SELF-ADHESIVE DECORATIVE SURFACE COVERING MATERIAL

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2 Sheets-Sheet 1

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Fig. 1

CLOTH
ADHESIVE
FILM
PRIMER
ADHESIVE
RESIN
PAPER

Fig. 2

Fig. 3

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This invention relates to plastic films, pressure sensitive adhesives, and temporary carriers, and the combination thereof in making up articles adapted to cover surfaces.

It is known, of course, to produce a "band-aid" or bandage comprising a strip of plastic sheet, medicated or otherwise, having an adhesive undercoating to which a temporary carrier, as, for example, gauze, is adhered; the gauze being adapted to be stripped off from the adhesive and plastic covering just before the band-aid is adhesively applied to a surface to be covered.

It is also known to make disposable railroad tickets by supplying the under side of the ticket with an adhesive coating, and temporarily fixing the adhesive coated ticket to a backing such as paper or some other temporary carrier. When the period for which the ticket is issued becomes effective, the paper may be stripped off from the back of the ticket, leaving behind it a substantial residue of the adhesive composition which continues to adhere to the under-side of the ticket. Following removal of the temporary paper backing, the ticket is fixed as by the undercoating of adhesive to what may be termed for convenience a ticket holder or card, and during the period for which the ticket is effective, remains adhesively secured to this ticket holder, and at the end of such period is stripped off therefrom, subsequently to be replaced by another ticket for the next ensuing period of use.

According to the present invention, however, a disposable backing is supplied and adhesively secured to the under surface of a decorative article or object in the piece; for example, a web of cloth or plastic film bearing a design on its upper surface. A surface covering of this type may be used as wall paper in children's rooms and other rooms, to cover shelves in the kitchen, and to attractively ornament the interior and exteriors of cabinets, tables, and other home furnishings.

Another object of the present invention is the production of what may be termed a "package" article for the housewife comprising a composite sheet made up of bonded components, which she herself may use to cover any desired surface in the home or out of it with a decorative covering.

A further object is the production of a composite laminated article comprising decorative plastic film or cloth in the piece removable secured as by an adhesive to a temporary paper backing.

A still further object is a method and means for making laminated objects comprising plastic film or cloth in web-like form, temporarily bonded to a removable carrier wherein the surface of the carrier out of contact with the plastic film or cloth is printed with instructions to guide the housewife or other user in stripping the carrier from the film or cloth adhesively securing what remains, namely, the cloth or film carrying an undercoating of adhesive to a plane or other surface.

A still further object is a product of the character described adapted to cover curved and other non-planar surfaces as well as straight line surfaces by reason of its inherent plasticity or flexibility.

Another object of the invention is a method of making a laminated package adapted to cover a surface which comprises the steps of printing instructions for use on one side of a temporary carrier, coating its other side with a resin of such character as to furnish a relatively smooth surface to the carrier, subsequently depositing a pressure sensitive adhesive on the resin coated carrier on the opposite side to that on which the printed instructions appear, and thereafter adhesively applying a plastic film coating or cloth, having a distinctive design or texturized surface, or not, as may be desired, to the side of the carrier opposed to that which bears the instructions.

A further object is a method and means for annealing plastic film surface coverings of such character referred to above so as to relieve the stresses and strains therein, both natural and those acquired as a result of prior processing, thereby establishing dimensional stability in the finished article.

With the above and other objects in view, as will be apparent, the present invention consists of the construction, combination, and arrangement of parts and/or steps, all as hereinafter more fully described, claimed and illustrated in the accompanying drawings wherein:

FIG. 1 represents a schematic arrangement of the surface covering package components, all or some of which may be employed in carrying out different embodiments of the present invention, and including the basic essentials of the article, namely, the base film with or without cloth, a temporary carrier, and the adhesive therebetween; the carrier being adapted to be readily stripped from the adhesive and the film base at the time when the surface is to be covered.

FIG. 2 indicates diagrammatically a typical arrangement of apparatus for printing a design or otherwise applying a surface texture to the outer side of the base cloth or plastic film before it is applied as a wall covering or other surface covering, and the same or a similar arrangement of apparatus also may be employed for printing instructions to the housewife or any other user on the under-side of the temporary carrier, which, after use, may be readily disposed of in any convenient manner.

FIG. 3 illustrates (also diagrammatically) a convenient means or assembly for coating the opposite surface of the temporary carrier, that is, that which does not have the printed instructions thereon, with the adhesive and the film, and in addition one or more auxiliary coatings or passes such as a preliminary resin application for the undersurface of the carrier for the purpose of giving it a relatively smooth constitution. The same means may be employed for interposing a primer coating between the coating of adhesive and the plastic film or cloth.

FIG. 4 discloses means for simultaneously bonding the plastic film to cloth and stripping the casting paper from the film.

FIG. 5 indicates an appropriate assembly for applying a coating of adhesive on top of the primer coat prior to the final wind-up of the plastic-coat embodiment.

FIG. 6 shows the relative position of the several components making up the present article after all coatings have been applied, but before the final wind-up and FIG. 7 again illustrates the relative position of some of the component members at the time of the last wind-up, and in particular indicates the manner whereby the topmost coating of adhesive is wound up on the take-up roll, so as to contact the bottom or outer exposed surface of paper.

There is contemplated herein, as explained above, a multi-component composite bonded article which may be sold as a package to the housewife or any other person desiring to cover a surface, whether it be smooth, broken, straight, or curved, and a method and means for producing such composite package. To that end, there is proposed the bonding, by a pressure sensitive adhesive, of a plastic film with or without cloth, and with or without
a design or decoration, to a temporary base, preferably of relatively heavy paper; the arrangement being such that when the package is to be used for the purpose intended the paper readily may be stripped off, thus exposing the pressure sensitive adhesive which remains adherent to the plastic film whereby the covering may be adheringly secured to the surface to be covered.

If desired, the paper which serves as the temporary carrier for the plastic film may also comprise printed instructions explaining how the article may be employed to cover the surface.

As a matter of practice, it is preferred not to apply the pressure sensitive adhesive directly to the paper, but rather to incorporate between a barrier of the plastic or resin type for the purpose of preventing the paper from adhering too strongly to the adhesive, thereby facilitating the step of stripping the temporary paper carrier from the adhesive coated plastic film. An extra barrier coating, of polyvinyl alcohol, may be interposed between the paper and the plastic or resin, but this is not essential.

Moreover, the preferred adhesive is a polyisobutylene adhesive, for this tends to enhance the flexibility of the product essentially in its relation to the application thereon to curved surfaces and other uneven irregularities.

To serve as an anchoring base between the polyisobutylene type adhesive and the plastic film, a primer coating on the rubber latex type may also be utilized as a coating intermediate the layer of adhesive and the upper layer of plastic film.

On top of the cloth or plastic film, of course, appears the design or other texturized surface, if such be specified, and the design or texture may be imparted as by printing, embossing, or otherwise to the base film or cloth.

With respect to the application of plastic as the base component of the package, the preferred film is polyvinyl chloride in combination with non-migratory plasticizers of the polymeric type. If polyvinyl chloride constitutes the base member of the product for covering surfaces, and is to incorporate a printed design, such ornamentation or pattern should comprise vinyl inks so that the printed matter and its composition will be altogether compatible with the base to which they are to be applied. The rubber latex composition, as stated, may be a rubber latex composition and may be put on so as to be in contact with the adhesive, in at least three different ways: viz.: by reverse roller coating, by knife coating, and by pad-roll coating. The adhesive, plastic film, and the phenolic type resin also may all be applied in these different ways. The function of the primer coating is to give added adhesion and impart a much longer shelf life to the product.

With respect to the adhesive, this comprises a synthetic rubber type composition which does not oxidize or promote oxidation.

The slip strip paper may be kraft paper coated with a composition that has no affinity for the vinyl film.

The instructions may be printed on the outer surface of the slip strip paper with a phenolic thermosetting resin, namely, phenol formaldehyde, which prevents offset which would occur if the instructions were printed with vinyl resin.

If cloth in combination with plastic film is the base which is to cover the surface, then usually printing inks other than vinyl inks make up the printing composition for the cloth.

In carrying out the present invention and the embodiment thereof which apprehends cloth laminated to plastic film as the base, or surface covering, a suitable length of goods in the piece may be printed with a pattern in the usual way, and dried. Then a film of the plastic is cast or coated or otherwise applied to casting paper. The film is then dried and cured. A thermoplastic adhesive is then added, on top of the cured film. Subsequently the film is combined with and bonded to the fabric, primer and adhesive coatings are applied to the plastic film side of the composite cloth-film and the coated plastic film is adheringly resealably bonded to a temporary carrier backing.

In the case of film as the base without a cloth laminate, the film is printed in the usual or conventional way and dried at about 165° F. for about 6 minutes. Then the primer coating is applied, and the then printed film bearing the primer is run through an oven about 100 feet long, its speed of travel there through being so regulated as to take about 6 minutes, and here the annealing occurs with the temperature being controlled constantly at an even temperature of about 290° F. to relieve the stresses and strains inherent in the nature of the film, and also to relieve the stresses or strains which it may have acquired by reason of its prior processing. This step of passing the film through an oven or other heating device for a relatively prolonged period of time, and at relatively high temperatures, may be characterized as the step of annealing, and has been found to be of considerable importance in establishing dimensional stability for plastic film processed according to the present invention. If temperatures substantially below a temperature of about 290° F. are employed, or if the film of plastic is not heated sufficiently long, then the film does not lose its stresses and strains, and after the finished article has been cut, formed, or otherwise made from it, there will be a tendency for the finished articles, thereby being objectionable for its intended purposes and uses.

Further, in the matter of processing plastic film according to this invention, of annealing the printed film, which follows the application of the primer coat, the adhesive and the strip simultaneously are applied, and a composite laminated product is thus obtained by its passage through an oven or other heating device approximately 100 feet in length at such a speed as to require about 6 minutes for such passage, the temperature of the oven being maintained at about 290° F.

Apparatus for the production of surface coverings of the character described above is indicated diagrammatically in FIGS. 2 and 3. Referring now particularly to FIG. 2, such apparatus may comprise means for printing instructions on the exposed surface of the kraft paper, and also for printing any desired pattern on the top surface of the plastic film or the cloth. To that end such apparatus may include a bath containing any suitable printing composition in which an engraved color print roller 11 rotates, the print roll 11 forming a nip with the pressure roll 12 through which the paper or cloth 13 is to be printed with instructions or with a design is trained and unwinds from a source and is the source 14. The cloth 11 is, of course, engraved with the design or the instructions, and after its passage through the nip of the rollers 11, 12, the paper or cloth 13 has imprinted thereon the necessary instructions or the desired pattern, or both. After its passage beyond pressure roller 12 the printed cloth or paper 13, or both, may be run through a drying oven as at 15, and then around guides 16, 17, and from thence to a take-up roll 18.

Referring now to FIG. 3, after the paper has been printed with the instructions and wound up as at 18, it may be removed to another range of apparatus, as indicated in FIG. 3, and there unwound from a take-off roll 19 for passage over a smoothing roller 20, and from thence through the nip of a pair of applicator rollers 21, 22. As the paper passes through the nip of the applicator rolls 21, 22, it may receive a deposit of plastic film, primer and/or adhesive of the character described above as by means of the trough 23 containing a supply of the film dispersion, primer, or adhesive, which is fed out upon the working surface of the upper roller 24 rotating in the direction of the arrow as shown, thereby to carry the film, primer, or adhesive composition from the surface of supply 23 to the adjacent working surface of the ap-
The composite plastic film-cloth may comprise a source of supply 48 for the laminated film-cloth operating in conjunction with a supply of the temporary carrier which may comprise kraft paper 49, the arrangement being such as to advance the kraft paper upon which the plastic film-cloth 48 is superposed, under suitable lease rolls 50, 51, and from the lease roll 51 between a pair of rotating rollers 52, 53 coating with a simultaneously rotating doctor roll 54 whereby the adhesive 55 is supplied to the upper exposed surface of the film 48.

As shown in FIG. 6 of the drawings, it is to be understood that after the adhesive 55 is applied to the composite laminate 49—49, the arrangement of the several components is as follows: on the bottom is the kraft paper surface, and immediately above, of course, is the body of the kraft paper itself. Overlying the paper body is the fabric or cloth, and bonded to the upper surface of the cloth is the vinyl chloride film. On top of the vinyl chloride films are successive overlying coatings of the primer and the adhesive.

With the arrangement of the several components making up the bonded plastic film-cloth-paper laminate, as described in the preceding paragraph, the final product in that form may be run through an oven 56, and after its emergence therefrom may be taken over by a take-up roller and then on to a final take-up roll 58. As shown in FIG. 7, the relative arrangement of the several components as the final product emerges from the oven 56 is preserved at the wind-up station 58, so that as the final product passes over the guide roller 57, on top is the adhesive 59, on the bottom is the kraft paper 60, and in the middle is the film-fabric laminate 61. As the composite product 59—61 is actually wound up on the final take-up roll 58, as will be apparent from FIG. 7, after the adhesive component 59 has made more than one complete revolution on the take-up roll 58, it thereafter is wound up upon the paper outer surface 60; that is to say, the upper surface of the layer of adhesive 59 subsequently, on the take-up roll 58, comes in contact with the exposed underface of the paper 60. Thus, the composite plastic film-cloth-paper product may be retained on the take-up roll 58 until ready for use according to the tenor of the purposes and objects of the present invention.

What is claimed is:
1. Method of making self-adhesive decorative surface covering material in sheet form for walls, shelves, furniture, home furnishings, and the like, which includes the steps of applying a decorative pattern to the top side of the material and a pressure sensitive permanent adhesive to the under side thereof, securing a temporary paper backing to the exposed pressure sensitive permanent adhesive, said backing being adapted subsequently to be stripped from the adhesive, and printing instructions on the exposed surface of said temporary paper backing for stripping the backing from the adhesive and applying the decorative surface covering to a surface to be covered.
2. Composite laminate in sheet form comprising cloth having a printed design on one surface and a coating of adhesive on its other surface, a film containing polyvinyl chloride bonded by means of said adhesive to the printed cloth and having a surface coated with a second adhesive out of contact with the first adhesive, and a temporary paper backing secured to the film by means of the second adhesive, and having a free surface bearing printed instructions for separating the temporary paper backing from the remainder of the composite laminate.

1. Method of making a composite cloth-plastic film-kraft paper laminate which comprises the steps of printing a design on one side of a length of cloth, coating a film of polyvinyl chloride plastic on a temporary support, drying and curing the polyvinyl chloride film, laying down a thermoplastic adhesive on top of the cured film, and subsequently combining the cured film with the fabric, removing the temporary support from the plastic film, adding successively coatings of a rubber latex primer and
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4. Method of making a composite cloth-plastic film-kraft paper laminate which comprises the steps of printing a design on one side of a length of cloth, casting a film of polyvinyl chloride plastic on a temporary support, drying and curing the polyvinyl chloride film, laying down a thermoplastic adhesive on top of the cured film, and subsequently combining the cured film with the fabric, removing the temporary support from the plastic film, adding successively coatings of a rubber latex primer and a polyisobutylene adhesive to the exposed surface of the cured film, and securing a slip strip carrier backing to the free coated surface of the plastic film.

5. As a new article of commerce, self-adhesive decorative surface covering material in sheet form for walls, shelves, furniture, home furnishings, and the like comprising an opaque plastic film bearing a decorative pattern on one side and coated with a pressure sensitive permanent adhesive on its other side, and a temporary backing in contact with the adhesive, said backing being adapted subsequently to be stripped from contact with the adhesive.

6. As a new article of commerce, self-adhesive surface covering material in sheet form for walls, shelves, furniture, home furnishings, and the like comprising decorated plastic film exposed on one side and coated on its reverse side with a pressure sensitive permanent adhesive, and a temporary backing in contact with said permanent adhesive, the backing being adapted subsequently to be stripped from contact with said adhesive.

7. Self-adhesive cloth-film laminate for covering surfaces comprising in combination, cloth fabric in the piece printed with an ornamental design on one side only, the unprinted side of the fabric being coextensively secured to one side of a film of vinyl chloride in sheet form, the opposite side of said film being coated with a pressure sensitive permanent adhesive, and a temporary backing releasably adhered to the permanent pressure sensitive adhesive and adapted to be stripped therefrom.

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