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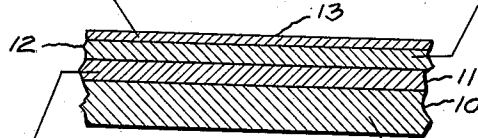
2,276,567

DECORATIVE PANEL

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VERY THIN PIECE OF WHITE
PAPER TO PROTECT SURFACE
OF DRAWING OR ART WORK
WHERE USED AS WALL PANELLING-
WHERE USED AS FLOOR TILE HEAVY
SHEET MAY BE EMPLOYED

DRAWING OR ART WORK- SUCH AS
PICTURE OR DESIGN ON PAPER OR
FABRIC - FOR EXAMPLE WITH
TEMPORA COLORS



THIN WHITE PAPER BACKING
SHEET- SUCH AS UNSIZED
OR UNFILLED PAPER
PREFERABLY WITHOUT RESIN
IMPREGNATION

BASE CONSISTING OF RESIN
IMPREGNATED PAPER - SUCH AS
AMBER PHENOLIC ALDEHYDE RESIN
OR TRANSPARENT UREA ALDEHYDE
RESIN- CONTAINING ABOUT 60 TO 70%
RESIN-USUALLY OF A DARK COLOR-
THICKNESS DEPENDING UPON WEIGHT
OF PANEL DESIRED

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DECORATIVE PANEL

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9 Claims. (Cl. 41—22)

The present invention relates to the production of panels and it particularly relates to the production of decorative panels to be applied to walls and for other uses.

It is among the objects of the present invention to provide an improved process for making decorative panels, particularly out of drawings, sketches or other art work, in which the drawings or art work will be permanently mounted and will not be subject to deterioration on exposure to atmosphere, sun or moisture.

Another object is to provide a simple, economical and inexpensive process of making decorative panels which may be used either for interiors or exteriors with assurance that the panels will be substantially permanent and will not deteriorate, fade or lose their attractiveness although used for long periods.

Still further objects and advantages will appear from the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the invention.

According to the present invention, it has been found that decorative panels may be readily prepared from sketches, drawings or collations, whether upon paper or on fabric, where such drawings, sketches, etc., are properly backed and positioned in sandwich-like fashion between resin impregnated sheets for materials which are then subjected to a high forming pressure in excess of 1000 to 2500 pounds per square inch and at temperatures of 250° to 500° F.

Although many different procedures may be employed, it has been found desirable first to select a large number of sheets of paper or fabric which have been impregnated with a synthetic resin in its fusible soluble form or B-state, in which state it may be readily converted into infusible form of C-state by treatment with heat and pressure.

In the preferred procedure, the panel is formed of a base which consists of a large number of sheets of B-state resin impregnated paper from 5 to as many as 40 in number. This base may have a rather dull, dark brown or heavy color.

On top of this base is placed a white opaque sheet which also may be resin impregnated. It has been found most desirable for purposes of this invention, to impregnate these sheets with urea formaldehyde or other nitrogen base—aldehyde resins in reactive state or with glyptal res-

ins or other resins of the glycerol-phthalic acid-organic acid family.

Then on top of this base which usually has a dark brown or blackish color but which may also be light colored, is applied one or more white sheets at least one of which is preferably unimpregnated with resin and, if desired, one of these white sheets, preferably the one unimpregnated with the resin which is quite porous, may carry the drawing or sketch. Preferably, however, on top of the white backing sheet or sheets which are positioned on top of the relatively dark base sheets, is then placed the drawing or sketch which it is desired permanently to mount.

This drawing or sketch is preferably made upon a permeable medium, screen or a net, such as a fabric or paper. Applied to this net or fabric may be a drawing, a pencil sketch, gold or silver or colored papers, or bronze powders.

It is most important that the material applied be devoid of oil or fatty materials and that only water or dry colors be applied to the net, whether it be a fabric or paper, which carries the drawing which is to be permanently mounted. Metal or bronze powders, chalks, pastels, drawing inks, charcoal, indelible or water color pencils, non-oily or non-waxy crayons, or water colors, either of opaque or transparent nature, may be employed, together with a vegetable adhesive or wheat flour paste, but as a general rule, it is desired to avoid any application to the drawing which will prevent penetration therethrough of the resin from the rear or base impregnated resin sheets.

The preferred colors which are used in making the drawing are those included in the temporary colors. Where linens or cottons are used as a base to carry the sketch or art work and to be superimposed upon the white backing sheet and the multi-ply base sheet, such linens or cottons should be thoroughly washed to remove all size, and if they are dyed, they should be treated with a fast dye which will not tend to run or become dissipated as a result of the heat treatment during the permanent mounting.

The design or art work may also be made of pieces of fabric or paper laid together to form a design. Fabrics, knit or woven, alone may be used as a decorative surface, the knit or weave plain or jacquard or otherwise taking the place of any applied decoration with or without threads, laces, wool, staples, metal wire, wood fibres, mother of pearl and so forth.

As a general rule, the white paper backing

should permit ready penetration of resin and in such case the resin may be omitted from some of the backing sheets. Upon the base for the art work or drawing or sketch there may be applied in decorative style or fashion pieces of paper, thin wood, grasses, leaves, butterfly wings, flower petals, etc., which will be impregnated by the resin and thoroughly impregnated thereby as a result of the heat and pressure operation.

Among the papers which may be used as the white base for the drawings or art work are yoshino paper, or tea paper.

The tea paper may be positioned upon the base in such a way so that different portions thereof will have different reflective values to portray and bring out various contours and give rise to various artistic effects. These metal foils may also be burnished in part or whole also to add to such effect.

In making the final panels, it is quite desirable that the top of the painting, drawing, sketch or other art work to be covered before being subjected to the heat and pressure. If desired, a thin sheet of impregnated material may be employed for this purpose or a sheet of Celluloid or cellulose acetate or even of regenerated cellulose may be applied over the top of the drawing which has been previously backed up by the white paper of the multiplied base. The final sheet, if desired, may be varnished or lacquered with various synthetic or other resin solutions or even cellulose acetate or cellulose nitrate solutions.

If desired, it is also possible to superimpose upon the drawing or art work a crinkled or wrinkled regenerated cellulose sheet, or a similar wrinkled or crinkled sheet of cellulose nitrate or cellulose acetate, to give a mottled or crinkled appearance to the final panel.

If desired, the drawing or art work may place about the central portion of the panel, sufficient marginal space to give a border and the molding equipment may be of such a nature as to offset a portion of the periphery of the panel or the entire periphery of the panel in respect to the middle portion of the panel, to give a framed effect.

It is often found desirable in forming the final panels, to impregnate the surface sheets with an agent such as paraform or hexamethylene tetramin, or some other similar hardening agent which will have the effect of hardening the outer surface or coating of the resin to a much higher degree than the inner layer of resin, with the result that a much more permanent panel construction will be obtained.

As a general rule, in this type of construction it is desirable to use a harder resin or to create a harder resin at the surface of the panel than at the interior of the panel, as it is found that such a construction is more resistant to cracking or shrinking of the panels. This conveniently may be accomplished by applying sheets of impregnated paper or textile so thin that they will not obscure the drawing or sketch, but which will contain resins having a higher proportion of formaldehyde or aldehyde in respect to phenol or urea or other resinifying agent than the resin which is used for impregnating the base sheets in back of the drawing or sketch, as the case may be.

It is also desirable that the surface resin be of lighter color than the base resin and that where sheets are used above or below the drawing or picture, that a darker resin be used for the backing and a lighter resin for the surfacing sheets.

For example, it is possible to use a phenolic aldehyde resin for the base and a glyptal or an alkyl resin or a urea or other nitrogenous-aldehyde resin for the surface, since the latter produces better water-white surfacing and will prevent the phenol formaldehyde resin from penetrating into the art work and preventing darkening thereof.

If desired, the impregnated resin sheets, while dry, may be first connected together in a laminated structure by a water soluble adhesive, such as dextrine or heated starch or gelatin, or a high grade glue, and then upon application of the heated pressure, these water soluble adhesives will be taken up and combined with the resinous material.

To give different shades, it is also possible to apply various types of opaque mineral pigments to various parts of the drawing which is to be mounted. Among such pigments may be included titanium oxide, zinc sulphide, chrome oxide, lamp black, iron oxide, etc.

These various pigmented oxides may be applied in the form of a dispersion in the water soluble adhesive, or, less preferably, in the form of a dispersion in the varnish or lacquer.

The drawing diagrammatically illustrates one form of the present invention, but the present invention is not limited thereto, since many variations and modifications may be made therein in accordance with the specification and disclosure of this invention.

In the drawing, the base 10 is formed of laminated resin or plastic impregnated paper or fabric, the resin preferably being an amber phenolic formaldehyde urea or a transparent urea formaldehyde resin. Usually the base 10 is of a dark color and the thickness depends upon the weight of the panel desired.

In respect to the sheet or lamination 11, this is a thin white paper backing sheet preferably formed of an unsized or unfilled paper without resin impregnation.

The sheet 12 consists of the drawing or art work above referred to. The sheet 13 consists of a very thin piece of white paper which is placed over the surface of the drawing, particularly where the laminated structure is to be exposed, either as a wall panel or as a floor tile.

By the word "panel" as used in this specification and claims is included all types and shapes of sections useful in boxes, furniture, trays, table tops, cases, portfolios, book covers, bars, etc. The laminated sheets could also be made into three dimensional objects, as well as flat panels. By the expression "drawing" or "sketch" is included printed sheets as well as hand work, such as screen or cylinder printed sheets, or even photographic or photo-chemical reproductions.

Preferably the white backing sheet 11 should always be devoid of resin, so that dark colored core 10 will not affect color of drawing.

Where the drawing, art work, or photograph is reproduced or provided upon a sheet of plastic material, such as a sheet of regenerated cellulose, cellulose ether, cellulose nitrate, cellulose acetate, vinylite resin, urea formaldehyde resin, such sheet may be molded integrally into the laminated structure. The sheet of plastic material should preferably be substantially past B-state so that there would only at the most be incipient fusion at the surface, insufficient to distort or blur the desired outlines.

There may be processed by this invention any kind of a drawing, painting, design, pattern or re-

productions thereof. The final sheet product may be very thin to be formed into curved surfaces or molded three dimensional objects or very thick to be used for architectural or structural purposes.

To summarize, the present invention contemplates the making of decorative panels for walls, table tops, floors, etc., in which a plurality of sheets impregnated with a thermoplastic material are covered first with one or more white sheets, at least one of which may be unimpregnated with resin and at least one of which, if desired, may carry the drawing or the art work to be permanently mounted, upon which is then placed the drawing or the art work if it is not on one of said white sheets, and finally upon the top of the mass is then placed a thin thermoplastic impregnated cover or facing sheet. Finally, the entire mass of sheets are pressed together under heat and pressure so that the entire mass forms a substantially integral panel. If desired, a sheet of metal foil or film may be included below or in the white backing sheets above the base and the back of the panel so formed may be rough or abraded so as to enable its more ready mounting under pressure in the same manner as wood veneers.

By the expression "drawing" included in the accompanying claims is meant any sort of art work which may be placed on the top of any white backing sheets and above the base.

As many changes could be made in the foregoing processes, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A panel composed of a laminated backing sheet of resin impregnated paper, intermediate upper unimpregnated white backing sheet, a superimposed drawing to be mounted and a surfacing sheet, said sheets having all been united together by heat and pressure.

2. A laminated decorative panel comprising a drawing mounted between a resin impregnated backing having at its top at least one unimpregnated white backing sheet and a transparent upper surfacing.

3. A mounted drawing comprising a drawing upon a permeable backing, at least one unimpregnated white sheet in back of said drawing and a transparent sheet above said drawing and a base below said white sheet, said base being composed of a relatively large number of sheets of resin impregnated paper and the entire combination being united permanently by heat and pressure.

4. A method of mounting a drawing which comprises providing the drawing upon a permeable backing, placing beneath the drawing at least one unimpregnated white backing sheet and a laminated base consisting of a number of sheets of resin impregnated paper and placing above the drawing a thin transparent resin impregnated tissue and then subjecting the entire mass to sufficient heat and pressure to form a unitary panel.

5. A compressed thermoplastic impregnated panel composed of a plurality of laminations all of which have been impregnated and united by a thermoplastic material fused therein by heat and pressure, said panel being composed of lower

laminations consisting of relatively dark colored impregnated sheets of paper serving as a base, intermediate laminations composed of unimpregnated sheets of a light colored porous absorbent material, upper laminations consisting of art work carried by a porous penetrable sheet paper material and a surface lamination consisting of a thin sheet of transparent protective material.

6. A compressed thermoplastic impregnated panel composed of a plurality of laminations all of which have been impregnated and united by a thermoplastic material fused therein by heat and pressure, said panel being composed of lower laminations consisting of relatively dark colored impregnated sheets of paper serving as a base, intermediate laminations composed of unimpregnated sheets of a light colored porous absorbent material, upper laminations consisting of art work carried by a porous penetrable sheet paper material and a surface lamination consisting of a thin sheet of transparent protective material, said thermoplastic material being a urea resin and all of said laminations consisting of urea resin impregnated absorbent paper sheets.

7. A compressed thermoplastic impregnated panel composed of a plurality of laminations all of which have been impregnated and united by a thermoplastic material fused therein by heat and pressure, said panel being composed of lower laminations consisting of relatively dark colored impregnated sheets of paper serving as a base, intermediate laminations composed of sheets of a light colored porous absorbent material, upper laminations consisting of art work carried by a porous penetrable sheet paper material and a surface lamination consisting of a thin sheet of transparent protective material, and said panel also including an additional intermediate lamination of a sheet metallic material.

8. A compressed thermoplastic impregnated panel composed of a plurality of laminations all of which have been impregnated and united by a thermoplastic material fused therein by heat and pressure, said panel being composed of lower laminations consisting of relatively dark colored impregnated sheets of paper serving as a base, intermediate laminations composed of sheets of a light colored porous absorbent material, upper laminations consisting of art work carried by a porous penetrable sheet paper material and a surface lamination consisting of a thin sheet of transparent protective material, the thermoplastic material at the surface of the panel being harder than the thermoplastic material in the interior of the panel.

9. A compressed thermoplastic impregnated panel composed of a plurality of laminations all of which have been impregnated and united by a thermoplastic material fused therein by heat and pressure, said panel being composed of lower laminations consisting of relatively dark colored impregnated sheets of paper serving as a base, intermediate laminations composed of unimpregnated sheets of a light colored porous absorbent material, upper laminations consisting of art work carried by a porous penetrable sheet paper material and a surface lamination consisting of a thin sheet of transparent protective material, the thermoplastic material at the surface of the panel being of lighter color than the thermoplastic material at the base of the panel.

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