United States Patent

[11] 3,616,146

[72] Inventor **Jean A. Gabet**
Croix, France

[21] Appl. No. **686,098**
[22] Filed **Nov. 28, 1967**
[45] Patented **Oct. 26, 1971**

[73] Assignee **Societe Anonyme Dite: Etablissements Randon & Immain**
Hem (Nord), France

[32] Priority **Dec. 7, 1966**
[33] **France**
[31] **PV 86,559**

---

[54] **PREGLUED WALL TEXTILES**
12 Claims, 1 Drawing Fig.

[52] **U.S. Cl.** **161/88,** 117/76, 117/83, 117/122, 156/88, 161/89, 161/92, 161/167
[51] **Int. Cl.** **C09j 7/04**
[50] **Field of Search** 117/68, 68.5, 122, 135.5, 76, 80, 83, 86, 90, 140; 161/88, 89, 92, 167, 406, 151; 156/88

[56] **References Cited**

UNITED STATES PATENTS

1,276,731	8/1918	Crowell	117/122 X
1,322,786	11/1919	Haon	117/122 UX
2,038,325	4/1936	Van Cleef	117/68.5 X
2,208,619	7/1940	Armor et al.	117/68.5 UX
2,295,613	9/1942	Stillwell	117/122 X
2,300,224	10/1942	Humphner	117/122 X
3,275,469	9/1966	Streit	161/406 X

FOREIGN PATENTS

860,343	2/1961	Great Britain	117/68.5

Primary Examiner—William A. Powell
Attorney—Ernest G. Montague

ABSTRACT: An adhesive sheet material comprising a dimensionally stabilized and water-resistant fibrous carrier, the back of which carries a continuous impermeable film adhering intimately to the carrier yet preserving its suppleness and conferring on it resistance to stretching and preventing it from fraying, a layer of dry adhesive on this film which is compatible therewith and adherent thereto to protect its suppleness against aging, insensitive to moisture, heat and cold, and adapted to be activated by a liquid medium prior to use.

PATENTED OCT 26 1971

3,616,146

INVENTOR.
Jean Aniset Gabet
BY Bruce & Montague
Attorney

PREGLUED WALL TEXTILES

The present invention relates to a flexible fibrous sheet product having a layer capable of acting as an adhesive when treated with a liquid. Such products are suitable in particular as furnishing fabrics or for decorative or other purposes. This product will be referred to generally as adhesive sheet material. The invention relates also to a process for the manufacture of this product.

Self-adhesive materials have been proposed on many occasions for use on walls. These materials are obtained generally by the application of an adhesive to one surface, the adhesive being protected by a special paper which is generally treated with a silicone and must be peeled off prior to use. These materials which are intended to be used like self-adhesive papers or pressure-sensitive materials require special precautions in handling and for placing them in position which increases considerably the cost of fitting or laying, without any certainty of obtaining satisfactory application. These disadvantages are due inter alia to the absence of dimensional stability of the material, for example when damp or when fitted to damp surfaces.

In particular the existing self-adhesive materials are liable to stretch during handling, and it is difficult to apply them even to flat surfaces without folds or creases. Moreover, it frequently happens that while they are being laid the first application is not satisfactory and it is necessary to remove the material which has just been applied to fit it again more correctly, but laying at two or more attempts weakens the adhesive and the adhesion to certain supports. Sometimes this operation gives rise to lifting of the support surface when it is of paper, such as can occur when the material is applied to a painted paper surface.

The manufacture of such material necessitates a paper backing which may be either stuck to the material or used as a screen in order to prevent the material from sticking to itself. In this case the paper must be peeled off prior to application and this is a delicate operation if stretching of the sheet material is to be avoided. This difficulty is increased when the carrier of the sheet material is itself a textile fabric such as is often used because of its attractive appearance as a decorative material or for wall hangings.

Other means are available for hanging mural fabrics by nailing them to battens or by normal use of an adhesive, that is to say, by coating the support with an adhesive, but these necessitate the services of experts.

It is an object of the present invention to provide an adhesive sheet material which avoids these disadvantages. In order to attain this object the invention provides a carrier consisting of a textile fabric which is inherently dimensionally stable or which has been made water-repellent, a continuous impermeable film adhering to one face of said carrier, and a layer of dry nontacky liquid-softenable adhesive carried on the exposed surface of said continuous film.

The textile fabric preferably comprises a dimensionally stable or stabilized and hydrophobic fabric material, the back face of which carries the continuous impermeable film which adheres intimately to the fabric material yet conserves its suppleness, reduces stretch and prevents fraying thereof, this film being provided with the layer of dry adhesive which is compatible therewith in order to adhere thereto; preferably the adhesive protects its suppleness against aging, is insensitive to humidity, heat or cold and can be activated by a suitable solvent prior to use.

The fabric material may be of natural or synthetic material, woven or nonwoven, knitted, bleached, printed or dyed. The fabriclike material may be water-repellent or hydrophobic so by treatment. Textile fabrics which are inherently stable are those formed from synthetic materials, especially polymers. The invention is not however limited to the use of textile fabric materials formed from synthetic polymer yarns, as it may be applied to natural-fiber textile products such as cotton, linen or jute, and it may further be applied to artificial cellulose-type yarns such as regenerated cellulose, cellulose ethers or esters, as well as protein fibers. Synthetic polymer-

type yarns may be polyacrylic polyamide, polyester and polyvinyl resin.

The method of producing the fabric material according to the invention consists fundamentally in treating a starting sheet material if required with a water-resistant repellent of known type, for example based on zirconium salts, fluorinated resins or pyridine derivatives to which a dimensional stabilizer may be added, then applying in a single pass in particular by spreading or spraying on to the back face of the fabric material an emulsion of a resin which is compatible with the textile fabric and has a viscosity such that the spreading process forms on the surface of the textile fabric material a film which is impermeable to water, is supple and of a thickness which is small but sufficient to form a continuous preferably smooth surface which adheres to the texture of the fabric material, and finally applying particularly by spraying or by spreading on the surface of said film a layer of an adhesive which is compatible with the material of the film and adheres both to the film and to another surface and has a thickness which is sufficient to adhere to rough or smooth surfaces, a drying process being preferably provided between each of the treatment stages.

The invention will be illustrated by the following description which gives some nonlimiting examples of practical embodiments. This description is illustrated by the accompanying diagrammatic drawing of a section through a material consisting mainly of a decorative textile fabric carrier 1 which has been treated with a substance which makes the fabric material water repellent and/or in some cases oil-repellent. A resin layer 2 is applied which renders the fabric dimensionally stable and confers nonstretch properties and prevents fraying. Finally a layer 3 of an adhesive is applied which can be activated either by an aqueous medium or by a solvent. If the adhesive can be activated by an aqueous medium, it should be insensitive by atmospheric humidity in order to permit easy storage without interleaved protective paper or the like, but it must be sensitive to water applied in the liquid state immediately prior to placing. Finally all the products utilized for the treatment of the fabric and for its successive coatings must be compatible with each other and ensure good intermolecular bonds and adequate mutual adhesion of the various layers.

The textile fabric material may be rendered hydrophobic by treating it by immersion in a bath containing zirconium salts such as sold under the registered trademark "PERSISTOL extra" by Badische Anilin und Soda Fabrik, or under the registered trademark "MYSTOLENE M K 3 " by Catomance. The fabric can also be rendered hydrophobic by immersion in fluorinated resins such as sold under the registered trademark "ZEPEL" by Dupont de Nemours, or under the name "SCOTCH GUARD" by Minnesota Mining and Manufacturing Co. Furthermore, pyridine derivatives can be used such as the product "PHOBOTEX" registered trademark sold by CIBA.

Stabilizers may be added to the hydrophobic products which may be compatible resins based on melamine urea, urea formaldehyde on and may be polymerizable or not. A typical example is the melamine formaldehyde product "KAURIT" sold by Badische Anilin und Soda Fabrik. According to the substance used for the impregnation a washable or spongeable and hydrophobic fabric is obtained.

The emulsion which provides the impermeable film may be in an aqueous medium or organic solvent medium. The resins used must be compatible with the coloring materials and with the adhesive and should be of the thermoplastic type. The film obtained therefrom may consist of a vinyl or acrylic polymer.

Various types of resins may be used as in the form of emulsions, for example polyvinyl, on polyvinylidene or acrylic chlorides or acrylic resins or other resins; which may be polymerizable or cross-linking or not, or already polymerized in the emulsion. The type of resin chosen should be unaffected by water. Emulsification may be effected mechanically or by means of an emulsifying agent. An appropriate thickening agent may be added which may also be nonswelling or unaffected by water after drying. The quantity of dry material

should be sufficient for the film to be formed in a single spreading pass. The viscosity of the emulsion depends upon the material used and must be controlled in such manner that a smooth continuous film is controlled in such manner that a smooth continuous film is formed on the surface and does not substantially penetrate into the fabric under the effect of the pressure exerted by the passage of the spreader blade. Also the presence of metal salts should be avoided which would have an adverse effect when the adhesive is activated.

In a solvent medium the resin may be of the acrylic or polyvinyl chloride kind or any other resin which has the above-mentioned characteristics.

The application of an emulsion in an organic solvent medium requires provision for the recovery of the solvent. Numerous resins can be used for example copolymers of vinyl chloride, cross-linked or other acrylic polymers or polymers produced by emulsion polymerization or otherwise. The thickness of the film depends on the film-forming properties of the resin. If a resin with a strong film-forming ability is used the thickness will be several microns; if a resin of weak film-forming ability is used the thickness will be several tenths of 1 millimeter.

The adhesive used is one which can be activated by water in the liquid state or by certain organic solvents so that whatever the nature of the surface may be to which the material is applied such as (wood, paper, paint, plaster, screed, or enamel), delamination cannot occur. In the case of activation by water, numerous conventional adhesives may be utilized, such as for example resins in emulsion, polyvinyl acetate emulsions which are sensitive to water, proteins, farina, starch, dextrine, casein, gums, polyvinyl, acetates and alcohols, iscoyanates and the like.

Typical adhesives are listed in "Les Colles Industrielles" by A. Rivat-Lahousse published by Dunod in Paris. This work describes:

On page 319 Polyvinyl esters and polyvinyl ethers,

On page 325–330 Acrylic resins,

On page 380 Casein based reversible adhesives, and

On page 395–401 Hide and bone adhesives.

Known protecting means against temperature changes to minimize reduction of flexibility or suppleness moisture absorption and aging are preferably added to the adhesive. The viscosity of the adhesive depends on the manner of application chosen, such adhesive being applied to a textile fabric material by spraying or spreading is selected in such manner that the required thickness of the adhesive, determined as a function of the structure of the textile fabric material, is obtained in a single pass. Whatever the viscosity a sufficient percentage of dry material must be maintained in the adhesive, for example of the order of 40 percent. In the case of activation in an organic solvent medium, an adhesive based on natural or synthetic rubber, plasticized polyvinyl chloride on other resins is chosen. The activation is effected by chlorinated solvents or solvents derived from benzene, on ketones other solvents. The solvent used for activating the adhesive must not react with the impermeable film deposited during the preceding stage of the treatment. The physical characteristics of this adhesive must be the same as those indicated in the case of the adhesive which can be activated with water.

Adhesive sheet material according to the invention may comprise woven or nonwoven fabrics formed of randomly arranged fibers, and; fabric materials can be used for decoration, tapestry, repairs, e.g., tent canvases, for lining of shower installations, bathrooms, interiors of caravans, interiors of cupboards, covering table tops and for other similar purposes. They are preferably offered in the form of rolls of 0.5 to 0.8 m. width with a cut edge which is not liable to fraying or stretching owing to the treatment received. Preferably after the surface to be covered has been brushed or cleaned, it is sufficient to activate the layer of adhesive with a sponge, a paint brush wetted with water or activating solvent (for example benzene or white spirit). In the case of activation by water, as soon as the whole adhesive surface has become opaque, the fixing is carried out by placing the surfaces to be stuck together in contact with each other and brushing the face of the material with a suitable cloth, In the case of activation with solvent, a finger is used to test that the adhesive has become sufficiently adhesive and thereupon the procedure is as described above in relation to the case of water activation. In both cases surfaces are obtained which are lined with fabric which adheres perfectly. The fixing or laying may thus be effected very easily and with little experience or skill.

Two examples of a material according to the invention are described below:

EXAMPLE 1.

1. A bleached cotton fabric of average density and printed or dyed was impregnated or fulled with a commercial emulsion of waxes and zirconium salts, such as are commercially available under the registered trademark "MYSTOLENE M K 3," "PERSISTOL Extra." The concentration of the bath recommended by the manufacturers is chosen by a test on a sample. Formaldehyde resins and the appropriate curing agent were added in order to obtain dimensional stability in addition to water resistance; the fabric was dried and subjected to a polymerizing treatment and then reeled.

2. The back of the water-resistant fabric material was coated by spreading with the product made and sold by the applicant under the Reference EP 299. This is a cation emulsion which is obtained mechanically in order to preserve the water resistant properties of the fabric and gives by simple drying a film which is insensitive to water, benzene, petroleum spirit (motor spirit) slightly sensitive to chlorinated solvents but is sensitive to acetone. The product EP 299 has an acrylic resin base ans is insensitive to water and emulsified mechanically to avoid the introduction of solubilizing groups. The product EP 299 is coated on the fabric material at a rate of 100–150 gm. per sq. m. according to the texture of the fabric material. The coating has been effected by a spreader or doctor of the air jet type in such manner that the layer of resin deposited is uniform and free from defects. The coated fabric material was dried and then reeled. 3. Adhesive:

a. For activation with water an adhesive based on a polyvinyl acetate emulsion is used thickened with a solution of dextrine to which has been added carboxymethyl cellulose in order to obtain the necessary consistency for the spreading operation. This neutral solution was protected by a permanent antiwetting product such as laurylpentachlorophenol for example. Spreading was effected on the dried fabric material obtained by the preceding stage in such manner that the required quantity of adhesive was deposited in a single pass, the quantity being a function of the structure of the fabric and of the state of the coating on the back of the fabric. The fabric thus coated was passed through a tunnel drier and stored.

b. For activation with a solvent the adhesive used was an emulsion of natural rubber in water in such manner that the subsequent activation can be effected with benzene or petroleum spirit (motor spirit).

EXAMPLE 2.

The first stage (rendering the textile fabric material water-resistant and dimensionally stable) of example 1 may be obtained by fulling the fabric material with the "GREF FRANCE" Product 275 having a base of pyridine compounds, manufactured and sold by the Applicant. The concentration of the fulling bath is 130 grams per liter of this Product 275 and 20 grams per liter of any suitable accelerator. In this way it was possible to omit the passage through the polymerizing stage and to obtain at the end of the treatment a fabric material which is easily detached when necessary and which can be sponged as it is insensitive to water. The sequence of manufacture is the same as in example 1.

What I claim is:

1. An adhesive sheet material comprising

a textile fabric carrier which has been made hydrophobic.

a continuous impermeable plastic resinous film adhering to one face of said carrier for minimizing stretch and fraying, and

a layer of dry nontacky liquid-softenable adhesive carried on the exposed surface of said continuous film.

2. The adhesive sheet material, as set forth in claim 1, wherein

said carrier is a fabric formed of a natural material selected from the group consisting of cotton, linen and jute.

3. The adhesive sheet material, as set forth in claim 1, wherein

said carrier is a fabric formed of an artificial material selected from the group consisting of cellulose acetate, regenerated cellulose and protein based material.

4. The adhesive sheet material, as set forth in claim 1, wherein

said carrier is a fabric formed of a synthetic material selected from the group consisting of polyacrylic, polyamide, polyester and polyvinyl resin.

5. The adhesive sheet material, as set forth in claim 1, wherein

said carrier is woven textile fabric.

6. The adhesive sheet material, as set forth in claim 1, wherein

said carrier is a nonwoven fabric formed of randomly arranged fibers.

7. The adhesive sheet material, as set forth in claim 1, wherein

said carrier includes a synthetic resin selected from the group consisting of a melamine urea resin and a urea formaldehyde resin.

8. The adhesive sheet material, as set forth in claim 1, wherein

said adhesive is selected from the group consisting of polyvinyl acetate, an amyl compound, an acrylic resin, a natural rubber and synthetic rubber latex.

9. The adhesive sheet material, as set forth in claim 1, wherein

said layer of dry nontacky adhesive is compatible with said film and adherent thereto,

said adhesive protecting said continuous impermeable film to minimize reduction of flexibility and suppleness by aging and which is substantially unaffected by moisture and by temperature changes and activatable by applied liquids selected according to the nature of the adhesive to render said adhesive tacky and adapted to adhere to a surface to which the sheet material is to be applied.

10. The adhesive sheet material, as set forth in claim 1, wherein

said continuous impermeable film comprises a resin compatible with the material composing said carrier.

11. The adhesive sheet material, as set forth in claim 10, wherein

said continuous impermeable film is selected from the group consisting of a copolymer of a polyvinyl compound and an acrylic compound.

12. The adhesive sheet material, as set forth in claim 10, wherein

said continuous impermeable film is substantially impermeable to liquids and supple and forms a continuous smooth surface on said carrier and is adherent thereto.

* * * * *