

Jan. 27, 1942.

P. T. GATES
BELTING FOR USE AS PAPER FELT, INDUSTRIAL FELT, PULP FELT,
DRIER FELT, AND THE LIKE
Filed Jan. 10, 1939

2,271,295

Fig. 1.

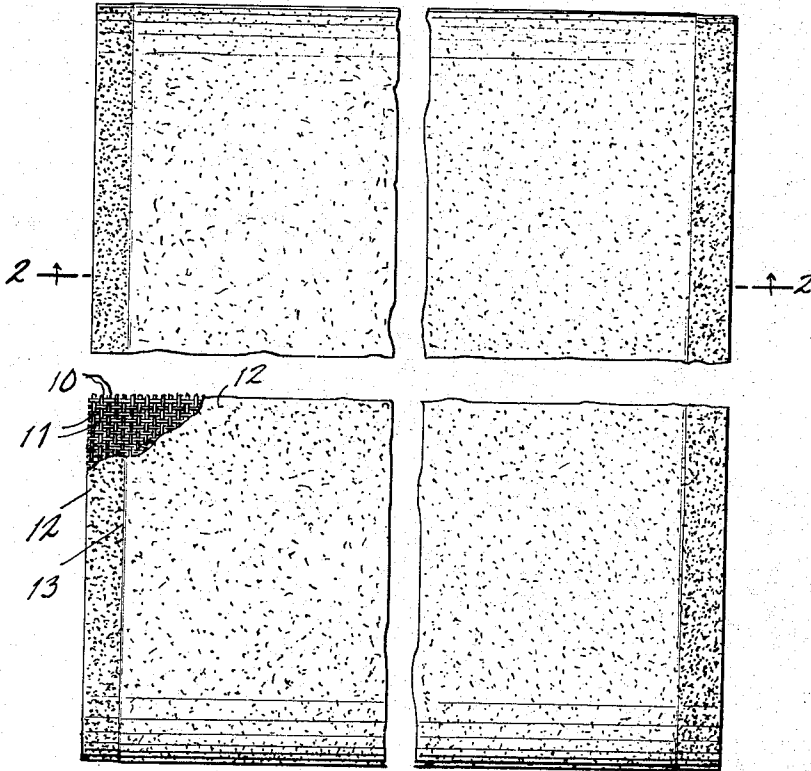


Fig. 2.

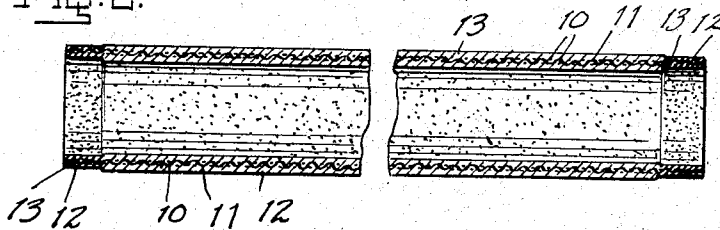
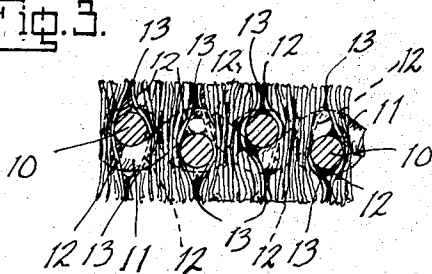


Fig. 3.



INVENTOR.
PERCIVAL T. GATES.
BY
Sam Watten
ATTORNEY.

UNITED STATES PATENT OFFICE

2,271,295

BELTING FOR USE AS PAPER FELT, INDUSTRIAL FELT, PULP FELT, DRIER FELT, AND THE LIKE

Percival T. Gates, Montclair, N. J., assignor to Drycor Felt Company, Belleville, N. J., a corporation of New Jersey

Application January 10, 1939, Serial No. 250,193

2 Claims. (Cl. 28—1)

The present invention relates to an improvement in belting for use as paper felt, industrial felt, pulp felt, drier felt and the like, and particularly belting formed of composite fabric material of the type produced according to the method disclosed in the patent to Patrick H. Walsh, for Method of and apparatus for making composite fabric, No. 1,620,307, granted March 8, 1937. The fabric produced according to this method consists of a base of open mesh coarsely woven material preferably consisting of cotton warp and weft, and in which base there are incorporated wool fibres which are needled into the base from a fleece bat by means of reciprocating needles which penetrate the base perpendicularly, the wool fibres being punched into the interstices of the base, so that such fibres have one end at the upper side and one end at the lower side of the base to provide napped surfaces.

According to this method the base fabric, in the form of an endless belt, is repeatedly moved through the needling machine while a web of fleece is simultaneously needled into it, the needled in fibres of the fleece gradually building up, so that in the finished material the base fabric is completely covered by the wool fibres. This material has the appearance and consistency of heavy felt, although the penetrating arrangement of the wool fibres in the woven cotton base is an entirely different structure from felt wherein wool or fur fibres are matted and interlaced with each other to produce the complete fabric, there being no woven base. This material is also entirely different from flannel or similar woven material which is woven from wool threads, the napped surfaces of the material being the fibres of the woven threads themselves, produced by fulling and brushing processes.

It is proposed in the present invention to provide a belt of this particular type of needled composite fabric having a selvage along each side produced by impregnating the marginal edge portions with an adhesive for the purpose of preventing narrowing up of the belting through ravelling of the edge threads, increasing the resistance of the edges to abrasive wear, and forming a binding at the edges which will not increase bulk, so that in the use of the belt in machines there will be an even pressure across the belt as it passes between rolls. It is further proposed to provide a selvage which shrinks the belt slightly at the edges thereby reducing the dif-

ficulty often encountered in belts due to slack edges.

In combining the adhesive with the particular type of needled composite fabric contemplated herein, the perpendicularly arranged penetrating wool fibres will be caused to adhere to each other and to the woven base, and due to the fact that these fibres extend at their ends above and below the base fabric certain of them will form encircling ties about the crossings of the warp and weft threads of the base fabric, with the result that the warp and weft will be held together firmly at the crossings.

It is proposed to provide such adhesive preferably in the form of rubber products or derivatives such as latex, vultex, or the like, which in addition to their cementing characteristics also have elasticity, will resist abrasion, and will stand up under the severe conditions under which the belt is used. For instance in paper mills such material will be resistant to the alkaline action of some types of paper stock, such as sulphate or sulphite pulp.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a plan view of a belt according to the invention, partially broken away.

Fig. 2 is a transverse sectional view, along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged diagrammatical transverse sectional view of a portion of the selvage.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing the belt according to the invention comprises a woven base consisting of warp threads or cords 10 and weft threads or cords 11, these being preferably coarse cotton threads or cords and loosely woven to provide an open mesh. Wool fibres 12 are needled into this base so that they penetrate the mesh openings perpendicularly and produce a nap at the upper and lower surfaces, the ends of the penetrating wool fibres projecting above and below the woven base and being sufficiently thick so that a continuous napped surface is produced which completely covers the woven base.

The belt material is cut to produce the necessary width desired for the particular belt and thereupon selvages are provided along the side

edges by impregnating the marginal portions with a suitable adhesive 13, preferably a rubber derivative such as latex, vultex, or the like, this adhesive being applied in solution and then allowed to dry.

Due to the particular perpendicular arrangement of the wool fibres in the mesh openings of the woven base, with the ends of the fibres projecting above and below the base, the adhesive causes these fibres to become bound together in such manner that they form encircling ties about the crossings of the warp and weft threads, the ends of certain of the fibres which extend about one side of the crossing being adhesively connected to the ends of certain other fibres which extend about the other side of the crossings, these fibres being also connected to adjacent fibres and to the warp and weft threads themselves. As a result the warp threads are firmly locked to the weft threads at the edges so that they will be effectually held against ravelling. Fig. 3 illustrates diagrammatically the arrangement of the adhesively connected wool fibres forming encircling ties about the warp and weft crossings. This interlocking by means of the punched in wool fibres is unique in its structure and functioning, as compared for instance with the treatment of a piece of woven fabric with latex or other adhesive and dependence alone on the adhesion of the crossings of the warp and weft threads to bind them together. Preferably the impregnation extends back for a number of warp threads.

The selvage produced in this manner has other resultant advantages and purposes in the belt structure than that of preventing unravelling of the edge warp threads. As seen in the sectional view, Fig. 2, the impregnated selvages are of greater density than the remainder of the belt, and are more compact, with the result that the edges of the belt is free of any increased bulk, such as occurs when a binding is placed about the edge of the belt, and therefore the belt will engage over the rolls or cylinders which support it, or move between rolls, with an even pressure across the belt. A further advantage lies in the fact that the wool nap impregnated with adhesive is less susceptible to abrasion, so that in use in machines where the guiding of the belt depends upon pressure on the selvage there is better cooperation with the guiding apparatus, with less wear, and with even pressure across the belt. The impregnation of the marginal edge portions of the belt also causes these portions to shrink slightly with respect to the rest of the belt, although having slight elasticity, so that in use on the paper machine there will be no tendency for the edge to become slack due to stretching. This has been a particular problem in felts where the selvages

were subjected to pressures and stresses which caused the edge portions of the felt to stretch, thereby producing a wrinkling effect which in some cases was greater at one edge than at the other, thereby resulting in uneven feeding, creeping, etc. The tying in of the crossings at the selvage by the adhesively connected wool fibres also greatly reduces the sleaziness along the marginal portions, and therefore maintains the whole belt structure against excessive sleaziness.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appending claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. As a new article of manufacture, a paper maker's felt for supporting and draining paper making material, comprising a woven base having warp and weft threads and nap producing fibres penetrating said base through the interstices between said warp and weft threads and projecting at the top and bottom, and an adhesive substance impregnated in the marginal portions of said material contiguous to its longitudinal edges to form a binder between the fibres and the woven base and interlocking the warp and weft threads of the woven base at the edges to render said marginal portions resistant to sleaziness and abrasion, said marginal portions being of greater density and relatively thinner than the remainder of the material whereby in passing between rollers said edges allow clearance to produce an even pressure across the felt upon the paper material supporting surface.

2. As a new article of manufacture, a paper maker's felt for supporting and draining paper making material, comprising a woven base having warp and weft threads and nap producing fibres penetrating said base through the interstices between said warp and weft threads and projecting at the top and bottom, and an elastic adhesive substance impregnated in the marginal portions of said material contiguous to its longitudinal edges to form a binder between the fibres and the woven base interlocking the warp and weft threads of the woven base at the edges to render said marginal portions resistant to sleaziness and abrasion, said marginal portions being shrunk longitudinally relatively to the remainder of the material and having longitudinal elasticity whereby slack in the edges is reduced to maintain the paper material supporting surface between said edges in a uniformly flat-non-wrinkled state.

PERCIVAL T. GATES.