Patented June 21, 1938 2,121,709

UNITED STATES PATENT OFFICE

2,121,709

LEATHER-LIKE MATERIAL AND PROCESS OF PRODUCING SAME

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No Drawing. Application March 12, 1936, Serial No. 68,574

1 Claim. (Cl. 91—68)

This invention relates to leather-like material and process of making the same. More particularly, it relates to the production of a leather-like material which can be made by treating a fabric base with compositions of rubber or rubber-like materials in such a manner that a material having the appearance, stiffness and other characteristics of leather is produced.

Various processes have been devised for the manufacture of artificial leather in which a woven or unwoven fabric is impregnated or coated with a cementitious or adhesive material. The use of cements for this purpose requires special and costly methods of treatment for the impregnation and compacting of the fibrous material in order to obtain the necessary tensile strength and stiffness in the finished product. It was also found to be costly to impart a leather-like appearance to the material when the prior art methods were used. Liquid rubber latex was also used to impregnate woven and unwoven materials, such as cotton felt. This was not entirely satisfactory because it caused excessive shrinkage of the felt and consequent difficulties in handling the material on the machines. Therefore, it is desirable to provide for improved, less costly and more convenient methods of production, and for avoiding the described defects and other difficulties.

One of the objects of the invention is therefore the production of a latex-containing leather-like material.

Another object of the invention is the production of a leather-like material having the appearance and stiffness of leather and which also resembles leather in that it is non-fraying and can be skived like leather.

The invention has as a further object the impregnation and processing of unwoven textile fabrics or felts, and preferably a cotton felt, with compositions containing rubber in such a manner that the resulting product has the characteristic properties of leather and particularly the stiffness and surface appearance of leather.

The objects of the invention are attained generally by treating the fabric felt, pad or matt from one side with rubber cement so as to impregnate the material to a portion of its thickness. The material is then treated to impregnate the non-cemented portion with liquid latex. The treatment with rubber cement decreases the tendency to shrink when the latex is applied, reduces the quantity of latex required, serves as an aid in imparting leather-like appearance to the product, and gives satisfactory stiffness and strength.

The invention will now be more fully described with reference to a specific embodiment thereof, but it is to be understood that the invention is not limited thereto.

A cotton felt 72 inches wide and weighing about 16 ounces to the yard designated as 16 ounce 72", is placed in roll lengths on an impregnating machine and is passed between two rolls which squeeze into one side of the felt a gasoline type curing cement of the following composition;

	Pounds	Ounces
Pale crepe	19	0
20% sulphur master batch	2	0
Montan wax	4	0
Trimene base	--	8
Zinc oxide	5	0
Blanc fixé	20	0
Albasan	--	4

The above ingredients are dissolved in gasoline and thinned to the required viscosity so as to regulate the depth of the impregnation, depending upon the desired stiffness and consolidation of the fibers required. For greater stiffness and deeper impregnation other viscosities may be used. The felt base is impregnated to about half its thickness, say about 0.02 of an inch deep with about 4 oz. (dry weight) of cement per square yard and is then passed over suitable drying coils to remove the solvent from the cement. The roll of fabric thus partially impregnated from one side is then placed on the same impregnating machine and impregnated from the opposite side with about 8 oz. (dry weight) per square yard of latex or similar water dispersed cementitious latex-containing material which may or may not contain coloring materials. The impregnated material is loosely wound directly after it is passed through the impregnating rolls in order to slowly dry the material, accomplish complete saturation of the fibers, and to eliminate excessive tension on the material, such as the action which would result if the material were drawn directly over the drying coils after being impregnated. Such excessive tension would tend to cause undue stretching and would prevent the complete saturation of the fiber with latex which is accomplished in the time required for winding and under the conditions of lack of tension which are present in the wound piece. The impregnated material is then passed about three or four times, over drying coils without tension to remove moisture and is then taken to a suitable consolidating

machine, such as a calender or doubling machine, and passed between squeeze rolls to consolidate it and to obtain a uniform gauge. The consolidated material is placed on a suitable rubber spreader and the face, or cement impregnated side is spread with a gasoline type curing cement similar to that referred to above for impregnating purposes but containing suitable coloring matter, if desired. This spread coat is reduced to the proper thinness with gasoline and applied in such a manner that the fibrous appearance of the impregnated material will be preserved, and not so dense or thick that the surface will have the appearance of being smooth or composed of rubber. Two spread coats, each of about 2 oz. (dry weight) of cement per square yard of material, generally produce the desired appearance of fibrous material and a sufficient amount of surface material so that the surface can be readily embossed, but more or less can be used. The coated material is dried and embossed with a suitable grain to simulate leather and further to consolidate the fibers. The material is then passed through the curing chamber and vulcanized with heat for about 1½ hours at 250° F. although these conditions will vary somewhat in accordance with the accelerator employed in the rubber.

If a drier surface than that which is obtained by a dry heat cure is desired, the embossed side may be treated with a solution of sulphur chloride or bromine and finally neutralized in the manner well known in the art, such as by the application of ammonia vapor.

Many modifications of the above embodiment of the invention may be made. Either a heat-curing or a cold-curing cement can be used. However, a heat-curing gasoline dispersed rubber cement is fully adequate for most purposes since it gives a drier, more leather-like surface and greater stiffness to the product. I desire to use a relatively highly concentrated dispersion of latex, such as that which is known under the trade name "Revertex" and contains about 63 grams of solids per 100 c. c., but more or less concentrated aqueous latex dispersions can be used. Aqueous latex acts to consolidate, stiffen and toughen the material, and it gives the material greater resistance to fraying than do the organic solvent—dispersed rubber compositions. More or less curing agent can be used in conjunction with the latex if more or less stiffness is desired, or for the more flexible products, no curing agent is incorporated. The latex dispersion may be used with or without fillers. A desirable water dispersed composition which produces a distensible leather having excellent properties contains latex with about 2.5 parts of zinc oxide, 0.5 part of sulphur, 1.0 part of butyl zimate and 2.0 parts of coloring matter in 100 parts. This composition desirably contains small amounts of a stabilizer such as caustic soda, a protective colloid such as casein solution, and a thickener such as gum tragacanth or starch.

Other methods than those enumerated in the example for thoroughly and completely impregnating the fibers with latex and drying with little or no tension may be used. A time element for saturation before drying and lack of tension are desirable, such as that which is obtained by winding the material into a roll as described but other means of obtaining these operating conditions can be used. For example, it would be sufficient if substantially the same conditions were duplicated by the use of a tenter frame.

The base material can be variously modified from absorbent felts or pads to absorbent woven material or materials composed partly of woven and partly of unwoven material. Likewise many kinds of fibers can be employed and other modifications can be made in the quantity of impregnating material and coating material used to suit the texture and fiber of the base material and to modify the properties of the product.

Materials prepared in accordance with this invention closely resemble leather in stiffness and appearance and are therefore particularly adapted for use as cuffs for gauntlets and as luggage materials. They can, however, also be used for other purposes such as soling for shoes and quarter-lining materials.

Since many modifications of the invention may be made and some are suggested by the foregoing description of the invention, it is to be understood that the invention is not limited to the particular embodiments herein described, and that no limitations are intended in the claim except those which are specifically recited or imposed by the prior art.

I claim:

A process for the production of leather-like materials which comprises impregnating an absorbent sheet of felted textile fabric from but one of its surfaces to a portion only of its thickness with a cement comprising a solution of rubber in organic solvent of such viscosity to limit its impregnation to a portion only of the thickness of the fabric, drying the cement, then impregnating from the un-impregnated surface the remaining portion of the sheet with rubber latex, drying the impregnated fabric while maintaining it free from tension until substantially complete saturation of the fibers with the latex, consolidating the impregnated fabric through squeeze rolls, and coating with rubber that surface only of the impregnated fabric to which said solution of rubber was applied by spreading rubber cement over said surface to a thickness which permits embossing but which retains the fibrous appearance of the surface.

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