

[54] **SURGICAL DRAPE SHEET**

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[52] U.S. Cl. **128/132**
[51] Int. Cl. **A61I 15/00**
[58] Field of Search **128/132, 171**

[56] **References Cited**

UNITED STATES PATENTS

3,561,440 2/1971 Bayer **128/132 D**
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FOREIGN PATENTS OR APPLICATIONS

148,164 12/1954 Sweden **128/132 D**

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[57] **ABSTRACT**

A disposable surgical drape sheet, of the type having a porous nonwoven fabric sheet for placing over a surgical patient and having a fenestration near its center to expose an operative area, is provided with a continuous film of pressure-sensitive adhesive surrounding the fenestration near its center to expose an operative area. It has a continuous film of pressure-sensitive adhesive surrounding the fenestration and extending a substantial distance from the periphery. A removable adherent peel strip covering the adhesive area is removed before using the sheet, thereby exposing the adhesive and permitting the sheet to be secured around the operative area. Additionally, the adhesive fluid-proofs one side of the drape.

4 Claims, 7 Drawing Figures

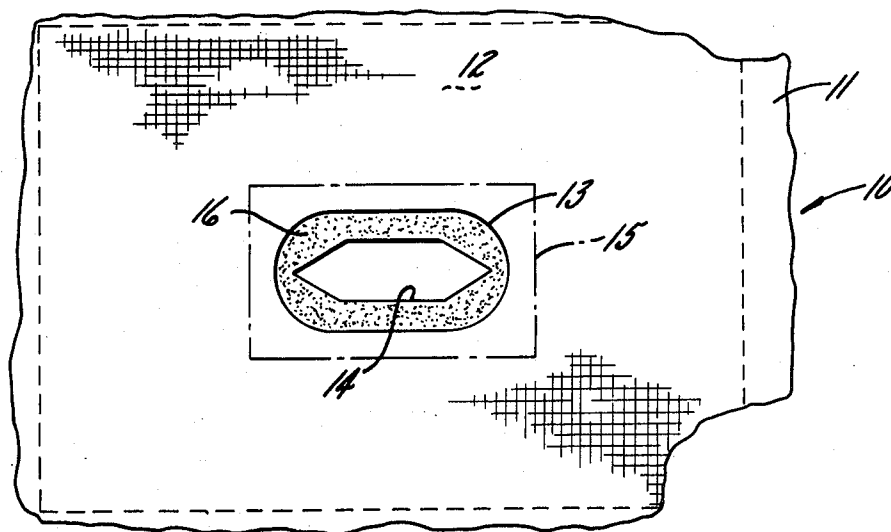


FIG. 10

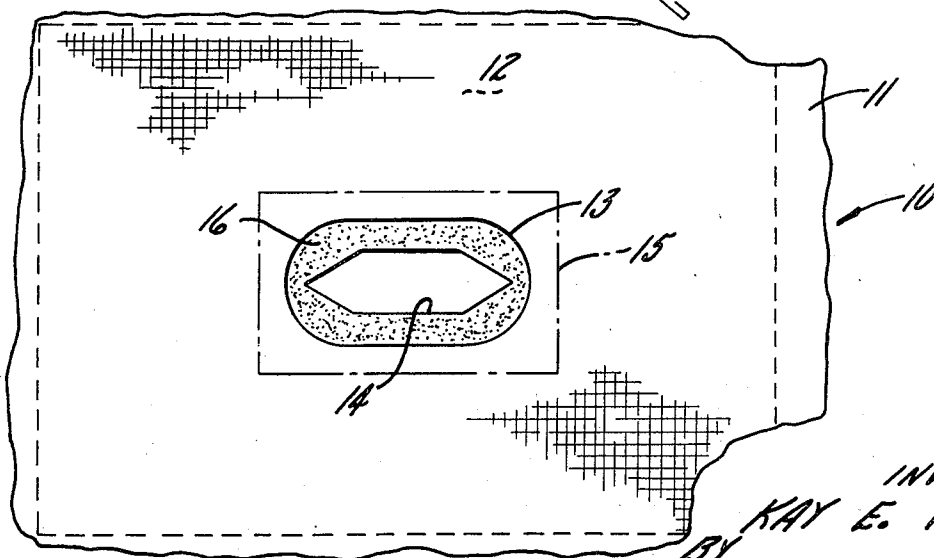
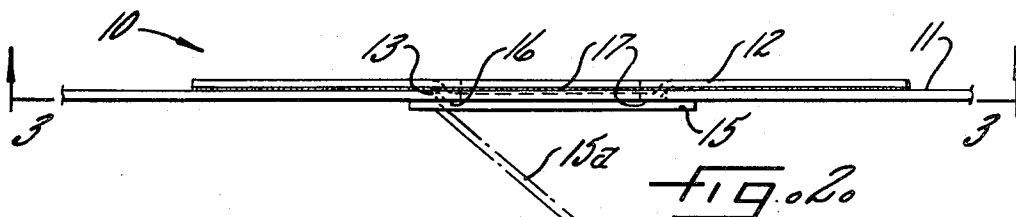
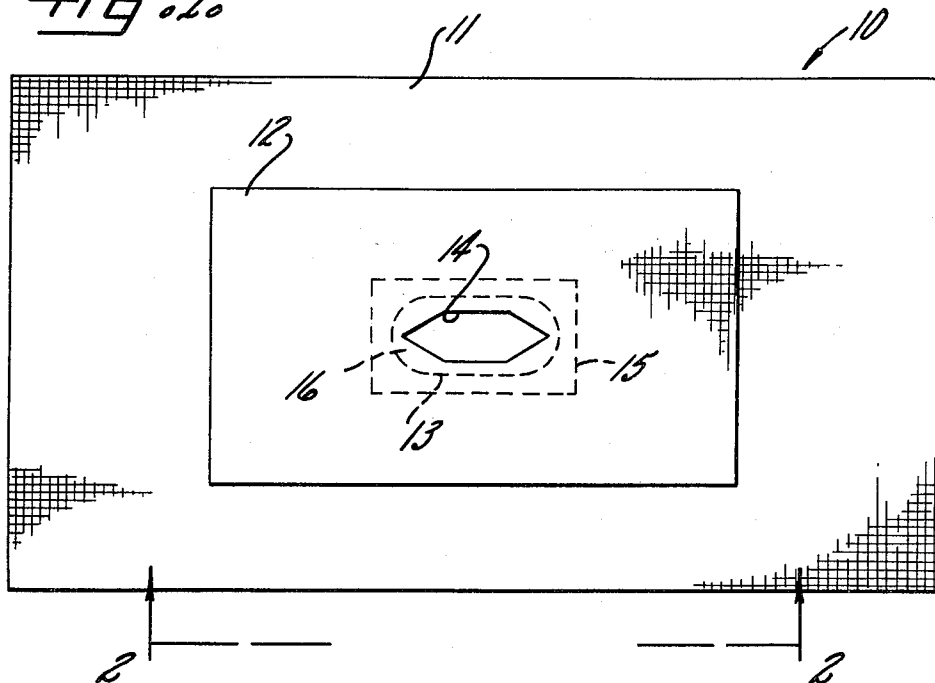


FIG. 30

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Fig. 4.

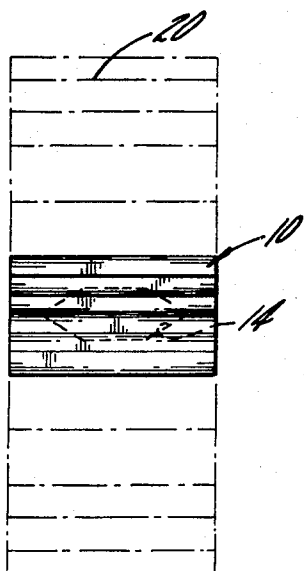
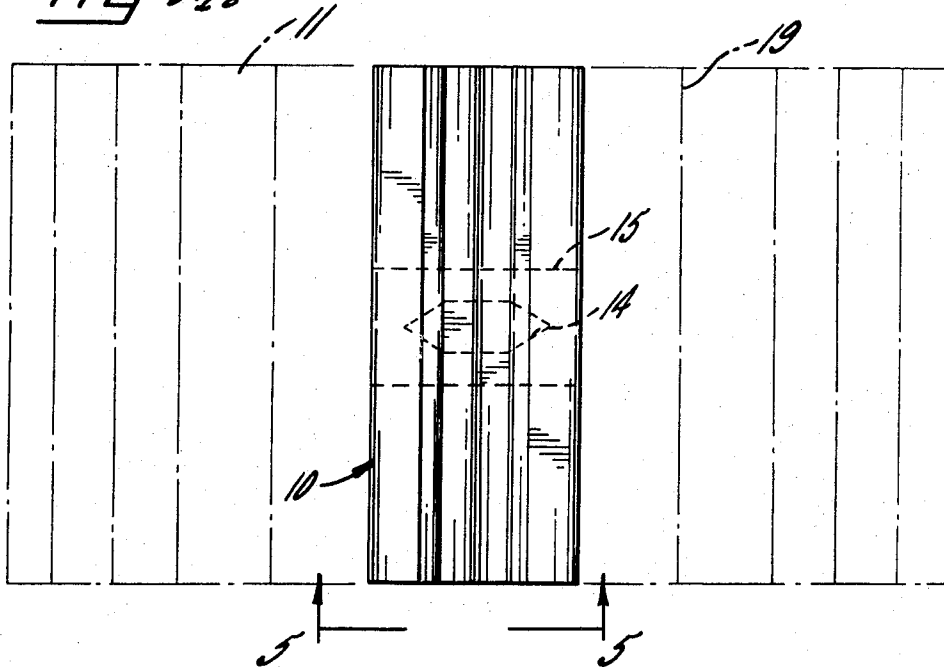


Fig. 6.

Fig. 5.

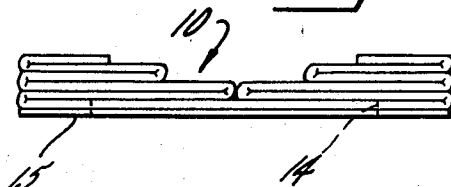
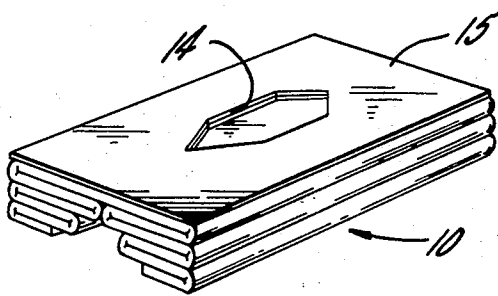


Fig. 7.



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SURGICAL DRAPE SHEET

This invention relates to surgical drape sheets, and more particularly concerns the provision of a novel disposable drape made of porous nonwoven fabric.

Customarily, a patient who is to undergo surgery or the like is partly covered with a drape sheet having a generally central fenestration which exposes only the operative area. The previous use of cloth drapes for this purpose, with their attendant initial and laundry costs and their difficulty in sterilization, has now largely given way to the use of disposable drapes.

At present, disposable drapes are of two general types, namely those of a paper-like nonwoven fabric and those made of a plastic material. While both are used, they each have well recognized limitations. Nonwoven fabric sheets, for example, are not fluid proof, thereby permitting the patient's perspiration to enter the operative field and allowing blood and other body fluids to be discharged onto undesirable areas. Also, nonwoven disposables tend to be somewhat more slippery than textile fabrics, and the use of skin clips or the like to secure the drape is inconvenient for the surgical team and perhaps painful for the patient. On the other hand, plastic sheets are inherently fluid proof, but most tend to be even more slippery, as well as to produce undesirable glare under the intense operating room illumination. Additionally, there is some concern, whether or not justified, about the tendency of plastic drapes to produce static electricity.

It has been proposed to overcome the disadvantages of plastic surgical drapes by utilizing adhesives to secure the drape in position. However, adhesive brushed or sprayed onto the patient is inconvenient at best, while adhesives applied to the drape during manufacture require a removable peel strip to protect the adhesive until use. Since, in any event, the surgical drape must be sterilized in advance, an impervious plastic drape on one side of the adhesive and an equally impervious peel strip on the other effectively prevents the sterilizing medium from reaching the adhesive.

It is accordingly an object of the present invention to provide a disposable surgical drape which integrates the advantages of nonwoven fabric drapes with regard to absence of glare, slipping, and sparking and ease of sterilization, with the fluid-proof feature of plastic disposables.

Another object is to provide a disposable surgical drape made of nonwoven fabric that is securable to the patient without the need for skin clips or the like.

Still a further object is to provide a unique convenient disposable surgical drape which may be supplied to the operating room in a completely sterile condition.

Other and further aims, objects, and advantages of the invention will become apparent as the description proceeds, which description is in conjunction with the attached drawings wherein:

FIG. 1 is a plan view, looking downward, of a representative surgical drape according to the invention;

FIG. 2 is an enlarged sectional view, taken along line 2—2 of FIG. 1, showing the fenestration area, and in which the thickness of the several drape components is greatly exaggerated for reasons of clarity;

FIG. 3 is a somewhat enlarged fragmentary bottom view of the drape of FIG. 1, in the condition in which it is applied to the patient;

FIG. 4 shows a partly folded pack or package of the drape, indicating in phantom the unfolded drape and the fold lines;

FIG. 5 is an end view of the partly folded drape pack depicted in FIG. 4;

FIG. 6 depicts the completely folded drape of FIG. 4, again showing in phantom the original fold lines; and

FIG. 7 is a perspective of the folded drape pack as it is removed from a container (not shown) and made available to the surgical nurse.

While the invention will be described in connection with certain preferred embodiments, it will be understood that it is not intended to limit the invention to these particular embodiments. On the contrary, it is intended to cover all alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention.

Turning now to the drawings, and in particular to FIG. 1, an illustrative disposable surgical drape sheet 10 is depicted in a plan or top view looking in a downward direction. The sheet 10 essentially includes a first sheet or sheet member 11 which covers a substantial portion of the patient, and a fenestration or aperture 14 located generally in the central region of the sheet. Although surgical drape sheets within the compass of the invention may have different sizes depending on whether the sheet is for laparotomy, abdominal, cystoscopy, or pediatric use, an illustrative laparotomy drape is 118 inches long by 90 inches wide. The fenestration 14 in this drape is approximately 12 inches long by 4 inches wide, and is located 44 inches from the head end of the sheet and 62 inches from the foot end.

In keeping with the invention, the disposable drape 10 is made of a porous nonwoven fabric. The preparation of such fabrics form no part of the present invention, and essentially these materials are adhesively bonded paper-like mats of natural or synthetic textile fibers. The manufacture of porous nonwoven fabrics is described, for example, in Buresh, "Nonwoven Fabrics" (Reinhold, 1962) and in Krcma, "Nonwoven Textiles" (SNTL, Prague, 1962).

As shown in FIGS. 1 and 2, the first sheet 11 is advantageously provided with a second sheet 12. The surgical fenestration 14 is actually defined by an aperture in the second sheet 12, while a substantially larger aperture 13 is in the first sheet 11. Illustratively, the aperture 13 is 1 inch away from the aperture 14, for reasons which will appear. It may be noted at this stage, however, that the area 16 defined by the overlap of the apertures 13 and 14 contains a pressure-sensitive adhesive 17.

The second or smaller nonwoven fabric sheet 12 is coated on its underside (FIG. 2) with a normally tacky and pressure sensitive adhesive. Thus, when the second sheet 12 is placed atop the first sheet 11 so that the respective apertures 14, 13 are in substantial register, pressure applied to the second sheet secures the respective sheets together and also provides the adhesive coated area 16.

Normally tacky and pressure-sensitive adhesives for use herewith may be any of the biologically acceptable pressure-sensitive adhesives available. Adhesives of this class are generally composed of a film-forming elastomeric material, typically a natural or synthetic rubber, and some type of resin or other material to impart the desired degree of tack, wetting power, and specific adhesion. Typical resins include the rosin derivatives such as hydrogenated or dehydrogenated rosin or their esters. Various fillers, plasticizers, sterilizing agents, or other modifiers may also be used. For further descriptions of such adhesives, see Kirk-Othmer, "Encyclopedia of Chemical Technology", Second Edition, Vol. I, page 382 (Interscience 1963).

To protect the adhesive-containing area extending from the periphery of the fenestration 14 to the aperture 13, an adherent peel strip 15 is employed to cover at least the adhesive area 16 (FIG. 2). The peel strip 15 is illustratively a plastic, heavy paper, or nonwoven fabric having an adherent coating, that is, a coating to which the adhesive 17 can be secured only lightly. Abherents suitable for this purpose include natural or synthetic waxes, metal salts of fatty acids, polymeric abherents such as polyethylene or silicone polymers, etc. Abherents are discussed in Kirk-Othmer's "Encyclopedia", Second Edition, Vol. 1, page 1 et seq.

Turning now to FIG. 3, a patient's eye view of the underside of the sheet 10 is shown. The smaller or second sheet 12 is on the upper side of the first sheet 11, and the initial position of the peel strip 15 (FIG. 2) is indicated in phantom at 15. Between the fenestration 14 of the second sheet 12 and the aperture of the first sheet 11 is, of course, a continuous film of adhesive 17 (FIG. 2) over the area 16. This adhesive-coated area serves two functions: Not only does it present a sterile adhesive useful for securing the surgical drape 10 in position on the patient, but it also renders the underside of the drape 10 fluid-proof in the region of the operative area.

Further, the adhesive 17 (FIG. 2) existing between the first and second sheets 11, 12 forms a fluid-proof barrier surrounded on either side by a porous nonwoven fabric. Thus, neither perspiration nor blood or other body fluids can pass through the drape anywhere in the region of the second sheet 12, while, by reason of the porous absorbent nature of the nonwoven fabric, any fluids are protectively absorbed by the material.

When all the above advantages are not required, the surgical drape 10 of the invention may omit the second sheet 12. In this event, it is necessary only to coat an area 16 on the first sheet 11 with an adhesive and to protect this area with a peel strip 15 (FIG. 2).

As indicated in FIGS. 1 through 3, an aperture may be provided in the peel strip 15 which matches, or substantially matches, the fenestration 14 in the sheet 10. Alternatively, and in many instances desirably, the peel strip 15 may have no such aperture.

Turning now to FIGS. 4 through 6, a system is shown for folding the surgical drape 10 into a convenient pack with the peel strip 15 on the top of the pack for easy removal in use. As indicated in FIG. 4, the initial first sheet 11 is folded along phantom fold lines illustrated by line 19 to establish a partly folded pack the width of the initial sheet. This is further folded, as indicated generally in FIG. 6, along phantom fold lines typified by line 20, to form the ultimate pack depicted in FIG. 7. In this latter condition, the peel strip 15 is on top, and may be removed easily by the surgical nurse before the surgical drape is placed on the patient.

Thus it is apparent that there has been provided, according to the invention, an unusually simple and low cost surgical drape sheet that integrates the advantages of pre-existing drapes and yet which is actually superior in many respects to woven fabric drapes. The inventive disposable surgical drape thus fully satisfies the objectives set forth earlier.

I claim as my invention:

1. In a disposable surgical drape sheet of the type having a porous nonwoven fabric sheet for placing over a surgical patient and having a generally central fenestration to expose the

operative area, said drape sheet comprising:

a first nonwoven sheet member having a generally central aperture substantially larger than said fenestration;

a second, smaller, nonwoven fabric sheet member having an aperture defining said fenestration, said second sheet member having a substantially continuous film of normally tacky and pressure sensitive adhesive on one side thereof to secure said first and second sheets together with the respective apertures in substantial register to thereby provide said substantially continuous film of adhesive surrounding said fenestration; and

a removable adherent peel strip covering at least said continuous film of adhesive surrounding said fenestration; so that after removal of said peel strip and placement of said drape over a patient, the fenestration is adhesively securable around the operative area to prevent slipping, said film of adhesive fluid proofing one side of said drape in the region of said operative area.

2. Sheet of claim 1 folded into a pack so that said peel strip is on the outside of said pack.

3. Sheet of claim 1 wherein said porous nonwoven fabric sheet consists essentially of a single nonwoven sheet with said adhesive surrounding said fenestration therein.

4. In a disposable surgical drape sheet of the type having a nonwoven fabric sheet for placing over a surgical patient and having a fenestration therein for exposing the operative area, said drape sheet comprising, in combination:

a first sheet member having an aperture substantially larger than said fenestration;

a second fabric sheet member having an aperture defining said fenestration, said first and second sheet members being adhesively bonded together;

said second sheet member having a substantially continuous film of pressure sensitive adhesive on one side thereof exposed through said aperture of said first sheet member and surrounding said fenestration and extending a substantial distance from the periphery thereof, said respective apertures being in substantial register.

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