Feb. 2, 1926. 1,571,579

N. L. DURYEA

ARTIFICIAL FABRIC

Filed Sept. 30, 1921

Fig. 1.

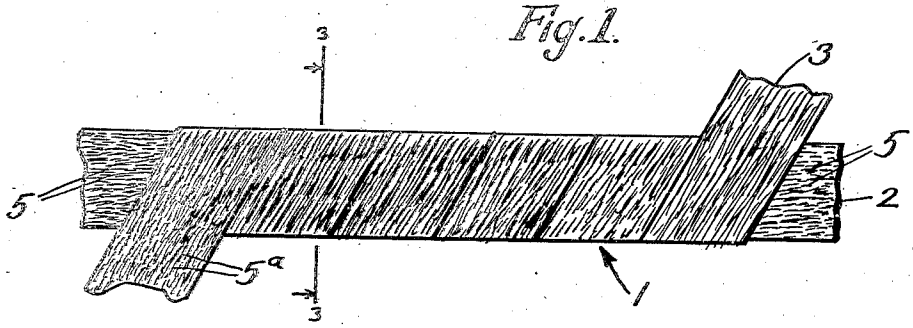


Fig. 2.

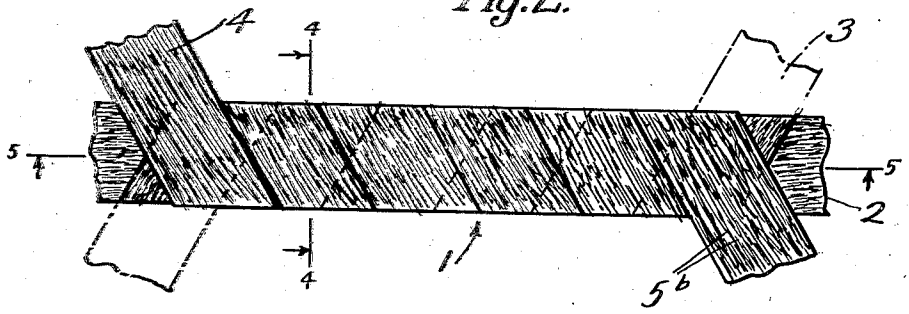


Fig. 3.



Fig. 4.

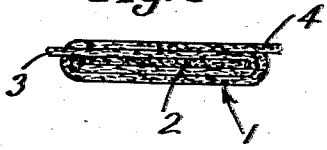
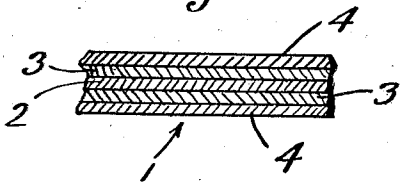


Fig. 5.



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By her Attorney

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UNITED STATES PATENT OFFICE.

NINA L. DURYEA, OF STOCKBRIDGE, MASSACHUSETTS.

ARTIFICIAL FABRIC.

Application filed September 30, 1921. Serial No. 504,469.

To all whom it may concern:

Be it known that I, NINA L. DURYEA, a citizen of the United States, residing at Stockbridge, in the county of Berkshire and State of Massachusetts, have invented new and useful Improvements in Artificial Fabrics, of which the following is a specification.

My invention relates to fabricated materials, having reference more particularly to fabrics in which the fibres are laid in relatively different directions.

The product forming the subject matter of my present invention may be produced by a process for which I have obtained Patent No. 1,505,546, dated August 19, 1924 which constitutes only one of the many ways in which the fibres of my improved fabric may be composed.

It is well known that the tearing strength of most cloths and fabrics is largely affected by the arrangement of the fibrous constituents thereof, of which it is an equally well recognized corollary that the tearing resistance of a given fibrous material is greater transversely to the predominating direction of its fibres than in a line parallel therewith.

In the prevailing practice relative to the formation of felts the cotton or wool fibres are assembled in the same general direction, and irrespective of the strength of its other constituents, portions of a felted fabric can be readily ripped or peeled off from the remaining portions of the material by following the direction of the fibres. On the other hand the same piece of felted material will develop an increased strength of resistance if the attempt be made to rip apart the portions in the direction substantially at right angles to that first described for the present comparison.

My improved material is characterized by a fibrous construction which forms a more homogeneous material by reason of the pre-arranged crossing and re-crossing of the fibres, which partakes in some degree of the efficiency of woven materials.

Generically considered, my improved fabric comprises a felted material in which the fibrous components are pre-arranged to run in strata, the fibres of one stratum running in a general direction different from those of other strata.

To consider my invention in its simplest form, it would have a thin fibrous layer having fibres all running substantially in a given direction, having interposed immediately upon its surface a similar layer with its fibres disposed at predetermined angles to those of the first mentioned layer.

The layers thus composed, when united with a suitable binding material, would form a strong, thin fabric that would resist a considerable tearing stress, and would have other useful qualities not possessed by an ordinary body of felt and be much less expensive to manufacture than if woven.

In its preferred form my improved fabric has a more diversified fibrous arrangement than last above described. I find that greater strength and durability results from having not less than three layers or strata of fibrous sheets in which the fibres of one sheet cut at less than a right angle intersection those of the immediately adjacent layer or layers.

Thus when three component sheets or layers are used, the fibres of each sheet are preferably laid at thirty degrees declivity to those of both other sheets, contributing more uniformity of resistance to tearing strains. When a greater number than three layers, obviously the angle of contact of the fibres of succeeding layers may be varied at pleasure, but preferably the crossing back and forth of the fibres should follow the general arrangement indicated above, namely, that each layer of fibres should cut those of adjacent layers at substantially the same angle.

In the accompanying drawings illustrative of a preferred embodiment of my invention,

Figure 1 is a partial plan view of a portion of a roll of material made up from two component strips or sheets;

Fig. 2 shows a similar roll composed of three distinct strips;

Figs. 3 and 4 are transverse sectional views on lines 3—3 and 4—4 of Figs. 1 and 2, respectively; and

Fig. 5 is a longitudinal section on line 5—5 of Fig. 2.

Referring to the drawings, the numeral 1 represents a roll of material made in accordance with my invention, comprising the three layers of strata 2, 3 and 4, each of which layers is composed of fibres which are the same in all the strata but for convenience of reference I shall distinguish by the characters 5, 5^a and 5^b respectively, the fibres 5 those running longitudinally, and the fibres 5^a and 5^b are contained in the re-

spective overlapping layers and run diagonally as shown.

In the drawings I have shown the fibres 5^a immediately adjacent both surfaces of the longitudinally disposed fibres, while the fibres 5^b are superimposed transversely upon the fibres 5^a and likewise are adjacent both of the sides thereof. That is to say, the fibres 5^a as shown in Fig. 1 cross the fibres 5 at substantially a declivity of 30 degreess relatively thereto throughout the entire length of the bolt of my material, but these fibres first cross in one general direction and are thus turned over the edge in my preferred structure and run in a reversed direction.

The fibres 5^b on the other hand, in the preferred form of my improvement, cross the fibres 5^a upon which they are immediately imposed and following the general arrangement of the fibres 5^a these fibres 5^b of the stratum 4 run thus diagonally upon the respective flat surfaces of the strata 3.

In the foregoing arrangement of the layers 2, 3 and 4 it has been seen that these constitute my preferred construction of the fabric of my present invention. Thus a selvedge is provided that increases the resistance efficiency of the material both against tearing and splitting and peeling of the layers.

Yet it is contemplated that the sheets of my material by reason of the running of the fibres in divergent directions possess the quality of tear resistance in practically all directions and throughout all portions thereof, irrespective of the selvedge construction and hence, while in certain respects and to a definite degree these layers may be composed with advantageous results following the arrangement hereinbefore described, this is not indispensable.

It will be obvious, therefore, that the general arrangement of the fibrous layers may be modified, and I accordingly point out, for example, the following manner wherein this feature of my improved fabric may be changed without departure from the essential features of my invention.

Thus, the fibres 5^a of the layer 3 may all be laid upon one side only of the layer 2, which for the convenience of description may be termed the basic layer. In applying the layer 3 it may be turned back upon itself along the edge of the basic stratum and its fibres made to cross at any desired angle the first laid fibres of this same layer.

Furthermore it will be apparent that the number of superimposed layers may be increased as desired, but it is deemed sufficient merely for the purpose of describing the essential properties of my improved fabric to show fibres running in not more than three different angular directions.

In whatever arrangements the fibrous layers may be disposed, the fibres of the several layers are impregnated with the usual binding and filling materials and are compressed into a single compact sheet of the required thickness, and upon either or both surfaces of the fabric thus formed may be added a surface of oil, rubber or other material in imitation of various materials such as leathers, cloths, papers, and similar fabrics.

Having described my invention, what I claim is:

A fabricated material comprising a plurality of layers, each of said layers having fibres disposed longitudinally therein, but one only of said layers having its fibres disposed longitudinally of said material, the other layers being superimposed thereon so that the fibres of each superimposed layer are angularly disposed to said first mentioned layer and overlap the outside edges thereof.

In testimony whereof I have hereunto set my hand.

NINA L. DURYEA.