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[54] MENSTRUAL NAPKIN
6 Claims, 12 Drawing Figs.

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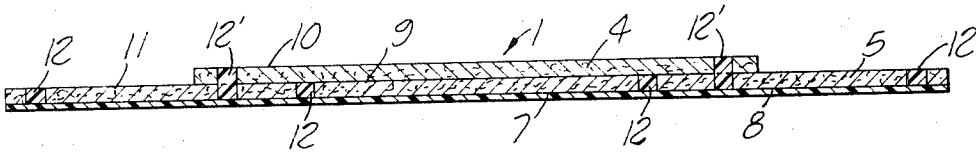
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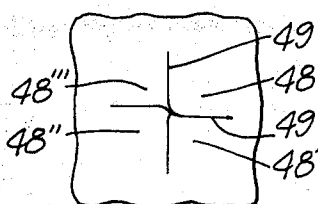
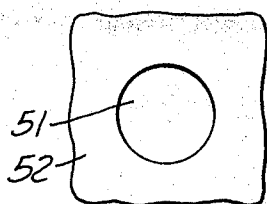
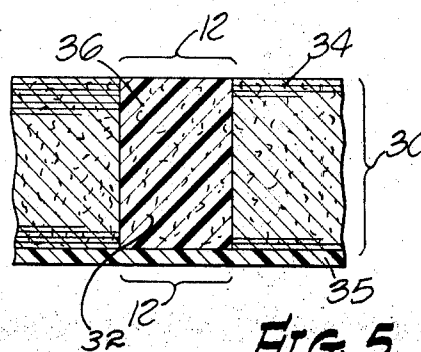
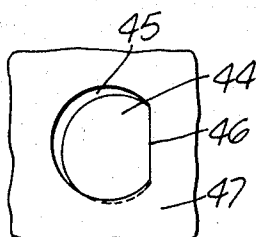
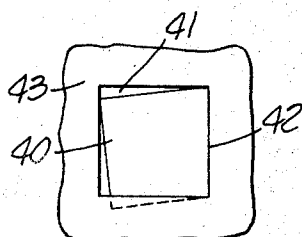
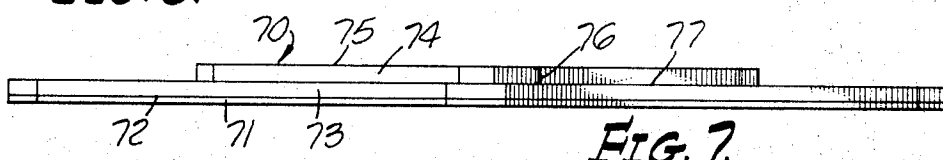
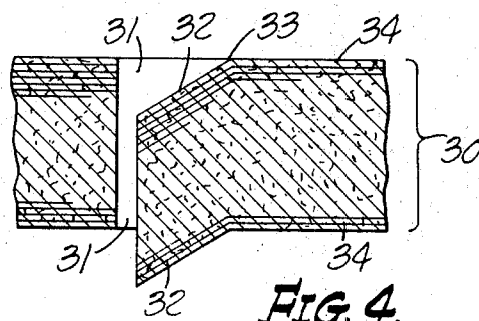
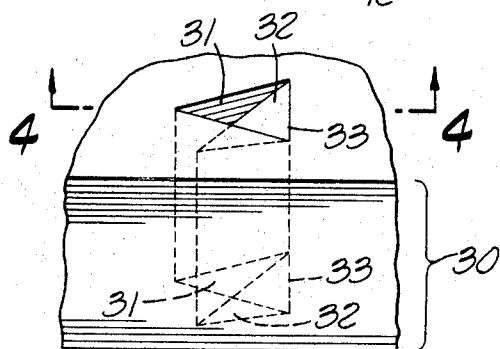
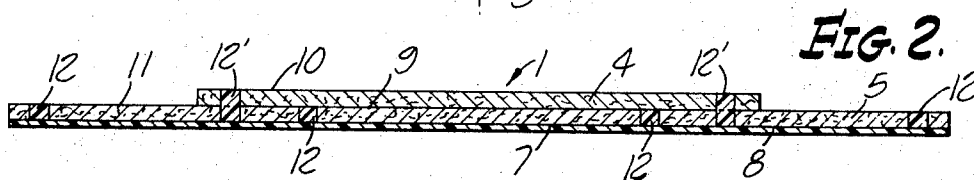
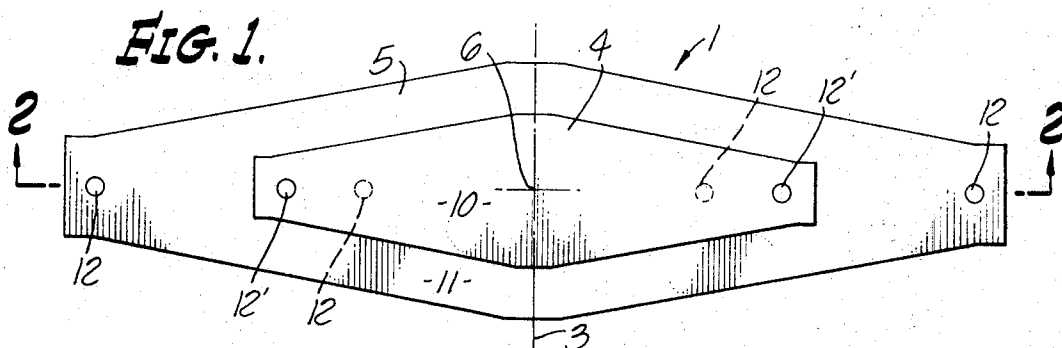
[50] Field of Search 128/284,
287, 290, 296; 264/258

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ABSTRACT: This invention teaches a new menstrual napkin embodying a multiple ply tissue paper construction and an obtuse diamond pattern shape, including a plastic membrane as one layer, wherein the assembly is formed with aligned detent openings in which is placed an adhesive plug.





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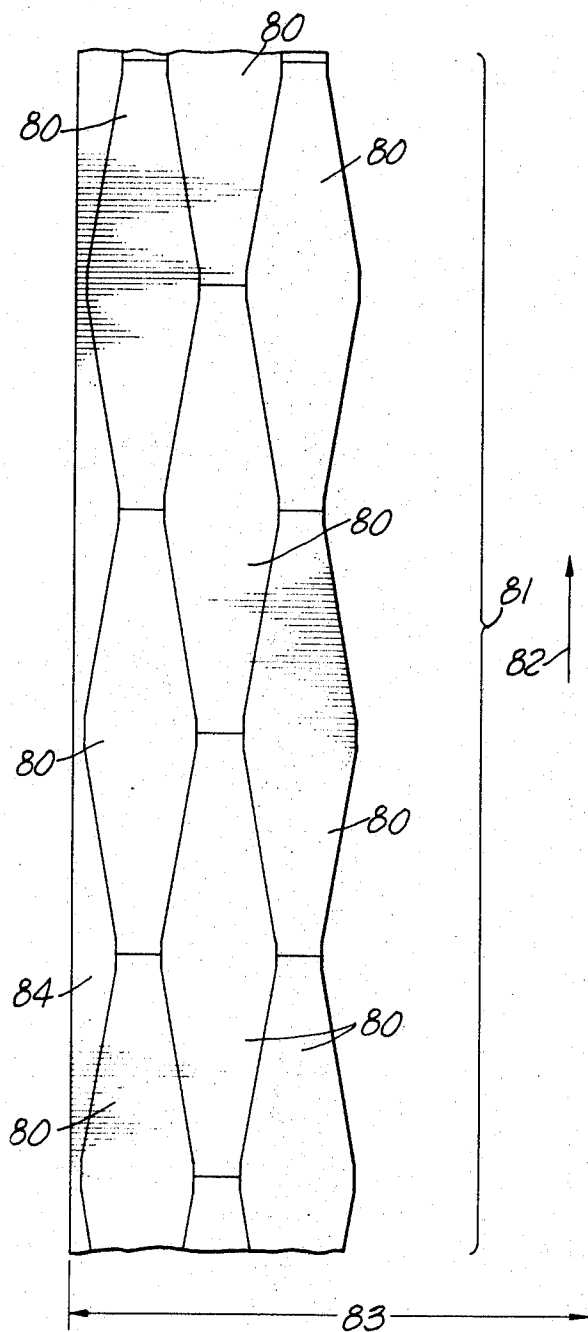


FIG. 8.

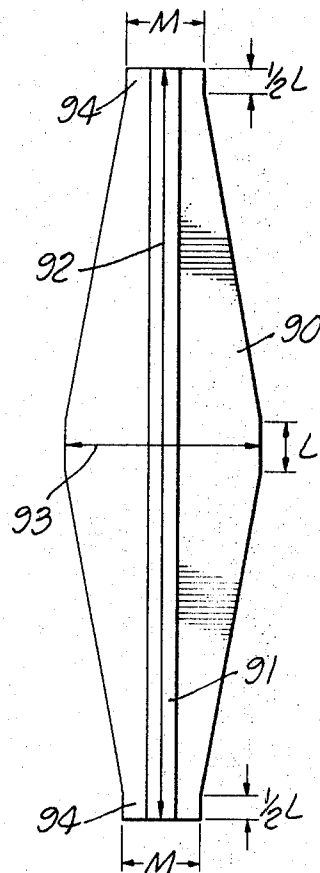


FIG. 9.

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MENSTRUAL NAPKIN

BACKGROUND OF THE INVENTION

Menstrual sanitary napkins are conventionally made of ground, bleached wood pulp which has been shredded and formed into fibrous, fluffy, randomly arranged, low density rectangular shaped pads containing 8 to 9 grams of wood pulp fibers. The pads are typically $8\frac{1}{4}$ inch long x $2\frac{1}{2}$ inch wide x three-quarter inch thick. The pads are typically covered with a nonwoven fabric which provides a shaping and securing means for the wood pulp fibers. The nonwoven fabric is formed longer than the pulp pad to provide end tabs or flat sleeves. The sleeves are used to secure the napkin to a waist belt or holder for female use.

The above type of sanitary napkin is bulky in the stored package. The fluffy pad of wood pulp is also bulky when used by females. Occasionally a napkin leaks menstrual fluid. The napkins do not adapt themselves to a simplified means of positioning themselves on the female torso.

My improvement in menstrual sanitary napkin solves problems produced by the conventional napkins.

SUMMARY OF THE INVENTION

This invention relates to my copending U.S. Pat. application titled "Sanitary Napkin", Ser. No. 675,556 filed Oct. 16, 1967, now U.S. Pat. No. 3,512,530.

The menstrual sanitary napkin of this invention embodies a multiplicity of tissue paper layers adhesively bonded together in multiple ply. The multiple ply of tissue paper are bonded to a thin, flexible, fluid impermeable plastic membrane which is soft to body touch, to form the secondary menstrual fluid absorptive section. The primary menstrual fluid absorptive section can be composed of the above described multiple ply tissue paper or a single layer of highly compressed regenerated cellulose sponge. The primary absorptive section is shaped to fit adjacent to and confront the vaginal vestibula area. The primary absorption section is centered on, and adhesively secured to the absorptive face of the secondary absorptive section.

Included in the objects of this invention are:

First, to provide a dry, single use, compact menstrual sanitary napkin made from inexpensive wood pulp tissue paper.

Second, to provide a thin, single use menstrual sanitary napkin adaptively conforming to and confronting a vaginal vestibula area during use.

Third, to provide a menstrual sanitary napkin having an overall planar obtuse diamond shaped area, which can be plurally manufactured simultaneously and inexpensively.

Fourth, to provide an adhesive bonding means suitably securing together multiple plies of tissue paper in a sanitary paper product.

Other objects and advantages of this invention are taught in the following description and claims.

BRIEF DESCRIPTION OF THE DRAWING

The description of this invention is to be read in conjunction with the following drawings in which:

FIG. 1 is a plan view of one modification of the improvement in menstrual sanitary napkin.

FIG. 2 is an elevation view through 2-2 of FIG. 1.

FIG. 3 is a perspective detail view of a preliminary fabrication step, prior to securing together multiple ply of tissue paper.

FIG. 4 is a cross sectional view through 4-4 of FIG. 3, further explaining the fabrication steps.

FIG. 5 is a cross sectional view of an adhesive plug bonding means, securing together a secondary absorptive section and a thin, flexible, fluid impermeable plastic membrane.

FIGS. 6a, 6b, 6c and 6d are perspective plan views of other useful adhesive detent means in single ply tissue paper sheet.

FIG. 7 is an elevational, side view of another modification of the sanitary napkin invention, also embodying an improvement earlier disclosed in the pending U.S. Pat. application, Ser. No. 675,556 of this inventor.

FIG. 8 is a plan view of a multiplicity of obtuse diamond-shaped absorptive sections of this invention, shown arrayed in a web pattern suitable for a manufacturing process.

FIG. 9 is a plan view of an obtuse diamond shape section which is a preferred shape for a primary and secondary absorptive section of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2 in detail, a menstrual sanitary napkin 1 is shown in plan view to have an obtuse diamond planar shape. The primary absorptive section 4 and the secondary absorptive section 5 are coplanarly, coaxially aligned around the intersection 6 of the section line 2-2 and the line of center 3. The primary absorptive section 4 and the secondary absorptive section 5 have the same geometrical pattern, which is designated for simplicity and clarity as an obtuse diamond shape. Both sections 4 and 5 each comprise a multiplicity tissue paper sheets, coplanarly and adjacently laid together. A thin, flexible, fluid impermeable plastic membrane 7 is shown in FIG. 2, and it is equal in area, coplanar with and forms the interface 8 with the secondary absorptive section 5. The primary absorptive section 4 and the secondary absorptive section 5 have the interface 9.

Suitably, the primary absorptive section 4 and the secondary absorptive section 5 each comprise a range of 20-40 sheets of bleached white wood pulp, uncalendered tissue paper, stacked in coplanar confronting layers. The tissue paper has a weight range per unit of area of typically 0.010 to 0.020 gram/sq. in. A typical absorptive section can be 30 stacked sheets of tissue paper, of weight 0.011 gram/sq. in. Other ranges of numbers of tissue paper sheets and paper weights can be fabricated within the scope of this invention.

To avoid the problem of tissue paper particles being lifted off the absorptive sections 4 and 5, and deposited on the vestibula, it is desirable to terminate the face 10 of the primary absorptive section 4 and the face 11 of the secondary absorptive section 5 each with a single facing sheet of nonwoven fibrous fabric of wood pulp, cotton linters or a mix of the two fibers. Suitably, the nonwoven fabric is open and porous, and can have a synthetic resin content and calendered finish sufficient to prevent lint formation on its surface. The nonwoven fabric weight suitably ranges from 0.005 to 0.020 gram/sq. in.

The essential means of securing together the multiple ply of tissue paper and nonwoven fabric face sheets of sections 4 and 5 and the plastic membrane 7 are the adhesive plug bonding means 12 and 12', which are generically illustrated in FIGS. 1 and 2. The adhesive plug bonding means 12 and 12' each comprise a solid adhesive plug extending through a coaxially aligned detent means opening in a multiple ply of tissue paper, including a nonwoven fabric sheet; which alternatively, may or may not terminate at an adhesive bond with a plastic membrane 7.

FIG. 2 shows the primary absorptive section 4 secured by adhesive plug bonding means 12' extending through the secondary absorptive section 5 to bond with the plastic membrane 7, as illustrated in detail in FIGS. 3, 4 and 5. The primary absorptive section 4 can also be bonded together by fabrication steps also illustrated in FIGS. 3, 4 and 5.

The adhesive plug bonding means 12 and 12' broadly comprise a multiplicity of coaxially aligned, adjacent adhesive detent openings in a multiplicity of tissue paper plies in which is placed and secured a hot melt adhesive plug, cooled to ambient room temperature. FIGS. 3, 4 and 5 together illustrate the fabrication of adhesive bonding means 12 and 12'. As shown in perspective view of FIG. 3, the multiplicity of coplanarly stacked ply of tissue paper 30 are shear cut by a male-female cutting die, forming an adhesive detent triangular opening 31 in each tissue paper ply. The opening 31 has a corresponding triangular shaped tissue paper ply leaf 32, which has a leaf hinge 33 securing the leaf 32 to the ply of tissue paper. FIG. 4 illustrates in more detail the sectional view through 4-4 of FIG. 3, showing the stacked ply of tissue paper 30, each ply of which has a shear cut adhesive detent opening

31, formed by the leaf 32 which is attached by the hinge 33 to the single ply of tissue paper 34.

FIG. 5 illustrates a further modification of the structure of FIGS. 3 and 4, showing a complete adhesive plug bonding means 12 or the like. The FIGS. 3 and 4 multiple leaves 32 are flexed on their hinges 33, and the multiple stacked ply of tissue paper 30 are coplanarly and confrontingly placed adjacent the thin, flexible, fluid impermeable plastic membrane 35. A melted, hot melt, high viscosity adhesive is then injected in a controlled volume into the adhesive detent opening 31—leaf 32 combination, which is confronted by the plastic membrane 35. The cooled solidified adhesive coheres the leaves 32, and the plastic membrane 35 into a bonded coherent whole adhesive plug bonding means 12, 12' or the like, solid and nontacky at human body temperature. The adhesive plug bonding means 12 comprises the comingled leaves 32 and the solid adhesive plug 36, together with the bonded area of plastic membrane 35.

In another modification of the adhesive plug bonding means, the bonding means can include only a multiplicity of leaves 32, or the like, comingled with and adhesive plug 36, or the like, located in an adhesive detent opening 32 or the like, without a confronting plastic membrane 36. This modification of the bonding means is particularly suitable in performing the primary absorptive section 4, or the like, before securing section 4 onto the secondary absorptive section 5, or the like.

Although a triangular shaped adhesive detent opening 31 is shown in FIGS. 3, 4 and 5, other geometrical shaped coaxially aligned, confronting adhesive detent means fabricated in the multiple ply of tissue paper are included in this invention. FIGS. 6a, 6b, 6c and 6d show other modifications of useful adhesive detent means of this invention in perspective views in single ply of tissue paper. FIG. 6a illustrates a rectangular shaped paper leaf 40, formed in an adhesive detent opening 41, the leaf 40 having a hinge 42 connected to tissue paper ply 43. FIG. 6b illustrates a circular shaped paper leaf 44 formed in an adhesive detent opening 45, the leaf 44 having a hinge 46 connected to the tissue paper ply 47. FIG. 6c illustrates a quartet of four paper leaves 48, 48' 48'' 48''' formed about the adhesive detent cross-slit opening 49 in the tissue paper ply 50. FIG. 6d illustrates a further modification of the adhesive detent means in which a circular adhesive detent opening 51 is located in a tissue paper ply 52, there being no tissue paper leaf.

All of the adhesive detent means illustrated in FIGS. 6a, 6b, 6c and 6d, as well as in FIGS. 5 and 6, can be injected with a controlled volume of a hot melt adhesive filling the adhesive detent opening, providing a solid adhesive plug on cooling, which bonds the multiple ply of tissue paper together. The hot melt adhesive is selected from a chemical composition which will also adhesively bond to the confronting plastic membrane 35, or the like, of FIG. 5.

The adhesive plug bonding means 12, 12' and the like, are sized to provide adhesive detent openings typically ranging from one-eighth to one-fourth inch long in a flat paper sheet linear dimension. The means 12, 12' and the like should be adaptively placed and spaced in the napkin to provide no irritation to the female torso when in use.

A hot melt adhesive, free from water or other solvents which readily wet tissue paper, is preferred, since the adhesive should not wet and extensively migrate through the tissue paper by capillary attraction. A hot melt adhesive is free from solvent and can be rapidly cooled to a nontacky solid. The viscosity of the molten adhesive should be high, in order to decrease plastic flow of the melt. A hot melt adhesive viscosity of 12,000—18,000 centipoise at an injection temperature of 190°F. is typically suitable for an adhesive bonding to polyethylene. A highly plasticized vinyl chloride polymer may be used as a hot melt adhesive for a very flexible polyvinyl chloride membrane 7 or the like. Hot melt adhesives based on fatty acid polyamides, as well as adhesives based on properly formulated plasticized polyvinyl acetate and like polymers may also be utilized. It is essential the hot

melt adhesives remain solid and nontacky at human body temperature and in commercial storage, up to 160°F. or the like. Likewise, the adhesive compositions should not be toxic or tend to promote skin allergies.

FIG. 7 illustrates another modification of a menstrual sanitary napkin 70 of this invention in which a side elevational view shows the several components in exaggerated scale due to drawing size limitation. The thin, flexible, fluid impermeable plastic membrane 71 is secured at the interface 72 to the secondary absorptive section 73. The planar shape of the secondary absorptive section 73 can be similar to section 5 of napkin 1.

In the napkin 70, the primary absorptive section 74 comprises a planar, dry, regenerated cellulose, fine pore sponge volume, whose sponge volume is dimensionally compressed normal to the planar face of the sponge volume, minimizing the pore size openings. The uncompressed, fine pore sponge volume from which the absorptive section 74 is fabricated may typically be one-fourth inch thick, before being compressed normal to the face 75 to about one-thirty second inch thickness represented by thickness 76. The absorptive section 74 is adhesively bonded to absorptive section 73 at the interface 77 by a hot melt adhesive as disclosed in the copending U.S. Pat. application Ser. No. 675,556. The same application also discloses and claims menstrual fluid absorptive section having a planar, dry, regenerated cellulose, fine pore sponge compressed normal to the planar dimension to minimize pore size openings.

A regenerated cellulose absorptive section 74 also is useful as a rapid and relatively large capacity menstrual fluid absorber. Section 74, like other primary absorptive sections, can primarily absorb menstrual fluid and allow the fluid, by capillary attraction, to flow to the larger area secondary absorptive section for storage purposes. It is desirable to have a planar area primary absorptive section proportioned in area to confront a vaginal vestibula. The quantity, weight/area, and number of tissue paper plies in a primary or a secondary absorptive section will be determined by the required volume of menstrual fluid to be absorbed under conditions of use of the menstrual sanitary napkin.

The obtuse diamond planar shapes of napkin 1 are particularly suited to manufacturing both primary and secondary absorptive sections simultaneously in multiple numbers. FIG. 8 illustrates the obtuse diamond planar shape pattern of a multiplicity of absorptive sections 80 adapted to be cut from a web of coplanarly confronting multiple tissue paper ply. The shape of the absorptive sections 80 and the napkin 1 are well adapted to conform to the required position for use on the female torso. Likewise, the absorptive sections 80 can be cut from a web, rapidly and efficiently, without substantial loss of web raw material, except for selvage 84 along the web edge. The obtuse diamond planar shape 80 as shown in the multiple pattern of FIG. 8 illustrates that a web 81 can be moved through a die cutting operation in the direction 82. The web 81 has a width 83, typically corresponding to 16 napkins being simultaneously die cut from a width 83 of 29¼ inch, or the like, allowing a small selvage loss.

FIG. 9 more specifically illustrates the geometrical requirement for the obtuse diamond planar shape of napkins 1, 70, and web pattern shape 80. The planar shape 90 has the obtuse diamond geometry adapted to properly applying the pressure sensitive adhesive napkin securing means of the copending U.S. Pat. application, Ser. No. 675,556, in the proper geometrical position in a multiple fabrication operation, as in the web 81. The pressure sensitive adhesive strip 91 is coaxially located along the major axis 92 of the shape 90. The minor axis 93 bisects the obtuse flat length L of the diamond shape 90. The rectangular shaped tip 94 has a length one-half L and a tip width M. Thus, referring again to FIG. 8, the pattern of the web 81 can be constructed for a secondary absorptive section, allowing typical range for 92 of 6 to 9 inches, and for 93 of 1½ to 3 inches. The L length typically ranges from ½ to 2 inches and width M typically ranges from ½ to 1 inch. The pri-

mary absorptive section, smaller in planar area in order to confront the vaginal vestibula, is similarly proportioned to the above secondary absorptive section dimensions. The primary absorptive section may be separately fabricated, using the adhesive plug bonding means of this invention, then securing the primary absorptive section to the secondary absorptive section, as disclosed in the copending application U.S. Ser. No. 675,556.

Many modifications and variations of my improvements in menstrual sanitary napkins and process for their manufacture may be made in the light of my teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

I claim:

1. A menstrual sanitary napkin comprising:

- a. a planar area, compressed multiple ply, tissue paper primary absorptive section, having an area equivalent to a vaginal vestibula area,
- b. a planar area, compressed multiple ply, tissue paper secondary absorptive section, having an area substantially greater than said primary absorptive section,
- c. a thin, flexible, fluid impermeable plastic membrane equal in planar area to said secondary absorptive section, and coplanarly confronting one face of said secondary absorptive section, and
- d. a plurality of adhesive plug, bonding means securing together said planar area, compressed, multiple ply, primary absorptive section, said planar area secondary absorptive section, and said fluid impermeable planar membrane in a coaxially centered, coplanar laminate.

2. A menstrual sanitary napkin of claim 1 in which said primary absorptive section comprises a planar area of dry, fine pore regenerated cellulose, one piece sponge, compressed normal to said planar area to minimum pore volume, said planar area equivalent to a vaginal vestibula area, and said primary absorptive section secured to said secondary absorptive section by adhesive film covering a minor area of said primary absorptive section.

3. A menstrual sanitary napkin of claim 1 in which said plurality of adhesive plug bonding means each comprise a solid, nontacky adhesive plug comingled with coaxially aligned leaf detents located in leaf detent openings.

4. A menstrual sanitary napkin comprising:

- a. an obtuse diamond shaped planar area, compressed multiple ply tissue paper, having a planar area equivalent to a

vaginal vestibula area, and forming a primary absorptive section,

- b. an obtuse diamond shaped planar area, compressed multiple ply tissue paper, having a planar area substantially greater than said primary absorptive section, and forming a secondary absorptive section,
- c. a thin, flexible, fluid impermeable plastic membrane equal in planar area to said secondary absorptive section, and coplanarly confronting one face of said secondary absorptive section, and
- d. a plurality of adhesive plug bonding means securing together said multiple ply, tissue paper planar area primary absorptive section, said planar area secondary absorptive section, and said fluid impermeable planar membrane in a coaxially centered, coplanar laminate, said adhesive plug bonding means comprising a solid adhesive plug extending through the coaxially aligned, confronting detent openings in the multiple ply of tissue paper, said adhesive plug permanently bonded to said plastic membrane.

5. A menstrual sanitary napkin of claim 4 in which said primary absorptive section comprises an obtuse diamond shaped planar area of dry, fine pore, regenerated cellulose, one piece sponge compressed normal to said planar area to minimum size pore openings, said planar area equivalent to a vaginal vestibula area, and said primary absorptive section secured to said secondary absorptive section by adhesive film bonding a minor area of said primary absorptive section.

6. A menstrual sanitary napkin comprising:

- a. a planar area, compressed primary absorptive section having an area equivalent to a vaginal vestibula area,
- b. a planar area, compressed secondary absorptive section having an obtuse diamond shaped area substantially greater than said primary absorptive area,
- c. a thin, flexible, fluid impermeable plastic membrane equal in planar area to said secondary absorptive section, and coplanarly secured to said secondary absorptive section,
- d. said obtuse diamond shaped area having a major axis length ranging from 6 to 9 inches, a minor axis ranging from 1½ to 3 inches, a value of L as shown in FIG. 9 ranging from one-half to 2 inches, and a value of M as shown in FIG. 9 ranging from one-half to 1 inches, and
- e. a plurality of adhesive plug bonding means securing together said primary absorptive section, and said secondary absorptive in a coaxially secured coplanar laminate.