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J. F. CARPENTER
FLEXIBLE DECORATING WEB

1,985,480

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Fig. 1-

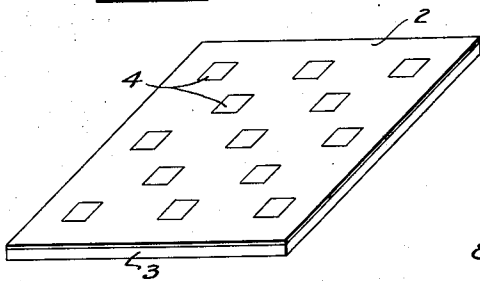


Fig. 2-

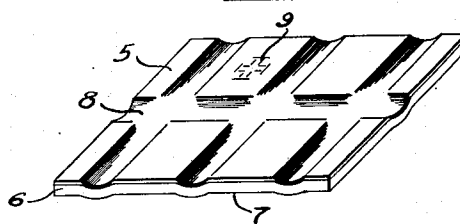


Fig. 3-

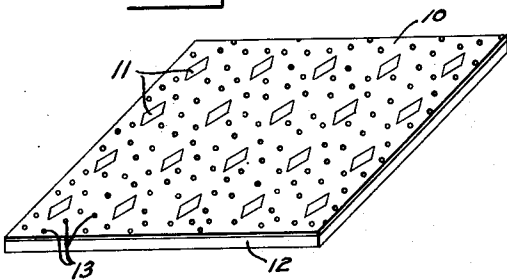


Fig. 4-

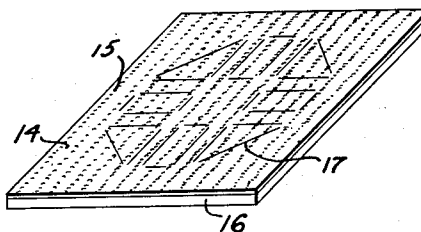


Fig. 5-

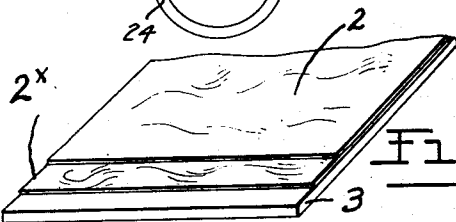
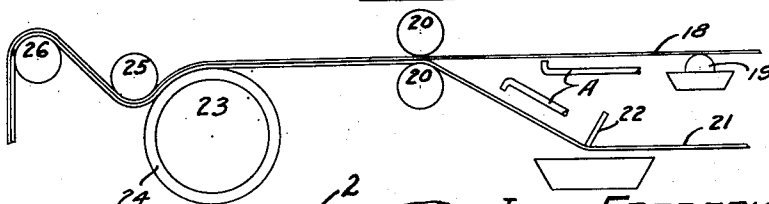


Fig. 6-

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FLEXIBLE DECORATING WEB

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2 Claims. (Cl. 41—24)

This invention relates to decorated webs and their manufacture, and more particularly to a flexible decorated web adapted for wall or other covering.

5 In the manufacture of wall covering, various attempts have been made to secure flexible, decorated webs by using a coated or saturated fabric or felt stock as a base, and applying thereon various paints or other decorations. In some cases, 10 the materials used as a base have been saturated with varnish; in others they have been saturated or coated with nitrocellulose and varnished later; and, in other cases, the base stock has been saturated with asphalt. These attempts have been 15 unsatisfactory and particularly in the cheaper forms where felt saturated with asphalt is used as a base stock, the inherent nature of such base stock requiring that it be covered, and augmenting the difficulties of decorating the web.

20 It is an object of my invention to provide a thin, flexible, decorated surface-covering web which is water-resistant. It is a further object of my invention to provide a decorated surface-covering web having a depth of color and delicacy 25 of decoration not heretofore available in serviceable forms and at low cost. A further object of my invention is to provide a serviceable, washable, decorated web having sufficient flexibility to render it easily applicable to all types of surfaces. These and other objects will be more readily 30 understood by reference to the accompanying drawing illustrating certain preferred embodiments of my invention, in which:

35 Figure 1 is a perspective view of a decorated, laminated web embodying my invention;

Figure 2 is a fragmentary view illustrating another form of my invention;

40 Figures 3 and 4 are fragmentary perspective views illustrating other embodiments of my invention;

Figure 5 illustrates, diagrammatically, apparatus useful in carrying out a preferred method of manufacturing decorated webs according to my invention;

45 Figure 6 represents a fragmentary, composite, perspective view showing details of construction of a further embodiment of my invention.

Referring to Figure 1, there is shown a decorated sheet material or fabric of a laminated 50 structure comprising an outer transparent face web 2 and a flexible base web 3 adhesively secured thereto. A decoration 4 is visible through the transparent face web 2.

55 The transparent face web may be a sheet of cellulose nitrate or cellulose acetate, a transpar-

ent paper or other material having the essential characteristics required by the face web. I prefer to use a sheet of modified cellulose, such as the transparent sheet derived from viscose, for this purpose.

5 The base web 3 is a flexible material, such as paper or coated, flexible fabric, preferably water-proofed or sized to prevent or substantially inhibit water absorption. It is desirable that the base web 3 be of a color appearing in the decoration, or of a color lending itself to ready coverage 10 by the decoration employed. I may use cloth-lined paper or fabrics impregnated with latex, nitrocellulose, varnish or synthetic resins, in all cases, the impregnating material being preferably, but not necessarily, light-colored. I may 15 also employ paper or fabric covered with metal foil or coated with metallic inks or paints where a metallic sheen is desired in the finished decoration. Other suitable base webs which will occur 20 to those skilled in the art may also be employed.

The decoration 4 is covered by the face web 2. This decoration may be printed on the back of the face web 2 or on the face of the base web 3. 25 In either case, the coated or other surface of the base web 3 will be visible through the transparent face web 2 and through the transparent adhesive securing the face web 2 to the base web 3 and which has not been indicated in Figure 1 because of the limitations of drawing which would 30 require that the adhesive layer be shown in thickness entirely out of proportion.

The decoration 4, whether painted on the back of the face web 2 or on the face of the base web 3 or whether it be an independent element placed 35 therebetween, is entirely protected by the face web 2 and by the base web 3. The face web 2 may be colored throughout its body, and when this is done a quality of decoration having a depth of color not producible by the paint methods now available is produced. It is desirable 40 that the base web 3 have a surface of good light reflecting quality when darker colors are used in the face web 2. Very beautiful effects are obtained by executing the decorative elements 4 with metallic inks and a very rich sheen results 45 when the base web 3 is treated with a metallic coating or foil over which is adhesively applied a colored modified cellulose or cellulose derivative. The metallic inks or coatings may be 50 applied to the back of the face web 2, as well as to the face of the base web 3, depending upon the types of decoration desired. Where the face web 2 consists of a water-proof, colored cellulose hydrate, which is a relatively expensive com- 55

ponent part of the laminated structure, it may be found desirable to place as much of the decoration as possible on the base web 3 in order to avoid the losses which would attend the printing and handling of the colored, waterproof cellulose hydrate web.

Where, due to the nature of the base web 3 or of the decoration applied to the base web, it is not convenient to apply an additional decoration, such as metallic inks or coatings, these additional decorations, which are to overlie the decorated base web 3, may be applied to an intermediate transparent web of material 2^x, which may be of the same material as the face web 2, although the intermediate web 2^x need not be waterproof. With such a structure, the decorated web, in its finished form, would comprise three layers (see Figure 6), two of which will be transparent, the outer being preferably water and soap resistant so that the finished product is washable, and either or both of the transparent webs being tinted or colored. Sharply contrasting color effects are secured by dieing out a pattern in one of two colored overlying webs. The adhesive employed is, in all cases, transparent.

In Figure 2, there is shown an embodiment of my invention in which a thin, flexible, decorative web having the appearance of solidity and depth is produced by adhesively securing a face web 5 to a base web 6 which latter is sufficiently thick to permit embossing while retaining a relatively smooth back surface 7. In this embodiment, tile-like units are produced by embossing and printing simultaneously. The base web 6 may carry a printed or other desired decoration (not shown) on its top surface which will be visible through the face web 5 in the completed article. This decoration may, if preferred, be applied to the back of the face web 5. A very realistic tile-like decoration having a variegated tone and highly attractive depth of color is obtained by adhesively securing a mono-colored cellulose hydrate or acetate face web to a coated base web having a clouded decoration in delicately blended colors on its surface. The clouded decoration may advantageously be printed or sprayed on the back of the face web 5, using a solvent having a dissolving effect upon the face web 5 to key the decoration thereon. The two webs being laminated, "interliners" 8 are printed and embossed on the web. The "interliners" may be printed in matte or gloss colors to imitate various types of cement. The "tile" areas will vary within themselves because of the clouded decoration appearing through the colored face web and will vary somewhat between each other. The effect of light penetrating the colored face web and being reflected back through the colored face web produces an effect resembling carefully glazed colored porcelain ware. Where a simulation of hand-laid tile is desired, figures 9 are printed and embossed in the tile areas. Similar or other figures may be printed on the back of the face web or on the face of the base web, but in these cases close registration between the embossing and printing roll which prints the "interliners" and the printed decoration is required. Since the decoration which is printed and embossed lies below the general surface of the finished sheet, there is little likelihood of the decoration being injured or removed by cleaning if care is exercised.

In Figure 3, there is shown a flexible, laminated web in which a combination of decorations on the

face web and base web cooperate to form a unitary effect. In this embodiment, the face web 10 is provided with a decoration 11 applied thereto. The decoration 11 is preferably printed on the side of the face web which will lie adjacent a base web 12 so that it will be protected by the thickness of the face web 10. On a base web 12, which may be a coated or sized paper, etc., there is printed a decoration 13 which will be visible through the face web 10. The decoration 13 may advantageously be of the so-called "running" pattern, that is, without noticeable repeat, in order to minimize the problems of registration between the two patterns when the webs are laminated. The face web 10 may be colored and when this is done, a remarkable effect is secured by printing the decorations 13 in metallic colors or printing on the base web 12 with metallic inks. One of the decorations may be printed in flat color while the other is printed with a metallic medium, and in this case I prefer that the flat color be applied to the base web, although this may be varied to suit the design. A variation in effect may be obtained by merely sandblasting a design on the transparent face web, the untreated portion of the face web remaining transparent. In this way, variations in design are obtained without an additional printing step, and no time is required for drying the decoration, the sandblasted design being ready for application immediately.

In Figure 4, there is shown a laminated web in which the face web 14 carries a "running" pattern 15. This "running" pattern may advantageously comprise a succession of fine dots or dashes, such as Ben Day tints, printed on the back of the face web 14. A base web 16 is adhesively secured to the face web 14 and carries a printed decoration 17 visible through the face web 14 and the "running" decoration 15.

In Figure 5, I have illustrated, diagrammatically, apparatus suitable for carrying into effect the assembling of my laminated web. A face web 18 is drawn across an adhesive-applying roll 19 to a pair of squeeze rolls 20. Simultaneously, a base web 21 is drawn across an adhesive-applying doctor 22 by the same pair of squeeze rolls 20. The squeeze rolls press the two adhesively treated faces together and the compound web is led to a drum 23 which, in the production of an embossed type of article shown in Figure 2, presents a soft periphery 24 to take the embossing ribs of an embossing or indenting roll 25. The peripheral surface of the drum 23, of course, may be complementary to the embossing roll 25, but I have found that a soft pad serves quite well. The finished sheet is led off by a conveying roll 26 for inspection and trimming. It is desirable that the embossing be carried out while the adhesive is plastic. This is readily controlled by the speed of the sheet and the drying of the adhesive. I have shown two airblasts A which serve to take off the solvent employed in the adhesive. By varying the amount of air, the temperature thereof and the speed of the sheet, any desired plasticity of adhesive may be obtained at the time the laminated structure arrives at the drum 23.

I have found that ordinary clear nitrocellulose lacquer forms a satisfactory adhesive for securing cellulose hydrate or cellulose acetate to a decorated paper web. Thermoplastic adhesives may be employed to advantage where speed of operation is important and solvent recovery is not available. Various colored adhesives are used where it is desired to introduce an additional tone into the decoration. Certain types of modified cellu-

lose sheets may be cut with low-boiling organic solvents, such as ethylene-glycol-mono-methyl-ether and similar types. In some cases it may be more convenient and practical to soften the applied web with an appropriate solvent and thus secure a laminated structure with a decorated base web protected by a transparent face web without an intermediate adhesive. In such cases it is recommended that there be no decoration on the side of the face web next to the base web unless it be of such character that it is not spoiled by the softening of the web by the solvent.

In embossing the laminated web described above, I prefer that the embossing pressure be sufficiently great and the supporting pad be sufficiently soft that the embossing is "reflected" on the back of the goods. The base web should be sufficiently thick to permit a certain amount of indentation with little or no distortion of the back of the web, but I have found that the embossing is more permanent and is much more uniform with respect to the depth of lines running transversely of the web as compared with lines running longitudinally of the web when the embossing pressure is permitted to distort the back of the base web to a certain extent.

The back of the finished web may be advantageously treated with a waterproofing agent which will provide counter tension for the face web and its applied decoration. A varnish, which may be dissolved by the solvent of the adhesive which is used to secure the web to the surface to be decorated, is of some advantage. Where hard service is required of the web, as in the case of wall coverings applied in public places, additional protection and waterproofing may be provided by coating the outer face of the web with a waterproof, transparent, protecting film which may comprise a cellulosic lacquer or a synthetic resin dissolved in a suitable solvent. Due to the limitation of drawing, I have not illustrated the varnish or other lacquer which may be used on the back of the base web 3 in the finished product.

I do not wish to be limited in the type of decoration which may be applied to the face of the base web or to the back or face of the face web. Decorations which are floated, such as marble effects, may be applied as readily as decorations which are printed, and decorations which are

coated or sprayed may also be employed. In some cases, the whole of the decoration will be carried by the transparent face web, as where a sheet of colored cellulose hydrate will be printed and then coated with a white or colored paint after which the sheet may be mounted adhesively upon a suitable surface. My improved decorating web, however, will, in all cases, be flexible and readily applicable to any supporting surface in much the same manner as wall paper. In some types of construction, it will be desirable to mount the web upon stiff panels for easy application in another structure. The flexibility of my decorated web makes it easy to conform the web to any surface or panel ordinarily encountered.

While I have illustrated and described certain preferred embodiments of my invention, it will be understood that the invention is not so limited but may be otherwise practiced and embodied within the scope of the following claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of making an imitation tile or brick floor or wall covering which consists in forming a flexible relatively thick base web, and a relatively thin, externally washable, generally transparent face web, simultaneously coating the juxtaposed faces of said base and face webs with a generally transparent cement, partially drying said cement, and subsequently passing said base and face webs through a pressing, embossing and printing device to secure said face and base webs together and simultaneously to emboss and print the webs thus secured to produce a pointed tile or brick effect, there being decorative designs visible through said face web.

2. An imitation tile or brick floor or wall covering comprising a relatively thick flexible base web and a relatively thin, generally transparent flexible face web, a transparent cement securing said base web to said face web, there being decorative designs visible through said face web, said floor or wall covering having raised portions simulating the appearance of tile or brick units or the like, which portions are interspaced with embossed dividing depressions printed to simulate a pointing effect.

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