May 18, 1965 L. D. PATTERSON 3,183,910

SANITARY NAPKIN ROLL AND METHOD OF MAKING

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Fig. 1.

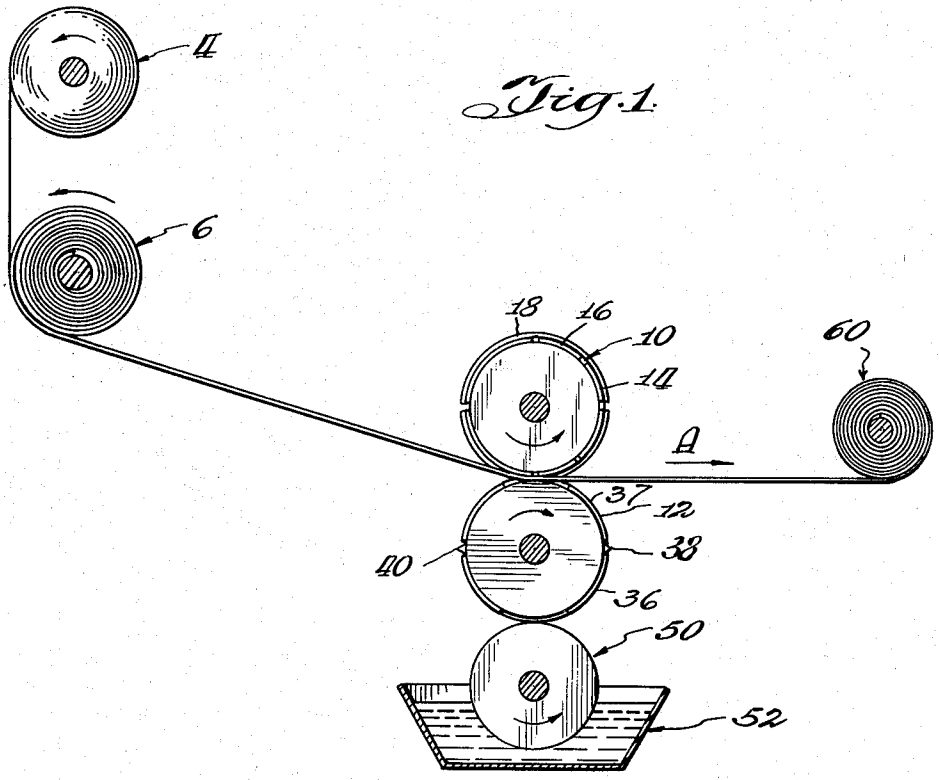


Fig. 5

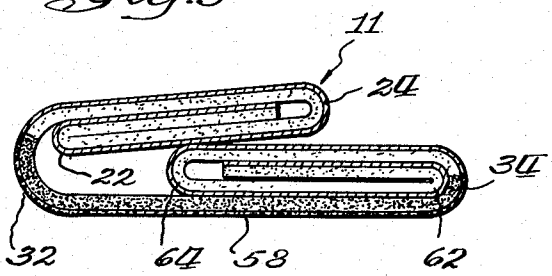


Fig. 4.

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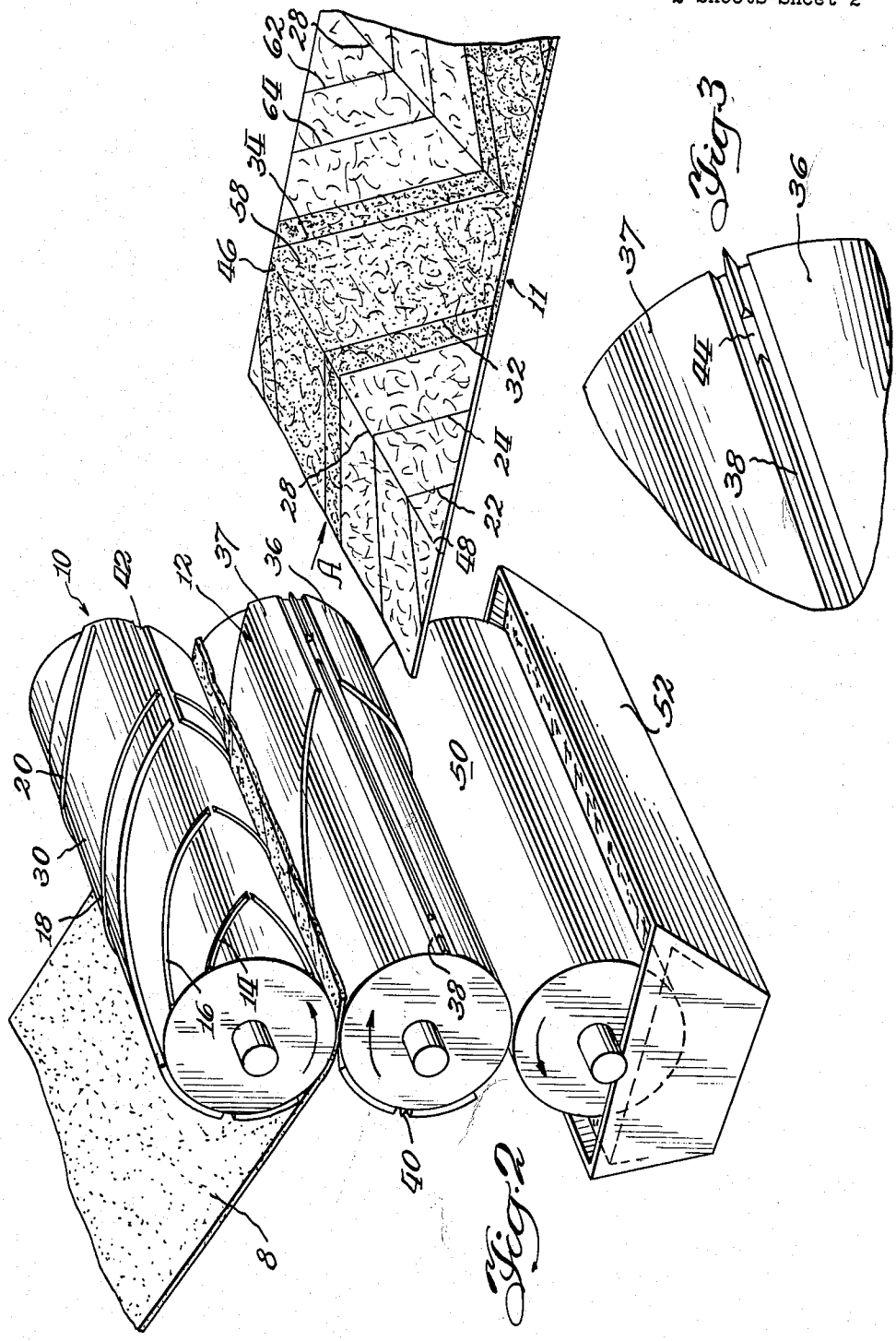


Fig. 2

Fig. 3

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SANITARY NAPKIN ROLL AND METHOD OF MAKING

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This invention relates to improvements in sanitary napkins.

A primary object of the invention resides in the provision of an improved low cost sanitary napkin adapted to be marketed in roll form and overfolded prior to use.

Another object of the invention is to provide an improved sanitary napkin adapted to be fabricated in the form of an elongate assembly comprising a plurality of lightly interconnected units, each of which upon being torn from said assembly may easily be folded in a manner to provide an effective low cost napkin.

Another object is to provide a low cost sanitary napkin of inexpensive construction, making possible the manufacture thereof in one country and economic shipment abroad under minimum bulk conditions.

Another object is to provide an improved sanitary napkin of extremely simple construction and which utilizes fluid absorbent elements to maximum advantage.

Other objects and advantages will become apparent to persons skilled in the art upon examination of the specification and drawings.

In the drawings, in which like parts are identified by the same reference numerals,

FIG. 1 illustrates diagrammatically elements of a machine designed to fabricate a sanitary napkin of the type herein taught.

FIG. 2 shows in perspective the embossing rolls illustrated diagrammatically in FIG. 1, and a resulting product.

FIG. 3 illustrates in enlarged detail a portion of the structure of FIG. 2.

FIG. 4 shows in perspective the sanitary napkin roll product of FIG. 2 in folded configuration.

FIG. 5 shows in elevation a sectional view of a sanitary napkin taken at 5—5, FIG. 4.

As shown in FIG. 1, a strip of backing material is continuously drawn from a feed roll 4 and applied to the under side of a strip comprising plural layers of absorbent material as drawn from feed roll 6. The resulting laminate 8 is then drawn through a nip defined between an embossing roll 10 and a printing roll 12. Embossing roll 10 is provided with two sets of embossing lands disposed on opposite semicylindrical portions of the roll surface, a part of one set being shown in FIG. 2 at 14, 16, 18 and 20.

Lands 14, 16 are narrow rib-like elements of a configuration repetitively to form embossed panel fold lines 22, 24 respectively along laminate 8, the panel portions 11 being defined by partially cut transverse lines 28 during passage of laminate 8 between rolls 10 and 12. Wire-like lands 18, 20 are disposed on the surface of roll 10, which preferably consists of a thin rubber backing element 30 to form panel fold lines 32, 34 respectively. Element 30 is somewhat wider than and serves as a backing for printing land 36 of roll 12. Both the printing and embossing lands extend helically along semicylindrical surfaces of their respective rolls. Roll 12 is further provided with two longitudinally extending cutters 38, 40 positioned to contact roll 10 intermediate the sets of embossing lands, for example along line 42, and to cut the strip of absorbent material with gauze backing transversely of the assmbly along lines 28. Cutters 38, 40 are provided with relieved portions which may be confined to positions adjacent each margin, as shown at 44, FIG. 3, or may be repetitively spaced along the blade to provide light interpanel bonding as at 46, 48.

A material in liquid form which upon drying imparts fluid imperviousness to a treated material is picked up by an applicator roll 50 from a pan 52 and applied to printing lands 36, 37. The material is transferred to laminate 8 by printing lands 36, 37 impregnating panels 11 in area 58. Rolls 10 and 12 are driven in counterrotation as shown in FIG. 2, and as laminate 8 is drawn therebetween cutters 38, 40 define individual panels 11 which simultaneously are embossed to form the fold lines shown in FIG. 2 while being impregnated as above described to render the panels fluid impervious throughout areas 58. Thus a finished product is fabricated in a single pass through the above described machine.

The resulting assembly of lightly interconnected panels is thereafter wound about a core to form a roll 60, of for example twelve interconnected napkins. Uncut portions such as 46, 48 may be, for example, one-fourth to one-half inch wide and are easily torn by the user to remove a panel 11 from roll 60. To further facilitate tearing individual panels 11 from roll 60 the gauze backing strip is of a width equal to the length of cutters 38, 40, hence is completely severed thereby to avoid the necessity of marginally tearing that element.

As best shown in FIG. 2, the sanitary napkin stock formed and partially severed into panels 11 above described consists of a plurality of layers of absorbent material, for example, eight layers of creped wadding or the like and an underlying layer of backing material such as gauze. Each sanitary napkin in the flat form of panel 11 is provided with a plurality of obliquely disposed spaced fold lines 62, 64, 34, 32, 24, and 22 extending between side margins and transverse cut lines 28 as shown. The central area 58 shown shaded in FIG. 2 is rendered fluid impervious and strengthened by treatment with a wax emulsion, for example a 15% concentration of Paracol 404–A, or a similar emulsion. It will be noted that the treated area 58 extends outwardly of fold lines 34, 32, thus providing fluid impervious areas which enclose the infolded nontreated panel portions when panel 11 is folded as described below into sanitary napkin configuration shown in FIGS. 4 and 5.

After tearing an individual panel 11 from roll 60, FIG. 1, the user infolds diagonally disposed corner portions, one portion being infolded along lines 22, 24 and 32, and the opposite corner portion being infolded along lines 62, 64 and 34, with resultant overlapping of absorbent layers. Panel 11 when folded into the sanitary napkin configuration of FIGS. 4 and 5 consists of a plurality of layers of absorbent material overlying a single layer of fluid impervious material. It will be noted that several overfolded absorbent layers are thus positioned within a central area of the resulting napkin to insure maximum utilization of absorbent material.

As above mentioned, the impregnant applied to the area 58 which serves as the underside of the napkin during use, extends somewhat into the contiguous panels laterally of fold lines 32, 34, hence when in the folded configuration of FIG. 5, those treated lateral areas serve as fluid impervious napkin side walls to insure against staining of undergarments. The resulting napkin includes opposed tapered end portions which provide tabs 66 to facilitate attachment to supporting belts or undergarments.

I claim:

1. A method of fabricating an elongate assembly of interconnected detachable segments each of which is

adapted for folding by the user into an in dividual sanitary napkin, said method comprising the steps of plying up elongate layers of normally absorbent material with a substantially coextensive supporting layer of gauze-like webbing to form a laminate; continuously embossing the upper side of said laminate with a plurality of spaced parallel fold lines disposed obliquely and at alternating angles along the length of said material to define a symmetrical zig-zag pattern, two centrally disposed fold lines in said pattern defining a relatively wide central strip-like area extending diagonally to alternate edges of said laminate and other of said fold lines defining a plurality of diagonal strip-like areas of lesser width adjacent said central area; simultaneously impregnating the underlying side of said laminate in the central strip-like area with an impregnant to render fluid impervious the normally absorbent material in said laminate in said central area; cutting lines of patrial severance transversely across said laminate at regularly spaced intervals to provide interconnected readily detachable segments, said cut lines being spaced to intersect the points where said fold lines change direction; and forming a plurality of said interconnected segments into rolls.

2. As an article of manufacture, a roll consisting of a plurality of interconnected detachable panels of laminated material, each panel of which is adapted for folding by the user into an individual sanitary napkin, said roll consisting of an elongate laminate in which selected areas have been rendered substantially fluid impervious and which comprises a layer of normally absorbent material backed with a substantially coextensive layer of gauze-like webbing; said laminate being divided into a plurality of interconnected rectangular panels by spaced, partially cut transverse lines of weakening to permit easy severance of said panels; each of said panels being embossed with a plurality of diagonally disposed parallel fold lines dividing said panel into a number of strip-like areas extending obliquely of the longitudinal axis of the laminated material, the oblique disposition of said fold lines with respect to said axis being reversed for alternate panels; two of said fold lines defining a relatively wide central strip-like area extending between diagonally disposed corners of each panel, and other of said fold lines defining strip-like areas of lesser width disposed laterally of each side of said central area to facilitate folding said areas of lesser width over said central area; said central area containing an impregnant to render the normally absorbent material in said central area substantially fluid impervious.

3. The article of manufacture of claim 2 in which the impregnant consists of a wax emulsion.

4. Sanitary napkin stock in flat form adapted for folding into a sanitary napkin by the user, said napkin stock comprising a rectangular laminate in which a selected area has been rendered substantially fluid impervious and which consists of layers of normally absorbent material and an underlying layer of gauze-like webbing, said laminate provided with plural lines of embossing disposed in parallel spaced relation obliquely of said rectangle, two of said lines defining a relatively wide central strip-like area extending between two diagonally disposed corners and other of said lines defining adjoining strip-like areas of lesser width to facilitate folding said areas of lesser width over said central area, said central area containing an impregnant to render the normally absorbent material in said central area substantially fluid impervious.

5. The sanitary napkin stock of claim 4 in which the impregnant consists of a wax emulsion.

6. A folded sanitary napkin of unitary construction having a substantially fluid impervious bottom layer and multiple layers of fluid absorbent material folded thereover, said napkin being fabricated from sanitary napkin stock comprising a single rectangular laminate in which a selected area has been rendered substantially fluid impervious and which consists of layers of normally absorbent material and an underlying layer of gauze-like webbing, said laminate having a plurality of spaced diagonally disposed fold lines, two of said lines defining a relatively wide central strip-like area extending between two diagonally disposed corners of said rectangle, and other of said lines defining a number of adjoining strip-like areas of lesser width disposed laterally of each side of said central area, said strip-like areas being overfolded from the corners inwardly on each of said fold lines to provide multiple layers of absorbent material overlying said central area, said central area containing an impregnant rendering the normally absorbent material in said area substantially fluid impervious.

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