

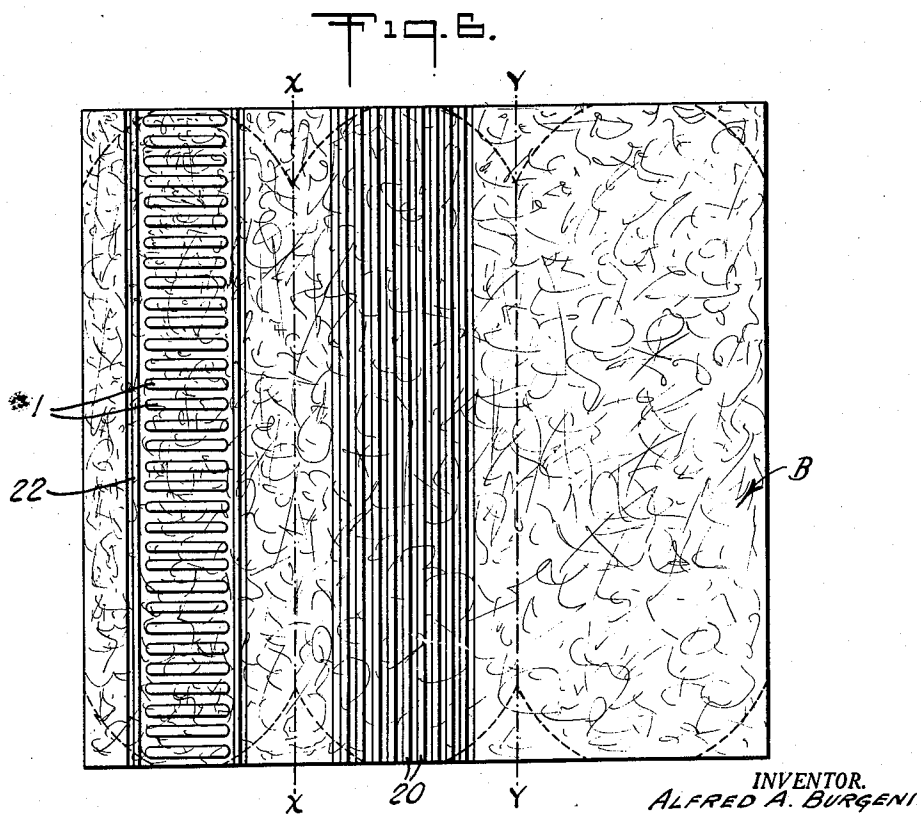
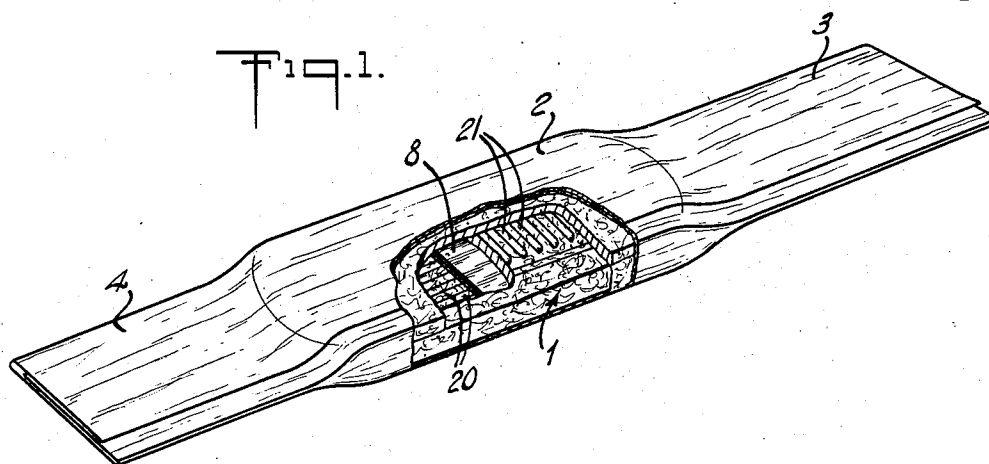
Sept. 13, 1960

A. A. BURGENI
ABSORBENT PRODUCT

2,952,259

Filed April 18, 1956

2 Sheets-Sheet 1



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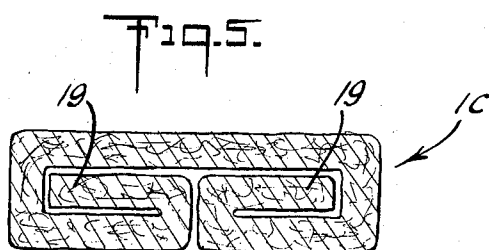
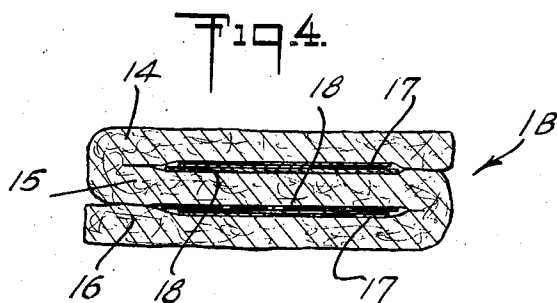
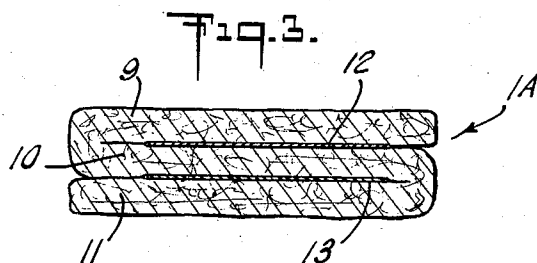
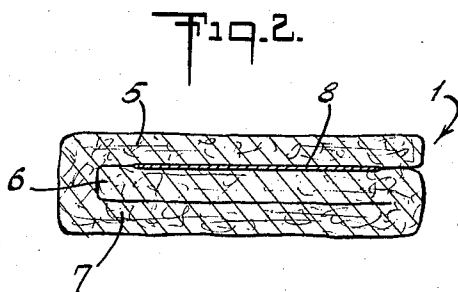
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A. A. BURGENI
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2 Sheets-Sheet 2



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2,952,259

ABSORBENT PRODUCT

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10 Claims. (Cl. 128—290)

This invention relates to improvements in absorbent dressings such as sanitary napkins and, more particularly, to sanitary napkins comprising a textile cover and an absorbent pad comprising a plurality of webs or bats of loosely integrated absorbent fibers as an absorbent component in the pad portion of such napkins.

The pad portion of sanitary napkins of this type is generally of multi-ply structure formed by superposing a plurality of individual webs or layers of various materials having different physical characteristics which impart desired properties to the napkin. For example, commercially successful sanitary napkins usually consist of one or more plies of loosely integrated absorbent fibers in the form of webs or bats arranged in various laminar constructions with other materials such as plies of creped tissue, moisture-impermeable or water-repellent paper, high bulk paper wadding, and the like.

In multi-ply structures of the type described, the individual plies are superposed in various overlapping relationships with respect to one another. However, because they are merely laid on top of one another and held together purely by frictional engagement, these individual plies tend to shift and slide on each other and to separate and bend independently when side pressure is applied to the pad as in the case when the sanitary napkin is being worn.

In attempts to overcome this problem, it has been the practice to wrap the multi-ply pad in an envelope, such as creped tissue paper, to confine the plies and to maintain them in their respective positions within the outer textile cover. Maintaining the plies in position by enveloping them in this manner has not proven completely satisfactory because the plies still tend to slide on one another and cause the pad to become distorted and deformed and make it uncomfortable to wear. Additionally, the use of such envelopes has increased the manufacturing cost of such structures and has rendered them less economically desirable. In other attempts to overcome the problem, the various layers have been secured to each other with adhesive or other bonding means whereby the sliding and shifting has been prevented. This practice, however, is not wholly satisfactory because of the increased cost involved and because the fluid flow and absorbency characteristics of the pad are undesirably affected.

The multi-ply pads of these prior-art napkins do not conform readily to body contours because of their plied nature and thus are often uncomfortable. For example, the plies of water-repellent paper and creped tissue paper commonly incorporated in the pad to impart stiffness and to control the flow of fluid through the pad often have relatively angular or sharp side edges which cause chafing and irritation. To eliminate this undesirable feature, therefore, the edges of the pad are often covered with separate side strips of softer material, such as cotton or soft paper. This practice is also undesirable since it requires the inclusion of separate elements which, in turn, further increases the cost of manufacture of the napkins.

I have found that the foregoing disadvantages of sanitary napkins may be avoided by initially starting with a web of fibers which is considerably wider than the finished napkin and then reducing the width to the desired size by folding the web upon itself so as to form folded

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multiple layers having the desired width of the finished napkin. In this way, the folded web is an integral structure, each web or ply being firmly united to an adjacent web or ply, which acts as its own envelope, thereby preventing to a considerable extent the slippage of other layers or webs used in conjunction therewith.

In accordance with my invention, therefore, a wide web of loosely integrated fibers is folded upon itself a suitable number of times to form superposed fibrous layers integrally joined to adjacent layers at their side edges between which may be inserted other intermediate layers or webs, such as crepe paper, high bulk wadding, water-repellent tissue, and the like. Alternatively, some of the other layers or webs may be omitted to effect savings in cost while still providing a satisfactory and acceptable napkin. Additional features of my invention include sanitary napkins whose side edges are rounded and soft due to the folded construction and which do not chafe or irritate. The napkin of my invention is inexpensive to manufacture, has cohesive stability and strength, molds readily to body contours, absorbs fluids readily and has good fluid retentivity. Other advantages will become apparent from a consideration of the attached drawing and the following specification.

In the drawing:

Fig. 1 is a perspective view of a sanitary napkin embodying my invention;

Fig. 2 is a vertical cross-sectional view of a napkin illustrating one form of my invention;

Fig. 3 is a vertical cross-sectional view of another napkin embodying another form of my invention;

Fig. 4 is a vertical cross-sectional view of still another form;

Fig. 5 is a vertical cross-sectional view of still another form; and

Fig. 6 is a plan view of a fibrous web, prior to folding, used to form the absorbent pad of the present invention.

The sanitary napkin shown in Fig. 1 comprises an absorbent pad, generally designated by the reference numeral 1, enclosed within an outer textile cover or wrapper 2 of gauze, nonwoven fabric, or other suitable fluid-pervious material. The wrapper 2 may enclose the pad in any desired fashion as, for example, in accordance with conventional practice wherein the ends of the wrapper 2 extend beyond the ends of the pad to provide tabs 3, 4 for attaching the napkin. The body of the absorbent pad 1 comprises a series of layers of highly porous, loosely compacted, disintegrated absorbent fibers, such as cotton linters or disintegrated wood pulp, formed by folding a bat B (see Fig. 6) of such fibers whose original width is, for example, approximately three times the desired width of the pad.

Various folding arrangements are possible. For example, as illustrated in Fig. 2, the fibrous bat B from which the pad 1 is formed may be longitudinally folded in a G type fashion (or reverse G, if so desired) to form three layers of absorbent fibers which are a continuous length. Such a fold is continuous in that the ultimate wrapping of the web always takes one direction (either clockwise or counterclockwise) whereby it may be unfolded by unrolling continuously in one direction. The resultant structure has an upper layer 5, an intermediate layer 6, and a lower layer 7 which are integral with each other and which therefore tend more strongly to remain in their respective positions during use without sliding or shifting. One or more plies of fluid-repellent tissue 8 may be inserted intermediate the respective layers to prevent fluid placed on the outer surface of one of the layers of absorbent fibers from striking through to the opposite bottom layer. In this form of the invention, a napkin having an absorbent pad so constructed

3 may be used as a two-way napkin; that is, either surface of the napkin may be placed next to the body.

In the embodiment shown in Fig. 3, the bat of loosely integrated absorbent fibers from which the pad 1A is formed is folded longitudinally upon itself in an S fashion (or Z, if so desired) to provide three superposed layers 9, 10 and 11 of absorbent material. This type of fold is considered reverse in that the ultimate wrapping of the web takes a clockwise (or counterclockwise) direction for one portion thereof and then an opposite direction for the other portion. As a result, the web cannot be unfolded by unrolling continuously in one direction. One or more plies of water-repellent tissue 12, 13 may be placed between each of the adjacent layers. In addition, layers of creped tissue, or high bulk wadding may be similarly positioned, if desired, to incorporate other physical characteristics to the pad.

It is apparent that numerous variations in structures may be obtained as desired to provide sanitary napkins having certain features. For example, in Fig. 4, there is shown a cross section of an absorbent pad 1B which is formed by folding a web of finely disintegrated wood pulp in an S fashion to provide an upper layer 14, an intermediate layer 15, and a bottom layer 16. In this form of the invention, four to nine layers of high bulk wadding 17 are inserted between each of the folds to increase its absorptive capacity, fluid retentivity, and to impart rigidity to the pad. Two-ply water-repellent tissue 18 is also incorporated between the layers of wadding and the adjacent surfaces of the inner layer of wood pulp. In this form, there is provided a satisfactory two-way napkin which can be worn with either surface adjacent the body.

In Fig. 5 is illustrated another form of folding whereby the ends 19, 19 of the bat are folded so as to fall entirely within the body of the absorbent pad 1C. This provides well-rounded smooth marginal sides with no possibility of chafing or irritation from harsh edges. It is to be observed that this method of folding forms a G and a mirror-image or reverse G.

It is, of course, to be appreciated that the bat or web may be folded more than three times and that folds of four, five, or more times may be accomplished by initially starting with a lighter weight web whereby the finished, folded pad does not become too bulky.

Example 1

A suitable web which may be folded as illustrated in the foregoing examples may be obtained by disintegrating wood pulp in a hammer mill or similar device, air-laying the disintegrated fibers in the form of a bat to a bulk density of about 2500 grains per square yard, lightly compressing the web so formed to integrate the web to some extent, including additional plies of other materials such as shown in Fig. 4, and then folding in the manner desired or required. In addition, after the other plies such as wadding and water-repellent tissue have been properly placed and the web has been folded, the resultant structure may also be lightly compressed.

Example 2

Another web having a bulk density of 4500 grains per square yard was used to form an absorbent pad as illustrated in Fig. 2 with the water-repellent tissue inserted as shown. This pad and the pad prepared in the manner described in the preceding paragraph was inexpensive to manufacture, possessed good cohesive stability and strength, molded readily to body contours in use, absorbed fluids readily and had good fluid retentivity.

The wadding, creped tissue, water-repellent paper or other components which are added as desired, may extend substantially across the full width of the pad. Preferably, however, these other elements are made somewhat narrower than the full width of the pad so that their side edges are within the body of the pad and the

adjacent faces of the fibrous layers are maintained in intimate contact with each other along their marginal edges thus providing soft edges and forming a stable multi-layer pad.

A particularly suitable embodiment of the invention is shown in Fig. 6 which illustrates a relatively thick bat B of absorbent fibrous material, such as finely disintegrated wood pulp, cotton linters, or similar fibrous material which is cut to a size whose length is the desired length of the absorbent pad and whose width is, for example, approximately three times the desired width of the pad. The bat may be obtained from a continuous web of finely disintegrated wood pulp formed by any of the various methods well-known in the art. The web is longitudinally divided substantially into thirds, as indicated by indicia lines x—x and y—y, forming three segments of approximately the same width. The left segment is then folded on line x—x over on top of the center segment and the right segment is in turn folded on line y—y to over-lie the top surface of the left segment, thereby forming a G type fold, or a reverse G fold, depending upon the direction from which the folded web is observed.

If desired, the folded web may be trimmed along the indicated curved dotted lines to form a shaped napkin suitable for enclosing within a wrapper 2. Additionally, the napkin pad may be compressed or embossed with longitudinal lines 20 to control and direct the flow of fluid or with transverse lines 21 and longitudinal lines 22 to provide stability and springiness.

Separate elements containing the longitudinal and/or transverse grooves may be employed to provide the desired direction and control of fluid and springiness of structure instead of using the original web in embossed fashion. These separate elements, which may be made of the same fibrous material from which the remainder of the pad is made, are preferably positioned between the intermediate ply and one or both of the outer plies. If desired, these separate elements may be bonded to the plies they contact. The separate elements preferably are of the same length or shorter than the length of the final pad, are preferably somewhat narrower than its width, are usually initially thicker and preferably have a greater final bulk density. For example, in using a web which has a bulk density of about 3000 grains per square yard and which is about eight inches wide prior to folding to form the pad, the separate elements are made about one and two-thirds inches wide and weigh about 4000 grains per square yard. To incorporate the strip into the napkin, the insert strip is laid down on the central segment of the web prior to folding the web in the manner indicated in Fig. 6 or is laid down on top of the right segment after it has been folded over on the central segment.

Irritation of the parts of the body next to which the pad is worn is prevented because the folded and rounded marginal edges of the pad consist of the soft, finely disintegrated wood pulp fibers. By folding in the manner indicated in the different examples above, the soft fibrous material covers the side edges of the pad. The various elements, such as creped tissue, high bulk wadding and water-repellent paper normally incorporated in such structures are confined substantially within the pad and do not extend to the side edges thereof to cause irritation by chafing as has been heretofore experienced.

The pads may be enclosed within a conventional wrapper in the well-known manner. Other components such as water-repellent side strips positioned along the longitudinal edges of the pad to prevent side spreading of fluid may also be incorporated, if desired. It is therefore apparent that numerous variations and combinations may be used and that the illustrated structural examples may be substituted and altered without departing from the scope of the invention.

I claim:

1. An absorbent product comprising an elongated ab-

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5 sorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship from a continuous web of said fibers said folds being at the side edges of said pad, said pad containing a ply of said fibers having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

2. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship from a continuous web of said fibers, said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

3. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship from a continuous web of said fibers, said folds being at the side edges of said pad, at least one of said plies having longitudinally extending compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

4. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being reversely folded in overlapping relationship from a continuous web of said fibers, said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

5. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in a continuous direction in overlapping relationship from a continuous web of said fibers, said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

6. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising at least three superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship from a continuous web

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of said fibers, said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

7. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship in the shape of a G from a continuous web of said fibers said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

8. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated fibers, said plies being folded in overlapping relationship in the shape of an S from a continuous web of said fibers said folds being at the side edges of said pad, at least one of said plies having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

9. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising at least three superposed absorbent plies of normally loosely integrated, short, cellulosic fibers, said plies being folded in overlapping relationship from a continuous web of said fibers said folds being at the side edges of said pad, the inner surface of an outer ply having compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

10. An absorbent product comprising an elongated absorbent multi-ply pad and a liquid pervious wrapper around said pad, said pad being of integral construction and comprising a plurality of superposed absorbent plies of normally loosely integrated comminuted wood pulp fibers, said plies being folded in overlapping relationship in the shape of a G from a continuous web of said fibers said folds being at the side edges of said pad, the inner surface of an outer ply having spaced, compressed areas of densified fibers in the center portion thereof, said areas of densified fibers terminating inwardly of the longitudinal side edges of said ply to define uncompressed side marginal portions with said side edges, the fibrous material in said side marginal portions being soft and yielding.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,952,259

September 13, 1960

Alfred A. Burgeni

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, list of references cited, after line 75, insert the following:

FOREIGN PATENTS

299,426 Great Britain-----June 27, 1929

Signed and sealed this 4th day of April 1961.

(SEAL)

Attest: ERNEST W. SWIDER

~~XXXXXXXXXX~~
Attesting Officer

ARTHUR W. CROCKER
Acting Commissioner of Patents