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[54] **NONWOVEN FABRIC**
9 Claims, 2 Drawing Figs.

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[50] **Field of Search** 15/209; 161/57–59, 85, 141, 142, 148, 156, 402; 156/179, 291

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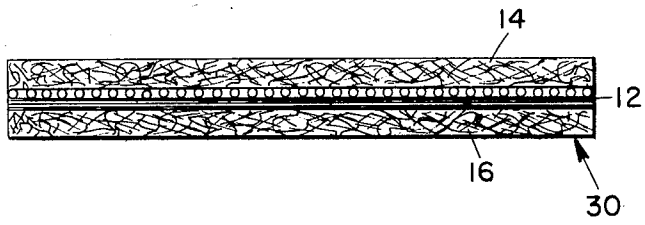
ABSTRACT: Disclosed is a nonwoven fabric having high-strength properties. The nonwoven fabric is comprised of a nonwoven scrim sandwiched between at least two outer layers of nonwoven staple fibers such as cellulosic fibers. The outer layers are adhesively bonded to one another through openings in the scrim. The scrim is comprised of at least two webs, each web being comprised of a plurality of essentially parallel, continuous monofilament strands of a synthetic hydrophobic polymer. The strands of the scrim are either unbonded or only lightly bonded to one another and to the outer layers whereby they have a substantial degree of movement when stress is applied.



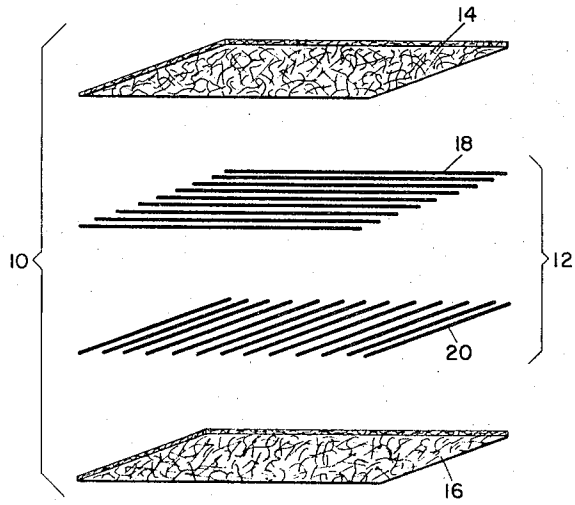


FIG. 1

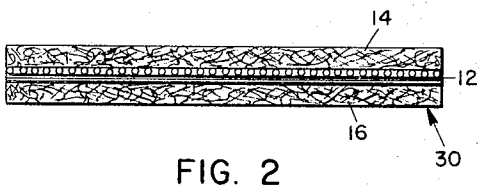


FIG. 2

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NONWOVEN FABRIC

This invention relates to nonwoven sheet material. Particularly, this invention relates to composite reinforced nonwoven fabrics of the disposable type that have high-strength properties and a high degree of drape.

Nonwoven materials, made by a variety of methods, are specifically designed to meet requirements of particular end-uses. A number of nonwoven products, such as apparel interlinings and needle-punched carpets, are reusable and usually quite durable.

Recently, certain nonwoven fabrics have gained widespread use in the manufacture of disposable work garments, disposable bed linens, disposable surgical drapes, disposable cleaning cloths, and the like. Nonwoven fabrics for such uses should be relatively inexpensive and should have high-strength properties. In addition, they should be very pliable, that is, they should possess a high degree of drape.

An object of this invention is a relatively inexpensive nonwoven fabric of high-strength properties and excellent drape adapted for use in the manufacture of disposable garments, disposable bed linens and the like.

Other objects of this invention will, in part, be obvious and will, in part, appear hereinafter.

For a complete understanding of the nature and the objects of this invention, reference is made to the following detailed description and drawing in which:

FIG. 1 is an exploded diagrammatic view of an assembled nonwoven product prior to bonding of the outer layers to one another, and

FIG. 2 is a cross section through a nonwoven fabric prepared from the assembly shown in FIG. 1.

In accordance with this invention there is provided a nonwoven fabric of high-strength properties and excellent drape. The nonwoven fabric is relatively inexpensive and is adapted particularly for use in the manufacture of disposable products such as disposable work garments, disposable bed linens, disposable cleaning cloths, and the like.

The nonwoven fabric of this invention is a composite structure which is comprised of an inner reinforcing, nonwoven ply and at least one outer nonwoven ply disposed on each side of the inner reinforcing ply. The outer plies are adhesively bonded to one another through openings in the inner ply and are essentially unbonded to the inner ply.

The inner reinforcing nonwoven ply, hereinafter referred to as the "scrim," is comprised of at least two webs, the webs being comprised of essentially unbonded continuous monofilament strands. The scrim will be detailed more fully hereinafter.

The outer nonwoven plies are comprised of staple fibers and these fibers will be of a material different from the material of the strands of which the webs of the scrim is comprised. The outer plies are adhesively bonded to one another through openings or interstices in the scrim; however, they are either unbonded or only lightly bonded to the scrim. At most, any adhesive bond between the scrim and outer plies is a poor bond while the adhesive bond between the outer layers is a good bond. Thus, the strands of the webs of which the scrim is comprised, being either unbonded or only lightly bonded to one another and to the outer plies, are free to move when external stress is applied. Thus, for example, when an external stress is applied that would tend to tear the nonwoven fabric, the strands, being free to move, move back, bunch up and reinforce one another and thus provide a rapidly mounting resistance to further tear.

As above set forth, the outer plies are comprised of staple fibers. These fibers can be as short as about one-sixteenth inch and as long as about 2½ inches, or longer if desired. In practice, the fibers will usually have a length of from about one-eighth inch to about 1¼ inch. Many types of fibers can be used in the outer layer and the type of fiber selected will usually depend on the intended use of the nonwoven fabric. For most uses, however, it will be desirable to use those fibers that are inexpensive, that will provide nonwoven fabrics that are soft to the touch, and that have good moisture and water absorbing properties. Thus, preferred fibers will be cellulosic fibers such as wood pulp fibers, cotton fibers, and regenerated cellulose fibers (rayon). Asbestos fibers can be used for those products requiring fire retardant properties. The outer plies have good strength properties. The fibers of which the outer plies are comprised will be well bonded to one another. This bond can be accomplished by means of an applied adhesive or by natural bonding means such as the natural bonding obtained in the manufacture of paper by what is known in the art as the wet or aqueous process.

The outer plies can be comprised of a mixture of different fibers, if desired. Thus, for example, one or more of the outer plies can be comprised of a mixture of cotton linters and wood pulp fibers. Also the nonwoven fabric of this invention can be comprised of two outer plies, each prepared from a different fiber. Thus, for example, the nonwoven fabric can be comprised of two outer plies, one prepared from wood pulp fibers only, and the other prepared from cotton linters only.

The outer plies are preferably prepared prior to assembly of the composite structure. Conventional methods such as the air-laying method and the wet-laying method can be used. In the air-laying method the fibers are usually bonded by means of an applied adhesive. The wet-laying method is particularly suitable when wood pulp fibers are used, use being made of the natural adhesives present to bond the fibers. Conventional mechanical methods such as carding and garnetting can also be employed to prepare the outer plies.

The outer plies can be creped, embossed with a design, or otherwise modified mechanically. Further, the outer plies can be chemically modified. Thus, they can contain chemical additives designed to confer wet-strength properties, increased softness, flame retardant properties, and the like. The outer plies can also contain filler materials such as clays, pigments, waxes, and the like.

The scrim is comprised of at least two webs, each of the webs being comprised of a plurality of substantially parallel, low denier, continuous, monofilament strands of a synthetic thermoplastic hydrophobic material. For ultimate strength properties, the strands of one web will preferably be at an angle of between about 45° and 90° with the strands of at least one other web. For the purposes of this invention, the strands of the webs of which the scrim is comprised must be free to move readily under impact or when external stresses are applied to the laminate. Thus it is preferred that the strands of one web not be bonded to the strands of another web. If, for handling purposes, it is desirable to bond the strands of one web to the strands of another web, then the individual bonds should be of relatively low strength so as to permit the strands to readily break away from one another when an external stress is applied. Thus, all the strands of the scrim have substantial freedom of movement.

The scrim can be comprised of more than two webs if desired. However, the strands of one web will be so arranged as to make an angle of between about 45° and 90° with the strands of at least one other web. Thus, the scrim can be comprised of 3 webs, 4 webs, 5 webs, 6 webs, or more if desired; the webs having the properties described above. The individual strands can have the properties described above. The individual strands can have a denier of from about 2 to about 50, and preferably from about 5 to about 30. Preferably, the strands will have high tenacity of the order of from about 1 grams to 8 grams per denier.

The strands of the webs of the scrim are prepared from a synthetic thermoplastic hydrophobic material. Examples of suitable materials include the polyolefins such as polyethylene, polypropylene, and poly(butene-1); EPM: EPDM; poly(vinylidene chloride); copolymers of vinyl chloride and vinyl acetate; nylon; the polyesters such as poly(ethylene terephthalate); polyacrylonitrile; and cellulose esters such as cellulose acetate and cellulose butyrate.

The strands of the individual webs of the scrim can be of the same or different synthetic thermoplastic hydrophobic materi-

al. The strands can be of different denier and/or of different tenacity. All the strands of the webs of which the scrim is comprised can be of the same synthetic thermoplastic hydrophobic material. In addition, the strands of one web can be of one material and the strands of another web can be of a different material.

A web comprised of substantially parallel continuous monofilament strands that can be used to produce relatively inexpensive nonwoven fabrics in accordance with this invention is the product resulting from fibrillation of striated film of such materials as polypropylene; nylon; polyesters such as poly(ethylene terephthalate); and acrylics such as polyacrylonitrile. Films of blends of these materials can be used. Also a bicomponent film can be used.

The concept of fibrillating a striated film has recently been introduced into the textile art as a method of preparing low denier monofilaments or strands. The striations in such a film provide precisely defined lines of weakness in a direction substantially parallel to the longitudinal axis of the film, i.e., parallel to the direction of orientation. When this oriented, striated film is subjected to mechanical working to cause splitting, such splitting is confined to the thin areas and the thick areas can be separated as continuous strands or filaments. The mechanical working can be sufficient to effect a complete fibrillation of the film. In such a case, the product is a web comprised of a plurality of individual, unconnected, parallel, continuous strands.

If the mechanical working is discontinued prior to complete fibrillation, the product is a web comprised of a network of essentially parallel continuous strands interconnected by means of tiny side fibrils, the fibrils being the residue of the thin areas of the striated film. The tiny side fibrils do not restrict to any substantial degree the freedom of movement of the continuous strands.

A striated film which is fibrillated for use in this invention comprises a thin strip of thermoplastic material such as polypropylene, which is provided with a series of substantially uniformly spaced parallel ribs running longitudinally thereof and interconnected by thin areas or areas of reduced thickness. The film is oriented uniaxially in the direction parallel to the ribs. With uniaxial orientation, the tensile strength in the direction of the axis of orientation is greatly increased while the strength transversely is reduced so that the film can be readily split lengthwise. In comparison with the areas of reduced thickness, the ribs have a relatively high resistance to splitting, so that lengthwise splitting of the film is confined to the areas of reduced thickness and the resulting filaments or strands correspond generally to the ribs.

As indicated above, a striated film can be completely fibrillated to the point where each filament or strand is an entity totally unconnected to an adjacent filament, or it can be only partially fibrillated to form an expandable network structure. Either the partially or completely fibrillated product can be employed in the preparation of the scrim.

The outer plies are adhesively bonded through openings or interstices in the scrim. The adhesive employed is a flexible material and will adhere well to the fibers of the outer plies and it will adhere relatively poorly or not at all to the strands of the scrim. Thus, for example, when the outer plies are comprised of cellulosic fibers, the adhesive employed will adhere reasonably well to these fibers and not at all or relatively poorly to the hydrophobic scrim material. While water-soluble adhesives can be employed, the adhesive will preferably be water-insoluble.

The selection of an appropriate adhesive for use in preparing the nonwoven fabrics of this invention is well within the skill of one versed in art having before him the teachings of this invention. It is well established in the adhesives art that an adhesive can be tailormade to meet certain specific requirements such, for example, as flexibility, certain cohesive properties, toughness, water and grease resistance, wide-temperature-range resistance, fast set, specific adhesion to difficult surfaces, and alkali resistance.

Preferred adhesives will have the following cohesive properties: (a) a tensile strength at rupture of at least about 100 p.s.i., preferably 200 p.s.i. to 500 p.s.i., or greater; (b) an elongation at rupture of at least about 400 percent, preferably 1,000 percent or greater; (c) an initial modulus of less than about 200 p.s.i. per 100 percent elongation, preferably less than 50 p.s.i. per 100 percent elongation; and (d) an average modulus of a value not greater than 800 p.s.i. per 100 percent elongation, preferably less than 200 p.s.i. per 100 percent elongation; in other words, the average slope of the complete stress-strain curve, all the way to rupture, will not be greater than the above values. This stress-strain curve will be either concave upward or approximately linear throughout.

The adhesive employed in this invention will be a flexible organic polymeric material, either natural or synthetic, having the above adhesive properties. The preferred adhesive will have the above cohesive properties. It can be a mixture of two or more polymeric materials. It can be compounded with plasticizers, tackifiers, antioxidants, fillers, and the like.

Copolymers and terpolymers of such monomers as vinyl acetate, vinyl butyrate, vinyl propionate, maleic anhydride, monobutyl maleate, dibutyl maleate, vinyl chloride, vinyl bromide, allyl chloride, ethyl acrylate, butyl acrylate, butyl methacrylate, ethylene, propylene, isobutylene, styrene, alpha-methyl styrene, and acrylonitrile can be tailormade to meet the adhesive requirements of this invention and also the preferred cohesive properties. In addition, homopolymers of certain of the above monomers, such as ethyl acrylate will be suitable. In some instances it may be necessary to compound such polymeric materials with other polymers, resinous materials such as rosin esters, and/or plasticizers to obtain ultimate properties. Again this is within the skill of one versed in the art.

Specific adhesives include natural rubber and synthetic rubbers such as styrene-butadiene copolymers, nitrile rubber, and neoprene; copolymers of vinyl acetate and ethylene; copolymers of ethyl acrylate and acrylic acid; copolymers of ethyl acrylate and N-methylol acrylamide; terpolymers of vinyl acetate, dibutyl maleate, and monobutyl maleate, copolymers of butyl acrylate and acrylonitrile; block copolymers of styrene and butadiene; and block copolymers of styrene and isoprene.

The adhesive can be employed as an aqueous dispersion or as a solution in a suitable solvent therefor. The aqueous dispersion or solution can be applied in any convenient manner such, for example, as by spraying. The amount employed will be such that the nonwoven fabric will contain from about 5 percent to about 30 percent, by weight of adhesive solids based on the total weight of the nonwoven fabric.

Referring now to FIG. 1 of the drawing, there is shown an exploded diagrammatic view of a stacked arrangement of plies **10** comprised of scrim **12** and outer plies **14** and **16**. Scrim **12** is comprised of two webs, **18** and **20**. The webs are comprised of a plurality of substantially parallel, low denier, continuous monofilament strands. If a web is the product resulting from complete fibrillation of striated film the strands will be unconnected; if, as above set forth, mechanical working is discontinued prior to complete fibrillation of the striated film, at least some of the strands will be interconnected by means of tiny side fibrils which do not restrict to any substantial degree the freedom of movement of the strands. It is not essential that the strands be uniformly spaced or that all strands be spaced from one another. Thus, for example, when a web is the product resulting from fibrillation of striated film, several strands of the web may be adjacent one another in flat bundles of from about two to about five strands with no substantial spacing between the strands of the bundle and the web may be comprised of several of these flat bundles spaced from one another and/or from single strands.

Adhesive is applied from either an aqueous dispersion or an organic solvent solution thereof to either the external surfaces of the scrim **12** or to the surfaces of the outer plies adjacent the scrim. Slight bonding pressure is then applied to form non-

woven fabric **30**. Pressure applied will usually be of the order of from about 10 to 100 p.s.i. The formed assembly is subsequently dried at temperatures of from about 180° F. to about 300° F. Nonwoven fabric **30** is comprised of outer plies **14** and **16** and scrim **12**, the outer plies **14** and **16** being bonded together through openings in the scrim by means of the applied adhesive, the strands of scrim **12** being essentially unbonded to one another and to the outer plies **14** and **16**.

Thus, for example, two plies of dry cellulose fibers are air-laid on screens, and the top surface of each ply is sprayed with an aqueous dispersion of an adhesive that will adhere well to cellulose fibers but not to polypropylene. A scrim which is comprised of polypropylene strands is placed between the two damp plies to form a sandwich structure which is passed through a press roll and then dried. Carrier screens are removed and there is provided a nonwoven fabric in accordance with this invention.

In another method, thin, dry, naturally bonded sheets of cellulosic pulp fibers are used as the outer layers. In this method, the adhesive can be applied directly to the outer layers. Alternatively, the adhesive can be applied to both sides of the scrim and the outer plies then applied to the adhesive damp surfaces of the scrim. In this latter method, the scrim serves merely as a carrier for the adhesive. The prepared sandwich structure is then passed through a press roll and subsequently dried to provide the nonwoven fabric.

The following examples are illustrative of this invention. All parts and percentages are by weight unless otherwise specified.

EXAMPLE 1

A dry sheet of bleached kraft soft wood pulp is cut into ½-inch squares, and 25 grams thereof is placed in a blender and defibered during 5 minutes of vigorous agitation. The resulting fluffy, defibered mass is used to air-lay two plies of dry fibers on 100-mesh metal screens about 9 inches square. The weight of each ply is about 1.0 grams.

Each ply, including its carrier screen, is placed in a holder inclined at about 60° to the horizontal, and adhesive, in the form of a 20 percent solids aqueous suspension, is sprayed onto each exposed fiber surface. The adhesive employed is a terpolymer of ethyl acrylate, N-methylol acrylamide, and ethyl methacrylate.

One of the sprayed ply-screen combinations is placed on a table, and a scrim is placed on top of it. This scrim has a basis weight of about 0.5 oz./sq.yd. and is prepared from a striated bicomponent film composed of 4 parts propylene homopolymer to 1 part of propylene-ethylene copolymer containing 2.7 percent ethylene. The striated film is stretched, fibrillated, and spread laterally to form a filamentary web. A portion of this web is crossoverlaid with another web portion at approximately right angles and then bonded moderately by a hot-press treatment, in order to provide a scrim with sufficient coherence for handling purposes. However, the strands of the scrim will readily break away from one another when external stress is applied. The strands of the webs are 23 denier, and have a tenacity of about 1.1 g./denier.

The other sprayed ply-screen combination is then placed on top of the scrim so that the sprayed faces of the two outer plies are adjacent the scrim. This sandwich structure is consolidated slightly by gentle application of hand pressure. The structure is then passed through the press roll of a conventional Noble and Wood laboratory handsheet apparatus. Paper toweling is placed on the outside of both metal screens, in order to protect the rolls from scarring and to absorb any expressed fluid. A moderate pressure of from about 10 to 100 p.s.i. is employed for the press-roll operation. The entire sandwich, including paper toweling, is then passed through a Noble and Wood drum dried, steam heated at about 250° F., during a period of 1 minute. The paper toweling is removed, and the sandwich is inverted and again passed through the drum dried. The carrier screens are removed and the dried nonwoven fabric is weighed.

Standard methods of physical testing are conducted at 73° F. and 50° percent relative humidity after the product has been conditioned in this environment for at least 24 hours. Strength data (tensile, burst and tear) are corrected to 2 oz./sq.yd. basis weight by use of the linear relation $S=kB$, where S represents the strength property and B represents sheet basis weight. Tensile data are obtained on ½-inch or 1-inch wide strips using the Instron tensile tester with a jaw span of 3 inch and the crosshead traveling at the rate of 12 inch/min. (ASTM D1117). Burst is obtained using a Mullen Burst tester in accordance with ASTM D774. Elmendorf tear is obtained on a conventional Elmendorf tearing device with pendulum weight adjustments made as necessary (ASTM D689). Cantilever stiffness is obtained on either ½-inch or 1-inch wide strips in accordance with ASTM D1388.

A test sometimes conducted on nonwoven fabrics is known as the Pierce Tear Test. In this test, using a 3 inch × 3 inch test specimen, two ⅛-inch brass dowels pierce the specimen 1 inch apart, 1½ inch from the sides and 1 inch from the top and bottom. The dowels are moved apart using a 1 inch/minute Instron crosshead speed. The loads at various elongations are recorded.

EXAMPLE 2

Example 1 is repeated except that no scrim is used, and the weight of each deposited fiber web is 1.3 grams.

EXAMPLE 3

Example 1 is repeated with the exception that a scrim having a basis weight of 0.3 oz./sq.yd. is used. This scrim is comprised of two crossoverlaid, partially fibrillated webs prepared from a striated bicomponent film composed of 1 part propylene homopolymer to 1 part of propylene-ethylene copolymer containing 7 percent ethylene. The webs are bonded moderately by a hot-press treatment (pressure of 1 to 10 p.s.i. at 330° F. for 3 minutes). The individual strands of the webs have a denier of 21, a tenacity of 1.1 g./denier. The weight of each outer ply of this example is 1.15 grams.

EXAMPLE 4

Example 3 is repeated with the exception that defibered cotton linters are used in place of woodpulp fibers to form the air-laid outer plies. The weight of each outer ply is 1.15 grams.

EXAMPLE 5

Example 3 is repeated except that an unbonded crossoverlaid scrim made from completely fibrillated striated polypropylene film is used. The individual strands are 21 denier and have a tenacity of 5.1 g./denier. Since the strands of the two webs are unbonded, the scrim is mounted on a metal frame and held under tension. It is cut loose (with resulting mechanical snapback) after the sandwich structure is formed, but before the pressing and drying operations. The dried, nonwoven fabric has a puckered surface.

EXAMPLE 6

Example 5 is repeated with the exception that the scrim is prepared from single 14 denier filaments of melt spun polypropylene. The filaments have a tenacity of 1.7 grams per denier. The scrim consists of two crossoverlaid webs and weighs 0.036 oz. per square yard. Each of the outer plies weighed 1.3 grams.

Table 1 below sets forth properties of the nonwoven fabrics of examples 1 through 6 above. The test results are the average of two test specimens.

TABLE 1

Example	1	2	3	4	5	6
Basis weight (oz./sq. yd.)	2.0	2.0	2.0	1.7	2.2	2.0
Weight percent, outer plies	55	79	73	73	70	78.2
Weight percent, scrim	25	------	14	14	13	1.8
Weight percent, adhesive	20	21	13	13	17	20
Instron tensile (lb./in.)	9.7	[1] 3.4	7.5	5.6	13.7	4.2
Break elongation (percent)	20	------	7.0	7.0	7.5	7.0

Pierce tear (lbs.) at—						
25% elongation	1.0	0.5	0.9	0.5	1.1	0.7
50% elongation	1.5	0.6	1.3	1.0	1.8	0.8
100% elongation	1.9	0.5	1.6	1.8	3.6	0.9
200% elongation	3.0	0.7	----	----	----	1.2
Maximum load	3.1	0.8	1.9	3.7	6.5	1.6
Cantilever stiffness (cm./41.5°)	5.2	5.2	5.8	3.7	7.2	5.5
Thickness (mils)	7.6	----	7.2	7.5	8.0	6.7

[1] Estimated from Amthor Tensile Tester Data.

EXAMPLE 7

Example 5 is repeated with the following exceptions: the polypropylene film is prepared from a polypropylene having a relatively narrow molecular weight distribution; the scrim basis weight is 0.143 oz./sq.yd.; and the filaments are 16.2 denier and have a tenacity of 5.1 gram/denier. A static weight of 0.1 p.s.i. is applied to the formed sandwich structure prior to roll pressing. Each of the outer plies weighs 1.25 grams.

EXAMPLE 8

Example 7 is repeated except that the scrim employed has a basis weight of 0.067 oz./sq.yd. and each outer ply weighs 1.30 grams.

EXAMPLE 9

Example 8 is repeated except that the outer plies are prepared from regenerated cellulose rayon fibers about three-eighth inch long and each weighs 1.45 grams.

EXAMPLE 10

Example 9 is repeated except that the adhesive used is a 1 part to 1 part blend of natural rubber latex and the glycerol ester of hydrogenated rosin in aqueous suspension. Each of the outer plies of this example weighs 1.3 grams.

Table 2 below sets forth properties of the unwoven fabrics of examples 7 through 10.

TABLE 2

Example	7	8	9	10
Basis weight (oz./sq. yd.)	2	2	2.1	2.1
Weight percent, outer ply fibers	79	82	83	78
Weight percent, scrim	7	3	3	3
Weight percent, adhesive	14	15	14	19
Instron tensile (lbs./in.)	8.4	6	6.4	4.1
Break elongation (percent)	16	16	12	9
Mullen burst (p.s.i.)	----	----	----	11.9
Elmendorf tear (grams)	464	417	336	500
Pierce tear (lbs.) at—				
25% elongation	1.1	0.8	0.9	0.6
50% elongation	2.0	1.2	1.2	1.0
100% elongation	3.2	2.2	2.1	2.0
200% elongation	5.3	3.9	2.4	3.5
Maximum load	5.6	4.2	2.6	3.6
Cantilever stiffness (cm./41.5°)	4.8	4.8	5.6	4.4
Thickness (mils)	7.6	7.7	9.0	7.4

While the above description and working examples have been directed primarily to the use of outer plies of staple cellulose fibers, the outer plies can be prepared from other fibers, either natural or synthetic, if desired it being essential, however, that the outer layers be adhesively bonded to one another but not bonded to any substantial degree to the scrim, leaving the scrim strands free to move when external stress is applied.

It is to be understood that the above description and drawing are illustrative of the invention and not in limitation thereof.

What I claim and desire to protect by Letters Patent is:

1. A nonwoven fabric comprised of a nonwoven scrim comprised of at least two webs, each web being comprised of a plurality of essentially unbonded substantially parallel, low denier, continuous monofilament strands of a synthetic thermoplastic hydrophobic material and at least two outer nonwoven plies comprised of staple fibers adhesively bonded to one another through openings in the scrim, the said outer plies being essentially unbonded to the strands of the scrim whereby the scrim strands are free to move and distribute applied stress.

2. The nonwoven fabric of claim 1 when the strands of one of the webs of the scrim make an angle of between about 45° and 90° with the strands of at least one other web.

3. The nonwoven fabric of claim 2 wherein at least one outer ply is comprised of staple cellulosic fibers.

4. The nonwoven fabric of claim 3 wherein the cellulosic fibers are cotton fibers.

5. The nonwoven fabric of claim 3 wherein the cellulosic fibers are woodpulp fibers.

6. The nonwoven fabric of claim 3 wherein the cellulosic fibers are regenerated cellulose fibers.

7. The nonwoven fabric of claim 2 wherein at least one of the webs of which the scrim is comprised is a fibrillated striated film of a synthetic thermoplastic hydrophobic material.

8. The nonwoven fabric of claim 7 wherein the synthetic thermoplastic hydrophobic material is a polymer of propylene.

9. The nonwoven fabric of claim 2 wherein the outer layers are bonded together by a flexible polymeric adhesive having a tensile strength at rupture of at least about 100 p.s.i., an elongation at rupture of at least about 400 percent, an initial modulus of less than about 200 p.s.i. per 100 percent elongation, and an average modulus of a value not greater than 800 p.s.i. per 100 percent elongation.