Feb. 23, 1954

D. K. RIDER

2,670,315

METHOD OF MAKING NONWOVEN FABRIC

Filed March 31, 1949

Fig. 1.

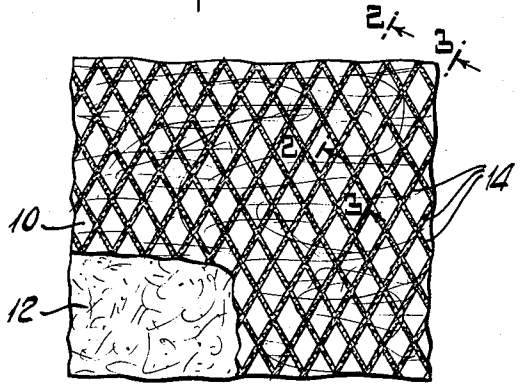


Fig. 2.

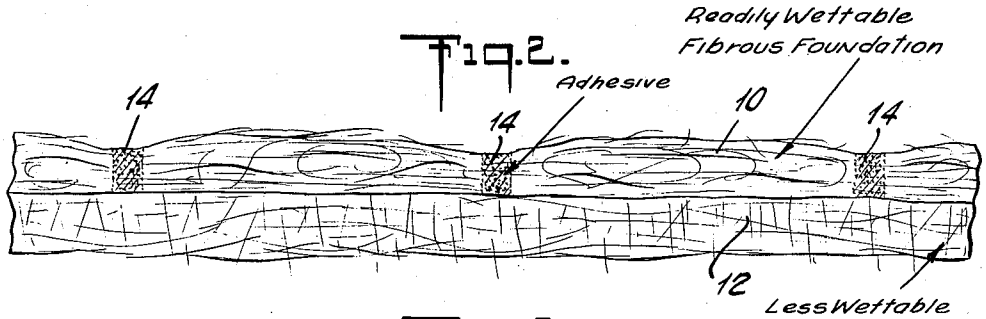


Fig. 3.

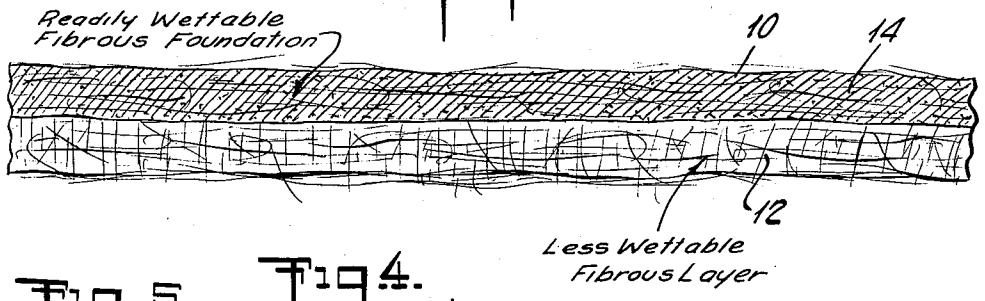


Fig. 5.

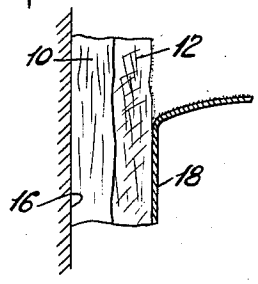
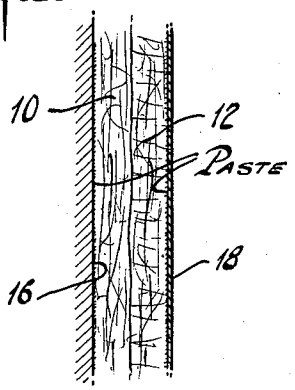


Fig. 4.



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METHOD OF MAKING NONWOVEN FABRIC

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3 Claims. (Cl. 154—122)

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This invention relates to cloth of novel construction and to methods of making it. It is particularly concerned with non-woven fabrics made of the usual textile fibers, by which is meant any fibers suitable to be spun and woven into cloth. Cotton and rayon are prominent examples.

Textile fibers are distinguished especially by their length from other similar but shorter fibers, for example those used in making paper. In fact in some instances identical fibers may be classed as textile fibers or not depending on their length. Therefore as used herein the term "textile fibers" designates fibers suitable for spinning and weaving into cloth by the customary methods of making cloth and the term "textile fabric" or "textile cloth" designates fabric sheet made from such textile fibers whether or not the fabric is woven, knitted, felted or otherwise made.

One of the objects of the invention includes the making of an improved textile fabric in which one of its surfaces has markedly different wettability by water and aqueous adhesives. This aspect of the invention is applicable to filters and to wall coverings, especially to foundation materials to which wallpaper is applied. This embodiment of the invention will be described for the sake of example in connection with such foundation materials.

Other objects and advantages of the invention will be evident in the accompanying description and accompanying drawings.

In the drawings Fig. 1 is a plan of one form of fabric embodying the invention;

Fig. 2 is an enlarged fragmentary section on the line 2—2 of Fig. 1, the section being taken along a bonding stripe;

Fig. 3 is an enlarged fragmentary section on the line 3—3 of Fig. 1 taken between bonding stripes;

Fig. 4 is an enlarged section of a portion of a wall covered with our improved fabric as a foundation for wallpaper; and

Figure 5 is an enlarged section of a portion of a wall covered with my improved fabric as a foundation for wallpaper showing the wallpaper partially stripped away from the wall and the point of rupturing of the laminated layer.

In the Goldman Patent 2,039,312 there is described a non-woven textile fabric formed by superposing carded webs of cotton and binding the fibers together by adhesive material printed or pressed through the webs along separated lines. In the patent to Besso and Habicht 1,532,648 there is described a non-woven textile

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fabric formed by disposing cotton fibers completely at random in an air stream, gathering them on a screen, and suitably binding the fibers, for example by solvent applied at spaced points. In either an ordinary carded web, or a Besso and Habicht web, the fibers or at least a substantial proportion of them are what I call polyposed, by which is meant that the fibers are arranged at random or in many positions, without order or system. This is true in usual carded webs, for although one of the objects of carding is to align the fibers in parallel, complete alignment is not usually achieved. In fact that appropriate settings of the carding machine, and sufficient speed of operation a very high degree of random arrangement can be had. Thus I use the term polyposed to refer to the disordered arrangement of fibers in either a card web or a web of the Besso and Habicht type. In webs of polyposed fibers made by either process there is also a considerable entanglement of the fibers, which aids in holding the fibers together.

In making my improved fabric I form in any suitable manner a foundation 10 of fibers which are readily wettable by water and by particular adhesives, such as starch paste or polyvinyl acetate emulsions. I secure to a face of this foundation a non-woven layer 12 of fibers of a different character, that is they are less wettable by water and such adhesives. Preferably both the foundation 10 and the layer 12 are non-woven webs of polyposed fibers. The fibers in each web are entangled, and preferably the two webs are joined face-to-face by entanglement of the fibers of one web in the fibers of the other. These two webs are then bonded together by any suitable adhesive printed on or into the webs, preferably along separated lines, for example the lines in the diamond grid pattern 14 of Fig. 1.

The difference in the wettability of the fibers may vary widely depending on the characteristics desired in the final fabric and, in fact, the fibers in the web 12 may be practically non-wettable by water or by particular adhesives. As one example, the web 10 may be formed of one or more carded webs of rayon or absorbent cotton such as bleached cotton. The web 12 may be formed of one or more layers of non-absorbent cotton, such as unbleached cotton. The adhesive may be a water emulsion of polyvinyl acetate. The adhesive is ordinarily applied by passing the webs between any suitable printing roll and backing roll (not shown) such as is described by Goldman, the printing roll being in contact with the web formed of wettable fibers so as to

apply the adhesive first to the wettable web and then pressing it through this into the less wetable web. In order to apply the binder adhesive to both kinds of fibers it may be necessary to render all fibers temporarily wettable by the binder by wetting out the webs with a solution of an appropriate known wetting agent just before applying the adhesive.

After the binder is applied the web is dried in any usual manner, for example by passing the fabric over heated drying cans. This reduces the effectiveness of the wetting agent as regards re-wetting of the web, either by reducing its quantity or inactivating it, thus producing a fabric having one side relatively wettable by adhesives such as starch paste, and one side relatively less wettable by the paste. This is particularly useful for a foundation fabric for wallpaper, the surface next to the wall being wettable by such paste in order that this surface may be strongly bonded to the wall while the other surface may be bonded to the wallpaper by a weaker, but adequate bond.

Referring to Fig. 4, 16 designates the surface of a wall which may be wood, composition board or the like. The composite fabric above described is applied to this surface either by tacking at intervals or by any suitable adhesive such as starch paste which forms a relatively permanent bond and which is not readily softened by subsequent application of the adhesive on the wallpaper. The wettable side of the fabric is applied to the surface 16 and the less wettable side is away from the wall. Wallpaper represented by the layer 18 may then be applied by pasting to the less wettable side of fabric in the same manner that paper is customarily pasted on walls.

The material has the advantage that the wallpaper adheres to the fabric and thus to the wall firmly enough to stay in place as long as desired but the fabric enables the paper to be stripped readily from the wall when it is desired to repaper the wall. Whenever it is desired to strip the wallpaper, an edge or corner of the paper is pried loose from the wall by knife or spatula and using this loosened edge as a hold, the paper can be readily stripped without soaking or softening of the paste.

The ability to strip the paper is believed to be due both to the low wettability of the surface layer and to the relatively weak bonding of the paper to this layer. The low wettability permits

limited absorption of the wallpaper paste and prevents the paste from reaching the wettable layer thus preventing the paper from being bonded to the wettable layer. In many instances the ability to strip is also believed to be due to the poor adhesion of the binder to the less wettable fibers in the manufacture of the fabric.

The invention claimed is:

1. The method of making fabric which comprises assembling a layer of relatively wettable fibers and a second layer of less wettable textile fibers, rendering the second layer temporarily wettable by applying an aqueous dispersion of a wetting agent, saturating binding areas of both layers with an aqueous adhesive and evaporating the water in the dispersion of the wetting agent to provide a fabric having a relatively wettable layer of fibers on one surface and a layer of less wettable fibers on the other surface.

2. The method of making non-woven fabric having one relatively wettable surface and one relatively less wettable surface which comprises assembling a layer of readily wettable textile fibers with a layer of less readily wettable textile fibers, saturating the assembly with a water dispersion of an adhesive by applying the adhesive first to the readily wettable layer and then removing the water to leave the adhesive.

3. The method of making non-woven fabric having one relatively wettable surface and one relatively less wettable surface which comprises assembling a layer of readily wettable textile fibers with a layer of less readily wettable textile fibers, saturating the assembly with a water dispersion of an adhesive by first applying the adhesive to the readily wettable layer and then to the less readily wettable layer and removing the water to leave the adhesive.

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