May 11, 1937. J. F. WALSH ET AL 2,079,641

CEMENTING CELLULOSIC PLASTICS

Filed Jan. 11, 1930

Fig. 1.

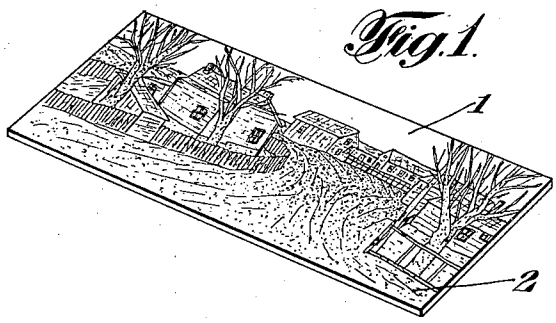


Fig. 2.

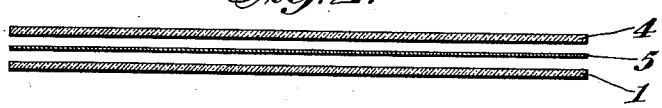


Fig. 3.

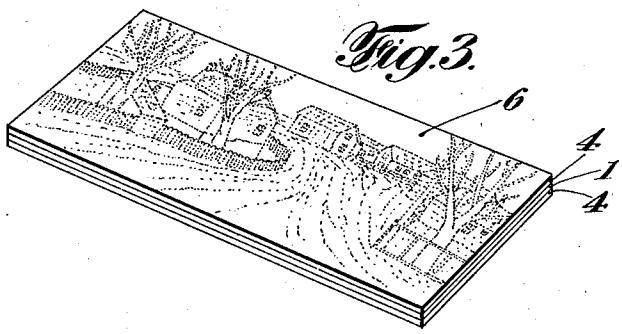


Fig. 4.

INVENTORS
JAMES F. WALSH
AMERIGO F. CAPRIO
BY
J. Seltzer & C. W. Levinson
ATTORNEYS

Patented May 11, 1937 2,079,641

# UNITED STATES PATENT OFFICE

2,079,641

## CEMENTING CELLULOSIC PLASTICS

James F. Walsh, South Orange, and Amerigo F. Caprio, Newark, N. J., assignors to Celluloid Corporation, a corporation of New Jersey

Application January 11, 1930, Serial No. 420,156

4 Claims. (Cl. 154—2)

This invention pertains to the general class of cements and particularly to the class of cements adapted for use in cementing cellulosic plastic materials.

Cellulosic plastic sheets, such for instance, as sheets made with cellulose nitrate or cellulose acetate are commonly used for veneering and compositing purposes, and designs, sketches, paintings, drawings, prints, etc. are often covered by the plastic.

In veneering and compositing operations volatile liquid solvents, or liquid cements containing volatile solvents, have generally been used between the surfaces to be joined. Such volatile liquid solvents or cements very often cause blushing, bubbles, and pockets between the composited parts and cause many colors to bleed or run, such as to produce very unsatisfactory results.

An object of our invention therefore, is to provide a cement which will not cause blushing, bubbles, or pockets and will not cause colors to run or bleed.

A further object of our invention is to provide novel means for veneering and compositing.

A further object of our invention is to provide a novel process for veneering and compositing.

A further object of our invention is to provide a novel veneered or composited product.

Many other objects and advantages will become apparent to persons skilled in the art as the specification proceeds.

In the drawing wherein like reference characters are appended to like parts throughout the various figures,

Figure 1 is a perspective view of a colored print.

Figure 2 is a section showing the parts in position ready for compositing the print shown in Figure 1 with a cellulosic plastic sheet.

Figure 3 is a perspective view showing the print composited with a cellulosic plastic sheet.

Figure 4 illustrates the position of the parts for compositing the print between two cellulosic plastic sheets.

Referring to the drawing wherein the parts are illustrated in somewhat exaggerated scale, the print 1 having a paper base, is shown for the purposes of illustration, having an outer colored surface 2.

Print 1 is to be composited with one or more sheets such as sheet 4 of cellulosic plastic. These sheets may or may not carry color, and are, of course, more or less pervious to light when covering parts which are to show through same.

It is assumed for the purposes of illustration that the color or colors of the print 1 have a tendency to run or bleed when the ordinary volatile liquid solvents or cements are used. To overcome this tendency of the colors to run or bleed, we use between sheet 4 and print 1, a cement 5 in sheet form comprising substantially non-volatile solvents for the cellulosic plastic, preferably combined with at least a small proportion of the particular cellulosic plastic. The presence of at least a small proportion of the cellulosic plastic is particularly preferred where the non-volatile solvents are of an oily nature, in order that the cement may be maintained in sheet or other solid form. The use of a proportion of the cellulosic plastic also aids in producing a final product which is substantially homogeneous throughout, except for the print or its equivalent.

For the purposes of this specification and claims, the term "solid" includes semi-solid and similar forms which are slowly mobile under pressure, and the term "bleeding" includes running, smearing, etc., and the tendency toward same.

The compositing operation is preferably carried on by first using heat and pressure in a press or its equivalent, and then cooling without completely removing the pressure. During this operation the cement 5 which may be relatively thin compared to sheet 4, and which is thermoplastic, becomes a part of sheet 4 and welds sheet 4 and print 1 securely together.

The cement 5 being more or less of a firm nature, does not absorb the color from the print sufficiently to cause a running or bleeding, nor does it flow during the compositing operation sufficiently to cause this effect.

Sheets 5 of cement may be made by any of the processes used in making cellulosic plastic sheets such as mixing of components, preferably with a volatile solvent and flowing on a film wheel, block pressing and sheeting, or extrusion through a die. The sheets 5 may be of any desired thickness. We have successfully used such sheets of cement ranging from 0.005 to 0.030 of an inch in thickness. The cement, of course, may be in any other than sheet form. The finished panel 6 may, of course, be polished or given a matt finish or otherwise processed by any means known in the art.

While we do not limit ourselves to any specific formula for a thermoplastic cement, we find the following produce very satisfactory results:

*Formula A*

| | Parts |
|---|---|
| Cellulose acetate (preferably of variety soluble in acetone) | 100 |
| Triphenyl phosphate | 10 |
| Paraethyltoluolsulphonamid | 25 |
| Dibutyl tartrate | 25 |
| Triacetin | 20 |

*Formula B*

| | Parts |
|---|---|
| Cellupose nitrate | 100 |
| Camphor | 60 to 90 |

*Formula C*

| | Parts |
|---|---|
| Cellulose acetate (preferably of variety soluble in acetone) | 100 |
| Tricresyl phosphate | 15 |
| Diethyl phthalate | 25 |
| Triacetin | 25 |
| Dibutyl tartrate | 25 |

*Formula D*

| | Parts |
|---|---|
| Cellulose nitrate | 100 |
| Camphor | 30 to 50 |
| Dibutyl tartrate | 30 to 50 |

The above formulae may be varied as desired and to suit practice, and other known plasticizers may be substituted for those given. However, we prefer not to go below 60 parts of plasticizer to 100 parts of cellulose derivative.

While the invention has been described with respect to compositing or veneering wherein either one or more sides of a color carrying member of any base may be covered with a cellulosic plastic, the invention of course includes any operation wherein a soluble, bleeding, or smearing color is cemented within a cellulosic plastic, as well as cementing cellulosic plastics themselves.

Other cellulose derivatives, besides cellulose nitrate and cellulose acetate, which may be utilized, are cellulose formate, cellulose butyrate, cellulose propionate, ethyl cellulose, benzyl cellulose, etc. Of these, we prefer the esters and particularly cellulose acetate. The manufacture of plastics from these materials is known in the art.

The term "compositing" as used in the specification and hereinafter in the claims is to be construed to mean uniting or combining sheets of the same or different materials.

Having described our invention it is obvious that many modifications may be made in the same within the scope of the claims without departing from the spirit of the invention.

We claim:

1. The process of joining objects at least one of which is a cellulosic plastic and at least one of which bears bleeding colors, comprising inserting a cellulosic plastic cement comprising at least 60 parts plasticizer to 100 parts of cellulose derivative between said objects and applying heat and pressure thereto to cement the same into an integral structure.

2. The process of joining objects at least one of which is a cellulose acetate plastic and at least one of which bears bleeding colors, comprising inserting a cellulosic acetate plastic cement comprising at least 60 parts plasticizer to 100 parts cellulose acetate between said objects and compositing the whole into an integral structure by means of heat and pressure.

3. A composite sheet of integral structure comprising a plurality of sheets at least one of which is of a cellulosic plastic and at least one of which bears bleeding colors, said sheets joined by means of a sheet of cellulosic plastic containing at least 60 parts plasticizer to 100 of cellulosic base between each pair of said first mentioned sheets.

4. A composite sheet of integral structure comprising a plurality of sheets at least one of which is of a cellulose acetate plastic and at least one of which bears bleeding colors, said sheets joined by means of a sheet of cellulose acetate plastic containing at least 60 parts plasticizer to 100 of cellulose acetate base between each pair of said first mentioned sheets.

JAMES F. WALSH.
AMERIGO F. CAPRIO.