

[54] DISPOSABLE DRAWSHEET

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[58] Field of Search 5/327, 334, 335

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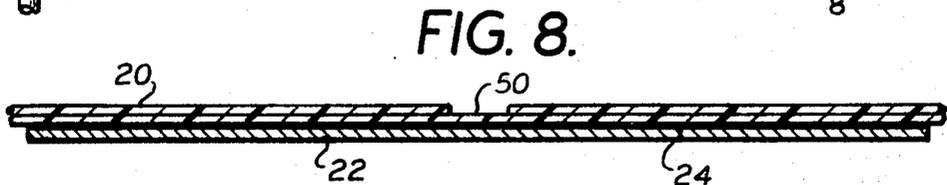
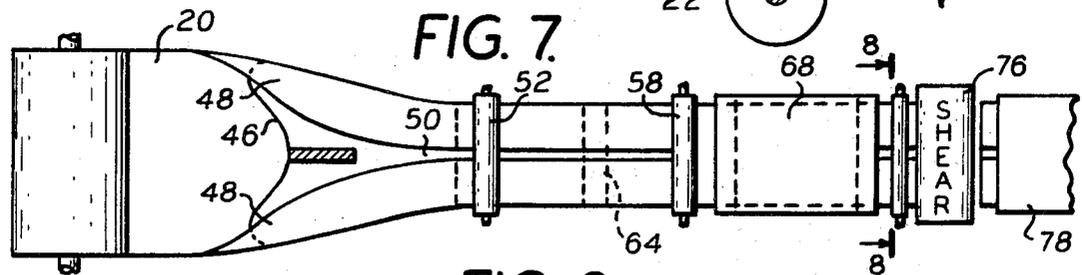
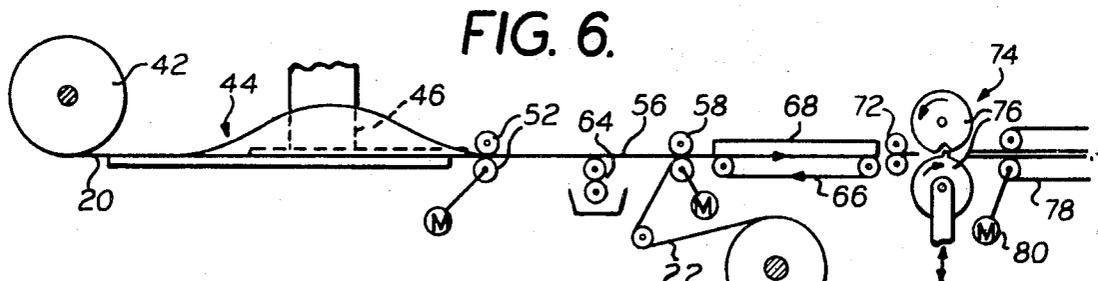
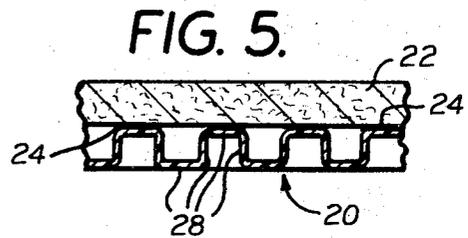
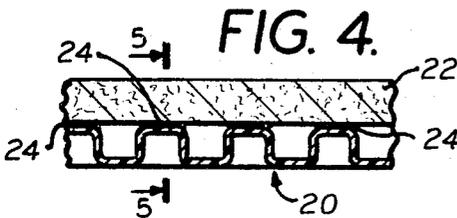
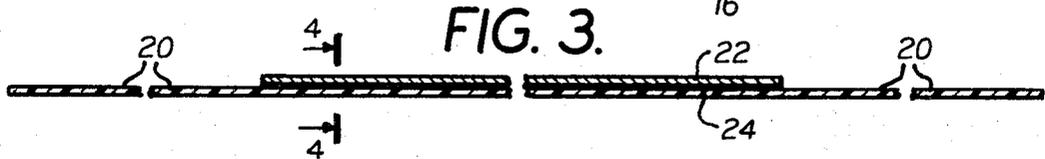
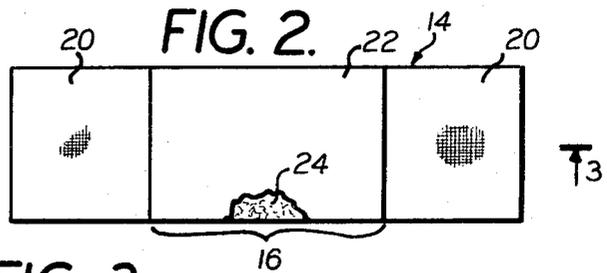
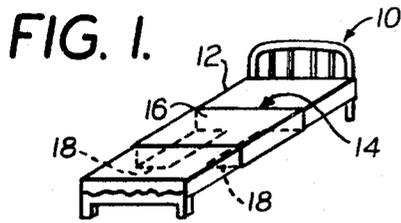
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[57] ABSTRACT

A drawsheet, suitable for hospital use, is made with a plastic film to which is laminated a highly absorbent nonwoven fabric over only the portion of the sheet that is on top of the mattress when in use. By using low-cost plastic and fabric, and by making the article by a continuous and low-cost method of manufacture, the drawsheet of this invention is suitable for use as a disposable item. Embossed polyethylene film is used and is bonded to a nonwoven cellulose fabric by adhesive applied to the plastic web with the latter folded into a flattened tube so that the adhesive contacts with only one-half of the width of the tube.

7 Claims, 8 Drawing Figures





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DISPOSABLE DRAWSHEET

BACKGROUND AND SUMMARY OF THE INVENTION

In hospitals, drawsheets are used to protect the bedding on the mattress from soiling or wetting by the patient. Cloth drawsheets are used above the regular bedding and plastic or rubber sheets are normally placed under the regular sheet. In both cases the sheet is drawn across the bed and secured under the mattress on each side.

This invention provides a disposable drawsheet which is a laminated product with a plastic portion that extends across the top of the mattress and that tucks under the mattress on both sides, and which also provides an absorbent portion bonded to the top surface of the plastic over the midregion of the sheet which constitutes the part that covers the top of the mattress and that comes in contact with the patient.

The method of this invention takes a plastic web from a supply reel and folds the plastic back along both longitudinal edge regions to leave a midregion between the folds that is the approximate width of the top of the mattress for which the drawsheet is intended. The unfolded part of the plastic web is coated on its underside with adhesive and after the web has traveled far enough for the adhesive to become tacky, the absorbent portion, preferably a cellulose nonwoven fabric, is brought into contact with the plastic portion between the fold lines and is bonded to the plastic portion by adhesive of a consistency that does not fill up the interstices of the absorbent portion.

The traveling webs, attached to one another, are cut apart to form individual drawsheets that have a width extending transversely of the length of the webs. The length of the drawsheet is the distance between cuts and the plastic portion and the absorbent portion have the same length.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

BRIEF DESCRIPTION OF DRAWINGS

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views:

FIG. 1 is a diagrammatic, isometric view of a bed having a mattress and a drawsheet in position on the mattress;

FIG. 2 is a greatly enlarged top plan view of the draw sheet of this invention when in a flat condition and before being applied to a mattress;

FIG. 3 is a greatly enlarged, fragmentary, sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a greatly enlarged sectional view taken on the section line 4—4 of FIG. 3;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a diagrammatic side elevation illustrating the method by which the drawsheets of this invention are made;

FIG. 7 is a top plan view of the apparatus illustrating the method of FIG. 6; and

FIG. 8 is a greatly enlarged sectional view taken on the line 8—8 of FIG. 7.

DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 shows a bed 10 on which there is a mattress 12, having a drawsheet 14 across the top of the mattress and tucked in under the sides of the mattress in accordance with conventional practice. A midregion 16 of the drawsheet covers the top of the mattress and is the part of the drawsheet with which a patient in the bed comes in contact. Edge regions 18 of the drawsheet are shown in dotted lines tucked in between the mattress 12 and the springs of the bed.

FIG. 2 shows the drawsheet 14 in an unfolded condition. The drawsheet has a plastic portion 20 which extends for the full width of the drawsheet and there is an absorbent portion 22 covering the midregion 16 of the plastic portion 20.

The absorbent portion 22 is secured to the plastic portion 20 by adhesive 24. In FIG. 2 the absorbent portion 22 is broken away at its lower right-hand corner to expose the adhe-

sive 24. In FIG. 3 the adhesive is indicated by the heavy line 24.

FIGS. 4 and 5 are sectional views on a much larger scale than the other views and show the contour of the plastic portion 20. It has an undulating top surface 28 which is made by giving the plastic an embossed waffle pattern. The adhesive 24 actually covers only the high parts of the top surface of the plastic portion 20. This has the advantage of leaving some space under the absorbent portion 22 and thus increases the amount of water that the drawsheet will retain. It also increases the flexibility of the drawsheet over the midregion where the absorbent portion 22 is secured or bonded to the plastic portion 20.

It will be understood that the invention can be made with a flat plastic film, if desired, and that a woven absorbent fabric can be used, but this increases the expense of the product without commensurate advantages.

The plastic portion 20 is preferably made of polyethylene and in the preferred construction the polyethylene is colored so that it is easy to separate the disposable items and the reusable sheets when stripping a bed. This eliminates danger that some of the white sheets of the bed may be thrown away with the disposable draw sheets. Polyethylene of a thickness of approximately 0.001 inch - 0.002 inch has been used effectively for this invention. Other equivalent plastic material can be used, such as polyvinyl chloride or polypropylene sheet.

The absorbent portion 22 is preferably a nonwoven cellulose fabric having a thickness of approximately $\frac{3}{4}$ to 1 $\frac{1}{2}$ oz. per sq. yd.

The adhesive 24 must be of a consistency, when the absorbent material 22 is brought in contact with it, that will not fill up some of the interstices of the absorbent material, thereby decreasing its water-absorbing capacity. In the preferred construction, the adhesive is a composition which becomes tacky shortly after being applied to the plastic 20, and which remains tacky and flexible permanently. Suitable adhesives include Chemtac No. P 777 Chemionics Inc. 20-21 Wagraw Rd., Fairlawn, N.J. Fuller No. S 3468 & 3017 H.B. Fuller Co., Brunswick Ave., Edison, N.J.

FIGS. 6-8 show the preferred method of this invention for making the drawsheet illustrated in the other figures. A web of the plastic material 20 comes from a supply reel 42 and moves progressively through a folding station 44 at which a folder 46 turns the edge region 48 over the midportion of the web to form a flattened tube. In the preferred method, the turned-over edge portions 48 have a combined width substantially equal to the unfolded midportion and this produces a flattened tube having a longitudinal seam 50. The seam 50 is shown open in FIGS. 7 and 8, but it can be a lap seam. The advantage of having the seam 50 slightly open is that it avoids an extra thickness of material along a localized portion of the width of the flattened tube, but such a condition is not critical. The tube can be made with a wide gap between the opposite edges of the web, but since the folded edge regions include the portions of the drawsheet which extend down the sides of the mattress, it is advantageous to have the edge regions wide enough to leave ample material for tucking in under the mattress to hold the drawsheet tight.

Driven feed rolls 52 constitute part of the apparatus at the folding station and these feed rolls 52 advance the flattened tube with continuous motion.

The flattened tube, designated by the reference character 56, passes through another feed roll stand 58 to which a web of the absorbent material 22 is supplied from a supply reel 60. The web of absorbent material 22 is brought in contact with the bottom surface of the flattened tube 56 at the feed roll stand 58 and adhesive is applied to this bottom surface by an applicator 64 located ahead of the feed roll stand 58.

The spacing of the applicator 64 from the feed roll stand 58 is correlated with the speed of travel of the flattened tube 56 and with the characteristics of the adhesive, which is dispensed by the applicator 64, so as to leave time for the adhesive to become tacky before it enters the feed roll stand 58.

The plastic material of the flattened tube 56 and the absorbent material 22 from the reel 60 are pressed together, with adhesive between them, in the feed roll stand 58; and they are held in contact with one another as they travel with the top run of an endless belt 66 which presses the webs against a top plate 68. Other feed rolls 72 advance the connected webs to a cutoff station 74 where the connected webs are cut at longitudinally spaced regions to produce individual drawsheets. FIG. 6 shows a flying shear 76 for severing the attached webs, but other cutoff means can be employed.

The severed drawsheets are taken from the cutoff station by a conveyor 78 which is shown diagrammatically as two endless belts located above and below the severed sheets and driven by a motor 80.

The preferred embodiments of the invention have been illustrated and described and the invention is defined in the appended claims.

What is claimed is:

1. A disposable drawsheet including a water-impervious, pliant, bottom portion made of a thin sheet of plastic material of a width that extends across the top of a mattress with which it is intended to be used and that tucks in for a substantial distance under opposite sides of the mattress, said plastic material being thin enough to be inexpensive and disposable, and thick enough to resist tearing when tucking in and holding the drawsheet tight on a bed, and a top layer made of an absorbent material located on top of the plastic portion across the midregion and only the midregion of the width of the plastic bottom portion for contact with a patient in the bed, the absorbent top layer being of substantially the same length as the plastic portion but terminating short of the ends of the drawsheet that tuck under the mattress, the absorbent top layer being inexpensive, relatively thin, nonwoven material and being bonded to the plastic bottom portion and held in place thereby.

2. The disposable drawsheet described in claim 1 characterized by an adhesive coating on the area of the plastic portion that is under the absorbent portion, and the absorbent portion being attached to the plastic portion by said adhesive.

3. The disposable drawsheet described in claim 2 characterized by the adhesive being permanently tacky for securing the absorbent portion of the drawsheet to the plastic, and the adhesive being of a consistency that is not absorbed by said absorbent portion.

4. The disposable drawsheet described in claim 1 characterized by an adhesive coating on the plastic covering substantially the entire area of the plastic that is in contact with the absorbent portion of the drawsheet.

5. The disposable drawsheet described in claim 1 characterized by the plastic portion having an undulating surface on at least the top side thereof, and adhesive on at least the high parts of the undulating surface securing the absorbent portion to the plastic portion.

6. The disposable drawsheet described in claim 5 characterized by the plastic portion being embossed with a waffle pattern over its entire area, the absorbent portion being a highly porous nonwoven fabric secured to the plastic portion entirely by adhesive, and said adhesive being permanently tacky and flexible and of a consistency that is not absorbed by said absorbent portion, the width of the absorbent portion being approximately one-half the width of the plastic portion and the length of both portions of the drawsheet in the direction of the length of the bed being substantially equal.

7. The disposable drawsheet described in claim 1 characterized by the water-impervious, pliant, plastic portion of the draw sheet having a thickness of approximately 0.001 inch-0.002 inch and the absorbent portion on top of the plastic portion having a thickness of approximately 3/4 to 1 1/2 oz. per sq. yd.

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