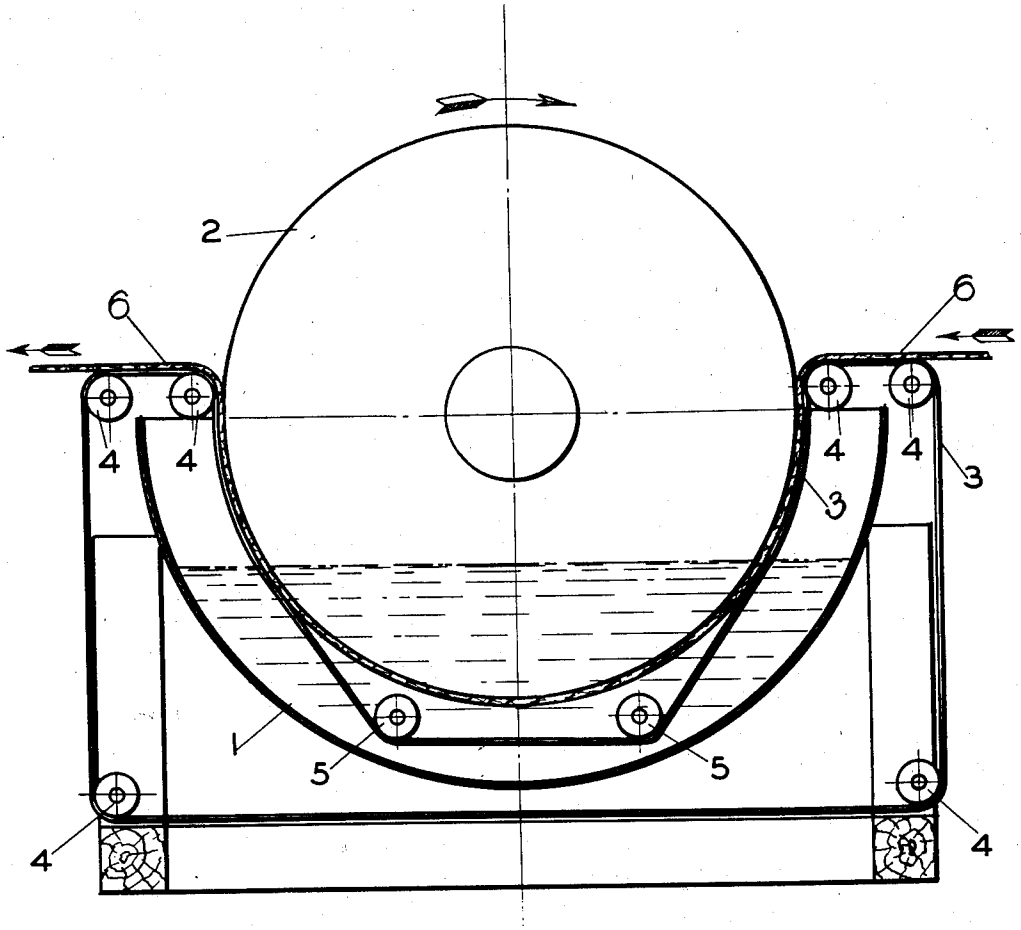
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METHOD OF AND APPARATUS FOR IMPREGNATING AND/OR SURFACE COATING FABRICS

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INVENTOR.
CARLTON W. CRUMB
FRANK M. SANDERS
BY.
ATTORNEYS.

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METHOD OF AND APPARATUS FOR IMPREGNATING AND/OR SURFACE COATING FABRICS

Carlton W. Crumb, Hazleton, Pa., and Frank M. Sanders, Marysville, Mich.; said Crumb assignor to Oliver United Filters Inc., San Francisco, Calif., a corporation of Nevada; said Sanders assignor to St. Clair Rubber Company, Marysville, Mich., a corporation of Michigan

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9 Claims. (Cl. 91—68)

This invention relates to the manufacture of impregnated and/or surface-coated fabrics such as building and roofing papers, artificial leathers, and automobile top material.

In all manufacturing operations carried out on a commercial basis due consideration must be given to the quality of the final product taken in connection with the cost of manufacturing and therefore any method or equipment by which a better product can be produced at a lower cost is highly desirable.

It is preferable that the products above enumerated and particularly automobile top covering, be possessed of a relatively high tensile strength and at the same time be uniformly coated or treated.

In the conventional method of making artificial leather and automobile top materials, a length of ordinary woven cotton muslin is run over spreader machines and a very thin coating of rubber compound is applied. This process is repeated three or four times until the desired thickness of material is secured.

The material is then run through calendar rolls and a design or grain is pressed into the coating and although a reasonable tensile strength is secured by this method, a higher tensile strength would greatly increase their market value. The only apparent method of obtaining a product of greater tensile strength is by using a stronger grade of woven fabric or by increasing the thickness of the rubber compound used on the spreaders. Both of these methods involve a cost that defeats the original purpose.

After some rather extended experiments in an effort to increase the tensile strength of this product without materially increasing its cost of manufacture we have found that by impregnating ordinary cotton batting with a diluted suspension of rubber in water, and in then drying it, a thin sheet of fibrous material can be secured which when coated in the usual way by spreaders has a tensile strength nearly double that of the usual material and due to the difference in cost of the cotton batting and the cotton muslin usually used is somewhat cheaper to manufacture.

Cotton batting, however, due to its unwoven and unfelted condition is easily torn and pulled out of shape and therefore special methods and apparatus are required for impregnating or surface-coating it.

In general then, the object of this invention is the provision of a method and apparatus whereby ordinary cotton batting may be uniformly impregnated or surface-coated without being torn or pulled out of shape.

More specifically the object of this invention is the provision of an apparatus for surface-coating or impregnating fabrics comprising a rotary drum filter and an endless, smooth surfaced apron having an interrupted contact with the lower portion of the filter drum.

Another object of the invention is the provision of a method for impregnating a sheet of material comprising passing said sheet, while supported between two endless supporting surfaces, through a bath of the impregnating material; disengaging one of said supporting surfaces during a portion of its travel through the impregnating material to expose one side of said sheet and simultaneously coating the exposed surface of the sheet.

The invention possesses other advantageous features some of which with the foregoing will be set forth at length in the following description where we shall outline in full that form of our invention which we have selected for illustration in the drawing accompanying and forming part of the present specification. In said drawing, we have shown one form of our invention, but it is to be understood that we do not limit ourselves to such form since the invention as set forth in the claims may be embodied in a plurality of forms.

In the drawing the single figure is a diagrammatic representation of a rotary drum vacuum filter in which the objects of our invention are embodied.

Since the filter used may be of any well known type such as for example like that shown and described in the old British patent to Hart No. 3,734 of 1872, or like that more recently shown and described in the patent to Oliver No. 919,628 of April 27, 1909, it is thought unnecessary to give a detailed description of it.

In general it may be said to comprise a vat or tank 1 adapted to accommodate a plural or multiple compartment drum 2, the compartments of which are adapted to be successively subjected to a usual cycle of operation including cake-formation, washing, drying and discharge. An endless impervious smooth-surfaced belt or apron 3 passing around suitably disposed idlers 4 is made to have an interrupted contact with the lower periphery of the drum 2 and this interrupted contact may be secured by causing the apron 3 to be led away from the drum 3 for a portion of its travel by means of idlers 5. Needless to say the peripheral or angular distance

over which the apron 3 is out of contact with the drum 2 may be controlled by spacing the idlers 5 as desired. The apron 3 is preferably smooth surfaced for reasons which will appear hereinafter.

In operation the tank 1 is fed with a liquid suspension of the coating material such as for example rubber, and the cotton batting to be treated is fed in a continuous sheet 6 between the drum 2 and the apron 3 and is thereby made to travel through the liquid suspensions. As shown the cotton batting is in contact with the drum throughout its entire travel through the tank and is subjected to the action of the suspension only over that portion of its surface where the apron 3 has been separated from it by the idlers 5. At this point the corresponding drum compartment is placed under the influence of a vacuum to thereby cause the solids in suspension to impregnate the batting or to be deposited as a layer or coating thereon. As the drum continues to rotate the surface coated cotton batting is contacted and supported by the endless apron. This is quite essential for if the batting is not supported as it leaves submergence, the flow back of solution from the corresponding filter compartment flushes the batting from the drum surface and tears it into several short lengths. As already stated the apron is preferably smooth surfaced for a reticulated apron of wire or cord leaves imprints in the batting which when dried form shallow valleys that have to be filled with rubber in the spreader, thereby necessitating the use of more rubber than would be necessary if a smooth surfaced apron had been used. For this purpose a smooth surfaced non-porous pyroxlin coated canvas belt has been developed.

A product of greater tensile strength can be obtained by the use of the invention above described because of the fact that due to the unwoven and unfelted character of the cotton batting used, each individual fiber of the batting can be impregnated or surface-coated (a result that can not be obtained when a woven or felted material is used) and at the same time the use of cotton batting enables a considerable saving to be effected. Furthermore, the use of a smooth surfaced supporting apron having an interrupted contact with the supporting drum has the additional advantage that irrespective of whether a woven material or cotton batting is used, the treated material is not impressed with valleys which have to be filled in by subsequent treatment.

We claim

1. The method of impregnating and/or surface coating a sheet of material of low tensile strength comprising passing said sheet while supported between two endless supporting surfaces, thru the treating material; disengaging one of said supporting surfaces during a portion of its travel thru the treating material to expose one side of said sheet and filtering said treating material thru the exposed surface of said sheet.

2. The method of surface coating a sheet of material comprising passing said sheet while supported between two endless supporting surfaces, thru a liquid suspension of the coating material; disengaging one of said supporting surfaces during a portion of its travel thru the suspension to expose one side of said sheet, and filtering said suspension thru the exposed surface of the sheet.

3. The method of impregnating a sheet of material comprising passing said sheet while supported between two endless supporting surfaces, thru a bath of the impregnating material; disengaging one of said supporting surfaces during a portion of its travel thru the impregnating material to expose one side of said sheet and passing said impregnating material thru the exposed surface of the sheet.

4. The method of surface coating a sheet of material of low tensile strength comprising passing said material thru a liquid suspension of the coating material while supported between two endless surfaces, disengaging one of said supporting surfaces during a portion of its travel thru said suspension and filtering said suspension thru the exposed surface of said sheet.

5. An apparatus for surface coating and/or impregnating fabrics comprising a rotary drum filter and an endless apron having an interrupted contact with the lower portion of the filter drum.

6. An apparatus for surface coating and/or impregnating fabrics comprising a rotary drum filter and an endless smooth surfaced apron having an interrupted contact with the lower portion of the filter drum.

7. An apparatus for surface coating and/or impregnating fabrics comprising a rotary drum filter and an endless impervious apron having an interrupted contact with the lower portion of the drum.

8. An apparatus for surface coating and/or impregnating fabrics comprising a tank, a drum rotatably mounted within said tank and an endless apron having an interrupted contact with the lower portion of said drum.

9. An apparatus for surface coating and/or impregnating fabrics comprising a tank, a drum rotatably mounted within said tank and a smooth surfaced endless apron having an interrupted contact with the lower portion of said drum.

CARLTON W. CRUMB.
FRANK M. SANDERS.