Patented Apr. 6, 1937

2,075,967

UNITED STATES PATENT OFFICE

2,075,967

SHEET MATERIAL

Morgan J. Vittengl, Fairfield, Conn., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

No Drawing. Application March 1, 1934, Serial No. 713,519

6 Claims. (Cl. 91—68)

This invention relates to a fibrous sheet material which simulates natural chamois in its essential characteristics.

Sheet materials have been produced to simulate natural chamois but these have not been entirely satisfactory in that they lack some of the desirable characteristics of the natural material. While these materials possess much of the soft "feel", pliability and fibrous appearance of natural chamois, properties which are highly desirable, they still possess a certain water repellency which persists to some extent even after thoroughly washing with water and drying. Another objection to materials of this type is that they rapidly loose their pliability and soft feel. In order to overcome this objection oils which acted as softening agents were used in the impregnating medium. While the oil decreased the tendency of the sheet material to lose its soft feel and pliability it introduced the objectionable feature of lack of water absorption or water repellency. Such a result would be expected from the use of oils since they are naturally water repellent substances. While the lack of water absorbency is not objectionable when the material is used for some purposes, the property is objectionable when the material is to be used in the cleaning art where chamois finds its principal use. This property of water repellency has hindered the full and free exploitation of the sheet materials heretofore produced as substitutes for the natural product.

This invention has as an object the provision of a sheet material which simulates natural chamois in its principal properties of appearance, feel and water absorbency. A further object is the provision of a sheet material as a general substitute for natural chamois which will retain to a great extent its original soft "feel" and pliability. A still further object is to provide a sheet material which is particularly useful for cleaning purposes, either with or without the aid of water.

These objects are accomplished by the following invention in accordance with which a suitable base fabric is impregnated with a rubber compound containing hygroscopic agents. If desired a vulcanization treatment for the rubber compound may be applied.

This invention comprises impregnating a napped woven fabric base with a thin dispersion of an especially prepared rubber compound in gasoline which constitutes a more or less thin cement. The impregnation with the especially compounded cement is carried out by passing the napped fabric through the cement and then through squeeze rolls. The partially impregnated fabric is then dried by any suitable means well known to those versed in the art and the impregnation repeated until the desired amount of the special rubber compound has been deposited in the fabric. After the impregnation has been completed and the impregnated fabric has been finally dried it is dusted with talc on both sides in the manner well known in the art. The talc dusted sheet is then vulcanized if desired by means of sulfur chloride in a closed chamber according to the conventional procedure. After the vulcanization has been completed, the impregnated sheet is aerated in the usual manner and then subjected to an atmosphere of ammonia gas in order to neutralize any excess sulfur chloride which may have remained unused in the fabric. This neutralization operation completes the production of the material.

The rubber compound used for impregnating the fabric is prepared by milling pale crepe gum rubber on standard roller mills or by any other suitable means known in the art and adding the softeners, fillers and hygroscopic agent and mixing the ingredients until a homogeneous mass results. This compound is dispersed in a sufficient quantity of suitable dispersing medium such as gasoline to yield a thin dispersion or cement. The viscosity of the cement may vary between wide limits although this property will depend somewhat on the fabric used as will be evident hereinafter. A suitable dispersion for a napped sheeting type fabric has been found to result from the use of 125 pounds of rubber compound dispersed in 49 gallons of gasoline. Such a dispersion has the proper viscosity for the particular fabric to be impregnated.

As an example of a suitable rubber compound for impregnating the fabric the following is noted:

	Pounds
Raw pale crepe rubber	40
White factice	10
Glycerine	10
Pigments	31
Fillers	33
	124

This example is merely illustrative and is not given by way of limitation. Wide variations in the ingredients are permissible and such will be readily evident to those skilled in the art of rubber compounding.

The scope of the invention is not limited to the

use of cotton fabrics or to any particular construction of cotton fabric. While the regular sheeting weave has been found suitable other weave fabrics such as twills may be used without departing from the spirit of the invention. Any weight sheeting such as those known in the textile trade as 3.00, 2.50, 2.00, 1.70, 1.60 36-inch width, etc. can be used satisfactorily. By way of explanation of these designations it may be noted that for example a 3.00 sheeting is one in which there are 3 yards to a pound of the material or one square yard weighs approximately 5.33 ounces. Similarly, a 2.00 contains 2 yards to a pound or weighs 8 ounces per square yard. A 1.60 weighs 10 ounces per square yard. Non-woven fibrous bases such as felted cotton, wool or wood fiber sheets may be used in place of the woven fabrics.

For the best results the fabric should be napped but the invention is not limited by the degree of napping. Any degree of napping will be satisfactory although a heavy napping is desirable to obtain a fibrous appearance and to avoid a so-called clothy appearance, i. e., one where the weave of the fabric is evident in the finished product. The choice of fabric and degree of napping will depend on the desired weight of the finished material desired, the degree of plumpness as the desired feel and will be understood by those skilled in the art.

Although glycerol is mentioned in the example as the hygroscopic agent contained in the rubber compound, the invention is not limited to this particular material. Any material which has hygroscopic or deliquescent properties and will mix with the rubber without detrimentally affecting the rubber may be used. As examples of materials instead of glycerol mention is made of sodium lactate, ammonium acetate, zinc acetate, sodium acetate, glycol, diethylene glycol, triethylene glycol, propylene glycol, etc.

As dispersing media for the rubber compound benzol, toluol, solvent naphtha, mineral spirits and similar materials may be used equally as well as gasoline.

The use of squeeze rolls for impregnating the fabric with the special rubber compound in the example cited is not intended to limit the invention to this means of impregnation. Other means of impregnation will be readily evident to those skilled in the art.

While it is not intended to limit the scope of the invention, by any expressed theory, it is my present belief that the incorporation of the hygroscopic or deliquescent materials into the rubber compound and the subsequent dispersion throughout the rubberized fabric promotes a greater affinity for water and imparts a greater degree of wetability and water absorbency to the material.

The principal use of the product of the invention is for cleaning purposes where the material is used to absorb excess water or to remove dirt from all types of surfaces and materials. The sheet material is also useful for cleaning without the use of water, by direct absorption of the dirt from the article to be cleaned. The material also serves as an excellent polishing cloth for various surfaces such as glass, metal, polished wood, etc. A further use is for garments of the sport type such as wind-breakers, jackets, etc., which are now made of natural chamois leather.

This invention provides an improved artificial material having the appearance of chamois and excellent water absorbency unlike artificial chamois of the prior art and similar to natural chamois leather. Water absorption is an essential property when the material is to be used for cleaning purposes. Tests carried out on material containing the hygroscopic agent showed that only a single dip in water was required to wet the surface. Material containing no hygroscopic agent required ten dips to wet the surface. The wet sheet of the latter material after wringing absorbs water very poorly whereas the material which was made in accordance with the invention absorbed water quite readily. Porosity tests definitely show the superiority of the material of the invention in that water passes through and dampens the opposite side of the material in approximately 12 minutes when the material is laid on a smooth plane surface, whereas material which does not contain the hygroscopic agent shows no dampness under the same conditions after five hours contact with water. The excellent porosity of the material presents a decided improvement over the material heretofore available for sport garments.

A further advantage of the product of the invention is the property of retaining its softness and pliability after having been used in actual service. Its serviceability in this respect is increased at least three fold as compared with present products.

As many apparent and widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. The process of preparing artificial chamois material which comprises impregnating a napped woven cotton fabric base with a rubber dispersion containing in proportion 40 lbs. of raw pale crepe rubber, 10 lbs. of white factice, 10 lbs. of glycerine, 31 lbs. of pigment, and 33 lbs. of filler, said compound being dispersed in 49 gals. of gasoline passing the fabric through squeeze rolls, repeating the impregnating and squeezing until the desired amount of rubber compound has been deposited in the fabric, drying, dusting both sides of the fabric with talc, vulcanizing by means of sulfur chloride and then subjecting the treated fabric to an atmosphere of ammonia.

2. The process of preparing artificial chamois material which comprises impregnating a napped woven cotton fabric base with a thin rubber dispersion containing rubber and glycerine, the amount of glycerine being equal to 25 per cent of the amount of rubber by weight, squeezing the impregnated fabric to remove excess cement, repeating the impregnation and squeezing until the desired amount of rubber compound has been deposited in the fabric and vulcanizing whereby a sheet material resembling chamois in appearance and water absorbency is obtained.

3. The process of preparing artificial chamois material which comprises impregnating a napped woven cotton fabric base with a thin rubber dispersion containing rubber, factice and glycerine, the amount of factice being equal to 25 per cent, and the amount of glycerine being equal to 25 per cent of the amount of rubber by weight, squeezing the impregnated fabric to remove excess cement, repeating the impregnation and squeezing until the desired amount of rubber compound has been deposited in the fabric and vulcanizing whereby a sheet material resembling chamois in appearance and water absorbency is obtained.

4. The process of preparing artificial chamois material which comprises impregnating a napped woven cotton fabric base with a thin rubber dispersion containing rubber, factice and a hygroscopic agent, the amount of the factice being equal to 25 per cent of the amount of rubber by weight, squeezing the impregnated fabric to remove excess cement, repeating the impregnation and squeezing until the desired amount of rubber compound has been deposited in the fabric and vulcanizing whereby a sheet material resembling chamois in appearance and water absorbency is obtained.

5. The process of preparing artificial chamois material which comprises impregnating a napped woven cotton fabric base with a thin rubber dispersion containing rubber factice and a hygroscopic agent, said hygroscopic agent being a member of a group consisting of glycerol; ethylene, diethylene, triethylene and propylene glycols; acetates and lactates of the alkali metals, ammonium and zinc, the amount of the factice being equal to 25 per cent of the amount of rubber by weight, squeezing the impregnated fabric to remove excess cement, repeating the impregnation and squeezing until the desired amount of rubber compound has been deposited in the fabric and vulcanizing whereby a sheet material resembling chamois in appearance and water absorbency is obtained.

6. Artificial chamois material substantially as made by the process of claim 4.

MORGAN J. VITTENGL.