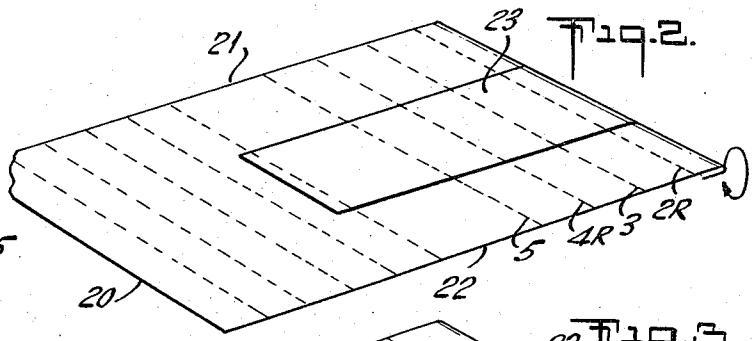


Fig. 3.

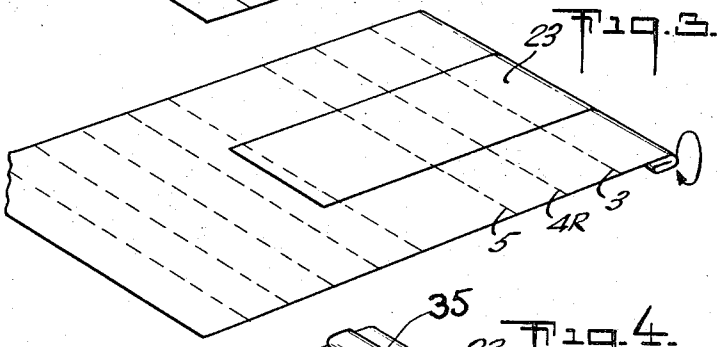


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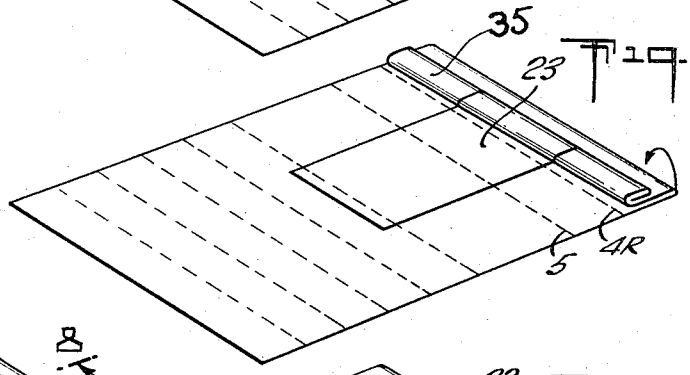


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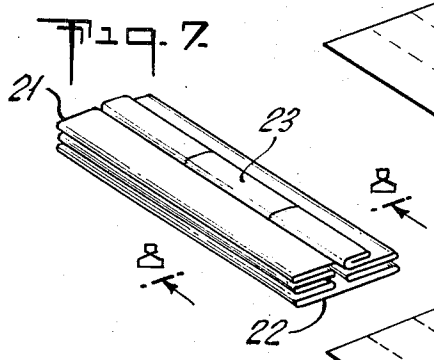


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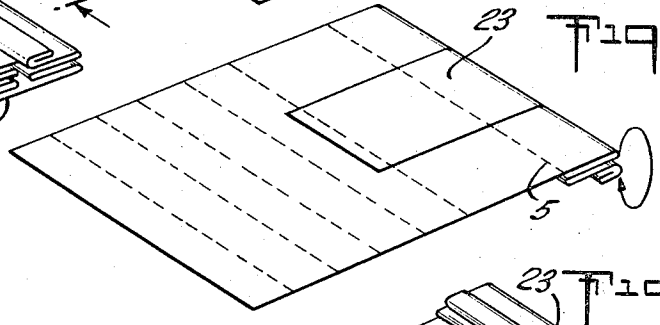


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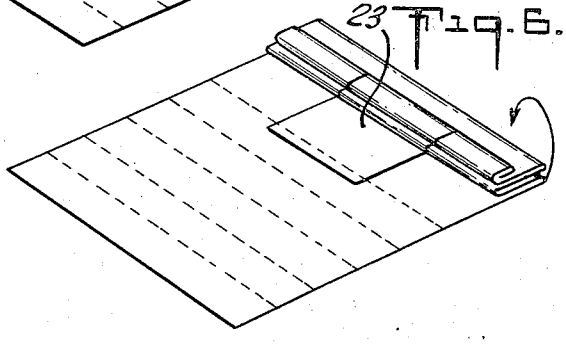


Fig. 8.

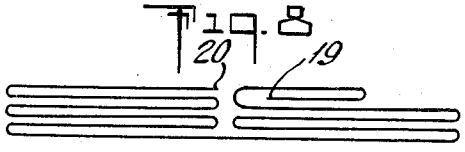


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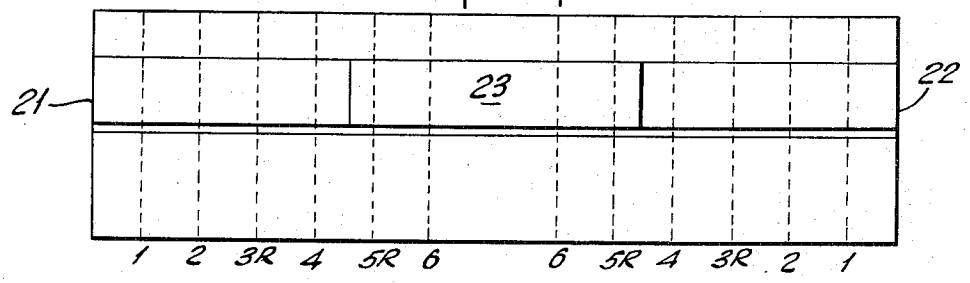


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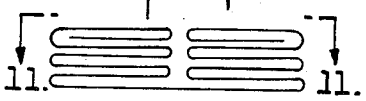


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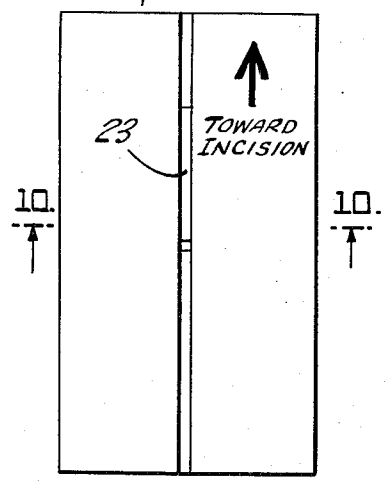


Fig. 12.

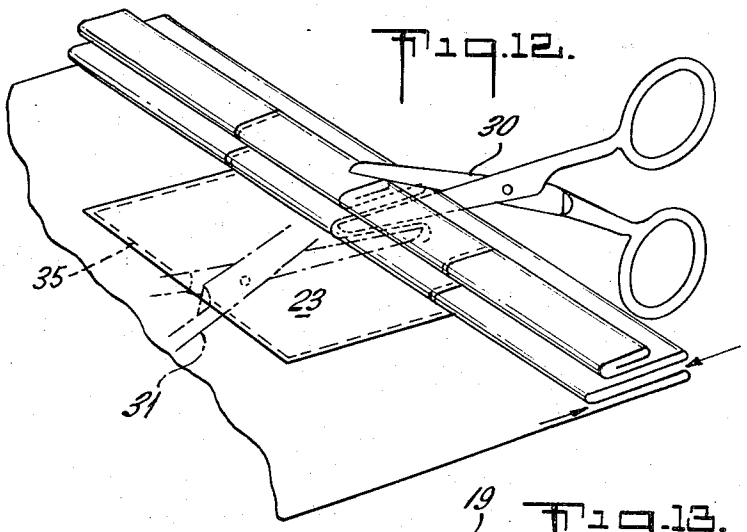


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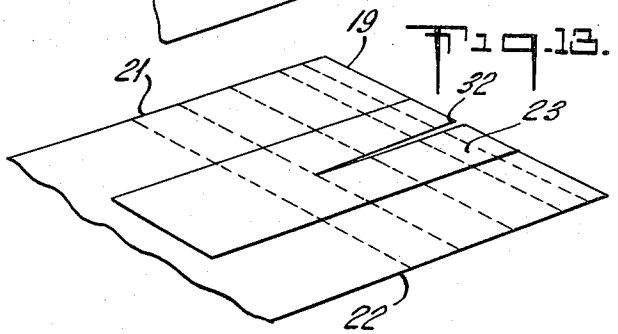


Fig. 14.

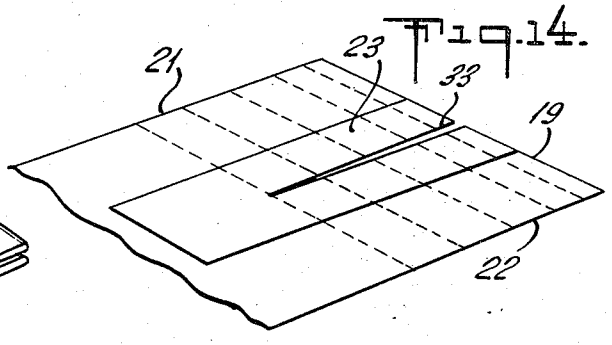
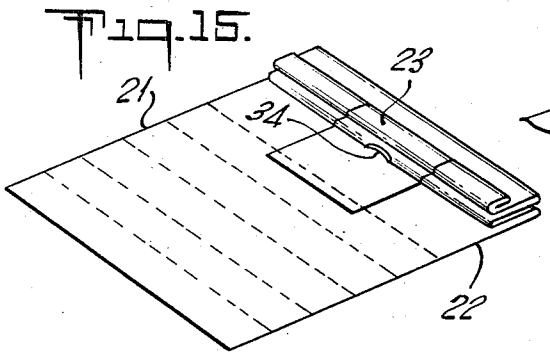


Fig. 15.



UNIVERSAL SURGICAL DRAPE

BACKGROUND OF THE INVENTION

It is normal surgical and obstetrical procedure to drape a patient prior to surgery. The purpose of the draping procedure is to prevent the surgically prepared areas of the skin of the patient from being contaminated by bactera. The surgical drape also protects the gowns worn by the surgeons and operating room nurses from being contaminated by unprepared areas of the patient. Operating room drapes made from linen or muslin have been in use for many years. In recent years improved operating room drapes made from nonwoven fabrics have been employed in operating rooms. These nonwoven drapes offer an additional advantage over the linen or muslin drapes in that they are usually water repellent. The water repellency of the nonwoven drapes prevents liquid strike-through of the drape and thereby preventing the possible migration of bacteria through the drape from the patient to the operating room staff or from the operating room staff to the patient. The particular construction of both linen and nonwoven drapes varies depending on the particular surgical procedure in which the drape is used. For example, in a laporatomy procedure, the entire body of the patient is covered by a single drape which has an opening or fenestration through the drape which is placed over the abdomen of the patient. The operation is performed through the fenestration leaving the remainder of the patient's body covered by the drape.

Most other major surgical procedures employ drapes which have been specifically constructed to provide the surgeon access to the particular portion of the patient's body which must be accessible to the surgeon to perform the surgery. There are a relatively large number of such major surgical procedures, and there have been surgical drapes developed for most of those procedures. In addition, there is also a need to modify surgical drapes to the desires of particular surgeons or to the requirements of a unusual surgical procedure. However, there are also a large number of minor surgical procedures that are performed, and it is not economically feasible for a surgical drape to be specifically constructed for each of these procedures. It is, therefore, desirable to develop a surgical drape which may be modified in the operating room to be used in a number of minor surgical procedures.

One of the reasons that has made it difficult to develop such a multipurpose drape is the stringent requirements of sterility in the operating room. Surgical drapes are delivered to the operating room within a sterile package and are maintained within the package until ready for use. It would not be desirable to extensively physically handle a surgical drape in order to modify it for a particular surgical procedure. Such physical handling of the drape in modifying it could possibly lead to contamination of the drape prior to its employment on the patient. For example, if a surgical drape must be substantially unfolded in order to modify the drape, there is an increased possibility that the drape would become contaminated before use. Prior attempts to provide a multipurpose surgical drape have resulted in products that were not particularly suitable for any of the many surgical procedures to which they were intended to be used. Applicant has now developed a unique surgical drape that may be used in many

different surgical procedures. This drape may be easily modified in the operating room to fully suit the particular requirements of many different procedures. In addition, the drape may be easily modified without excessive physical handling of the drape.

SUMMARY OF THE INVENTION

The invention is directed to a disposable drape to be employed in surgical or obstetrical procedures. The drape is constructed and folded so that thee is provided a disposable drape that can be utilized in a wide variety of surgical procedures. The drape can be easily modified to be suited for a particular surgical procedure without fully opening the drape from its folded configuration. This arrangement of the drape allows the drape to be modified without comprising sterile procedures or techniques.

The drape of the present invention is composed of a main panel and a reinforcing panel located adjacent one edge of the main panel. The drape is then folded so that the main reinforcing panel is easily accessible to allow modification of the reinforcing panel portion of the drape.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood with reference to the following drawings in which:

FIG. 1 is a top plan view of the drape of the present invention showing the position of the reinforcing panel and showing the fold lines for the first folding sequence of the drape.

FIGS. 2 through 6 show the preferred folding sequence for the first end of the drape.

FIG. 7 is a perspective view of the drape completely folded in the longitudinal direction.

FIG. 8 is a cross sectional view of the folded drape taken along the lines 8—8 of FIG. 7.

FIG. 9 is a top plan view of the drape folded in the longitudinal direction and showing the fold lines for the transverse folds of the drape.

FIG. 10 is a cross sectional view of the folded drape taken along the lines 10—10 of FIG. 11.

FIG. 11 is a top plan view of the completely folded drape.

FIG. 12 is a perspective view showing the drape being cut by the operating room staff.

FIG. 13 is a partial perspective view showing the opened drape with the slit obtained by cutting the drape in the manner illustrated in FIG. 12.

FIG. 14 is a partial perspective view showing the opened drape with a slit longer than that shown in FIG. 13.

FIG. 15 shows a partially opened drape with an edge view of a fenestration obtained by cutting the drape.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 1, the drape 15 comprises a main portion 16 having an upper surface 17 and a lower surface 18. The main portion of the drape is constructed of a relatively inexpensive nonwoven fabric. Suitable nonwoven fabrics are scrim reinforced tissue fabrics or wet laid nonwovens containing long fibers. The particular choice of a suitable nonwoven fabric is within the knowledge of one skilled in the art. The main portion of the drape has a first end 19 and a second end 20 and two opposing side edges 21 and 22. Affixed to the main drape in proximity to the first end is a reinforcing panel 23. The

edge of the reinforcing panel preferably does not extend to the very edge of the main panel but is spaced about one-eighth to one-quarter inch from the edge. The reinforcing panel can be addixed to the main portion of the drape by a suitable adhesive. The adhesive may be applied in and around the edge of the reinforcing panel or in a pattern over the entire panel or in a continuous overall coating. The center section of the reinforcing panel should be secured to the main body of the drape by a continuous overall coating of adhesive to prevent delamination of the reinforcing panel from the drape when the drape is cut as will be subsequently described. The reinforcing panel is preferably constructed with an upper absorbent surface and an impervious plastic film between the absorbent surface and the main portion of the drape. The absorbent surface of the reinforcing panel provides absorbency at the operation site to absorb body fluids and other fluids employed during surgery. The impervious plastic film in the reinforcing panel, shown as dotted line **35** in FIG. **12,** prevents the fluids from striking through the drape to the patient.

The following sequence of the first end portion of the drape containing the reinforcing panel is shown schematically in FIGS. 2 through 6. In the following description of the folding sequence and as used hereinafter in this application, a "reverse fold" is a fold in which the upper surface of the drape is turned toward the bottom surface of the drape around a fold line, and a "forward fold" is a fold in which the upper surface is turned toward the upper surface of the drape around a fold line. The first fold in the drape may be either a forward or a reverse fold. If the first fold is a forward fold, the fold must be shorter than the remaining folds in the drape. If both the first and second folds are reverse folds, then both the first and second folds must be shorter than the remaining folds in the drape. The short folds in the beginning of the folding sequence provide an easily identifiable cutting surface in the completed drape.

In order to facilitate the maximum utilization of the drape for the purposes which will be subsequently detailed, the second fold must be a reverse fold, and the third fold must be a forward fold. There should be at least three folds in the first end of the drape. There can be any number of folds in the first end of the drape and the subsequent folds will be alternately reverse and forward folds, but the last fold in the sequence should be a forward fold.

The preferred folding sequence is shown in FIGS. 2 through 6. In FIG. 2, the first end 19 of the drape is first reverse folded around fold line 1R. The drape is then reverse folded around fold line 2R as shown in FIG. 3. The drape is then forward folded around fold line 3 as shown in FIG. 4. The third fold is larger than the first and second folds. The smaller first and second folds will present an identifiable band in the drape when the drape is completely folded. The band is more prominent when the reinforcing panel is a different color or shade from that of the bottom surface of the drape. The fourth fold of the drape is a reverse fold, and the fifth fold is a forward fold. It should be noted that the fifth fold brings the band 35 to the upper surface of the drape. A drape may be constructed of such a size so that more than five folds in the first folding sequence would be desirable. The drape may have more than five folds so long as the last fold is a forward fold to bring the band 35 to the upper surface of the drape.

The second end of the drape may be folded in any manner. It is, however, preferred that the second end of the drape be fan folded to provide the optimum technique in maintaining sterility. Fan folding as used herein is a technique in which the drape is reverse folded and forward folded in a continuous sequence until the drape is completely folded. The second end **20** of the drape is folded to meet but not overlap the folded first end **19** of the drape. The folding sequence is diagrammed in FIG. **1.** The second end **20** is forward folded around fold line **6**; reverse folded around fold line 7R, and then alternately forward folded then reverse folded until the folding sequence is completed. Although only five folds are shown in FIG. **1,** it should be understood that if required by its dimensions, the second end of the drape could have any number of folds.

FIG. 7 shows a perspective view of the drape in which the longitudinal folds have been completed and are arranged in stacks. The folding sequence described above results in the band portion **35** of the reinforcing panel **23** lying at the upper surface of the drape after the drape has been folded in the longitudinal direction.

After the drape has been folded in the longitudinal direction, the side edges of the drape are folded in toward the center to form the drape into a compact configuration. The preferred folding of the side ends of the drape is a modified fan fold which is diagrammed in FIG. **9.** The drape is folded along lines **1** through **6.** It is forward folded on fold lines **1, 2, 4** and **6** and reverse folded along lines 3R and 5R from both side edges **21** and **22** toward the center of the drape. The first two forward folds at each end of the drape provide a pocket which can be easily grasped by the surgical staff to insure the proper aseptic technique in draping the surgical patient.

The completely folded drape is shown in cross section in FIG. **10** and in a plan view in FIG. **11.**

In the drape illustrated in the drawings, the reinforcing panel is at a longitudinal end of the drape, that is, at the end of the greatest dimension of the drape. It should be recognized that the reinforcing panel could be placed at a transverse or side edge of the drape, that is, at the edge of the shortest dimension of the drape. However, the maximum utility of the drape is obtained as the reinforcing panel is placed at a longitudinal end of the drape. The drape may be made in a number of different dimensions. It has been found, however, that a drape having a longitudinal dimension of slightly 6 feet and a transverse dimension of approximately 5 feet may be employed for most procedures.

As previously stated, the particular construction of the drape of the present invention allows the drape to be modified to be used in a great number of specific surgical procedures. For example, in surgery on a limb, it is desirable that the limb of the patient be the only part of the patient that is exposed to the surgeon. The drape of the present invention can be converted into a split sheet to drape a limb in the following manner: The drape would be removed from its sterile package and placed on the back table in the operating room. The drape would be partially opened by grasping the folded side edges **21** and **22** and lifting them out from the center of the folded drape. This unfolding will expose the folded reinforcing panel **23** of the drape. A member of

the surgical staff can then cut through the folded drape, as shown in FIG. 12, either from the center toward the edge or from the edge toward the center to provide a split sheet with varying lengths of the split. If the cut is made from the center of the drape toward the edge, five folds of the sheet will be cut, as is shown in FIG. 12 with the cut being made by scissors 30. The cut 33 made through the five folds is shown in FIG. 14.

If the cut is made from the outer edge of the drape toward the center, four folds will be cut and a sheet having a different length of slit will be obtained. The cut 32 made through the four folds is shown in FIG. 13. The overall adhesive coating in the center of the reinforcing panel prevents the separation of the reinforcing panel from the main sheet of the drape when the drape is cut. About 6 to 8 inches of the central section of the reinforcing panel and extending from the edge 19 of the drape to about the fifth fold line is overall coated with adhesive.

The cutting of the drape will be performed by a sterile nurse or surgeon using sterile scissors or other sterile cutting implements to maintain the sterile condition of the drape. The cut drape may then be placed on the patient with a minimum of handling and remain in a sterile condition. The split sheet has utility in orthopedic surgery on limbs and also as a head sheet for a neurosurgical procedure, a myringectomy, a tonsillectomy or other procedure involving the head of the patient.

The drape may also be used for many other surgical procedures by modifying the shape of the cut in the reinforcing panel of the drape. For example, the drape may be partially opened and an arcuate cut 34, as shown in FIG. 15, made in a fold of the drape. An arcuate cut will provide a circular fenestration in the unfolded drape which could be used for draping the patient undergoing a spinal tap, a minor cyst removal or a similar procedure in which the fenestration should be of small diameter. The particular location of the circular fenestration in the open drape may be varied by making the arcuate cut in different folds of the drape.

The construction of the present drape with the reinforcing panel at one edge combined with the folding arrangement disclosed results in a surgical drape capable of being used in many different surgical procedures. The reinforcing panel 23 provides an absorbent surface and a reinforced area which may be positioned at or near the operation site. The folding arrangement of the drape presents access of the reinforcing panel to the surgical staff so that the drape may be easily modified to fit a particular surgical procedure without excessive handling of the drape.

I claim:

1. A multipurpose, disposable surgical drape comprising a main sheet having a top surface, a bottom surface, a first and a second end edge and two opposing side edges, and having a reinforcing panel smaller in size than the main sheet affixed to the top surface of said main sheet in proximity to said first end edge and between said opposing side edges and spaced therefrom, said drape being first folded inwardly from the end edges toward the center of the sheet, said first end edge being folded at least three times to the center of the main sheet to form a first stack of at least three folds, the first and second folds being smaller than the remaining folds, said second fold being a reverse fold, said third fold being a forward fold, said second end edge being folded at least three times to the center of the sheet to form a second stack of folds terminating in juxtaposition to said first stack of folds, and both of said side edges being folded toward the center of the sheet to form a compactly folded drape which is capable of modification without excessive handling.

2. The surgical drape of claim 1 in which there is an impervious plastic sheet underlying the reinforcing sheet.

3. The surgical drape of claim 2 in which there is a continuous coating of glue adhering the central section of the reinforcing panel to the main sheet of the drape.

4. The surgical drape of claim 1 in which the distance between the first and second edges of the sheet is greater than the distance between the side edges of the sheet.

5. The surgical drape of claim 1 in which said first end has five folds, including a fourth reverse fold and a fifth forward fold.

6. The surgical drape of claim 1 in which the reinforcing panel has an absorbent surface.

7. A multipurpose, disposable surgical drape comprising a main sheet having a top surface, a bottom surface, a first end edge, a second end edge and two opposing side edges, a reinforcing panel smaller in size than the main sheet adhesively secured to the top surface of said main sheet adjacent the first end edge and equidistant from said opposing side edges, said reinforcing panel having an absorbent upper surface and an impervious plastic film between said absorbent surface and said main sheet, said first end edge being folded inwardly toward the center of the main sheet in at least five folds, the first and second folds being reverse folds and being smaller than the remaining folds, the third fold being a forward fold, the fourth fold being a reverse fold, and the fifth fold being a forward fold, said second end being fan folded toward the center of said main sheet, each of said side edges being fan folded toward the center of said main sheet to form a compactly folded drape.

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