Jan. 21, 1941. G. SCHNEIDER 2,229,225

CELLULOSE DERIVATIVE ARTICLE

Filed March 16, 1939

Fig. 1.

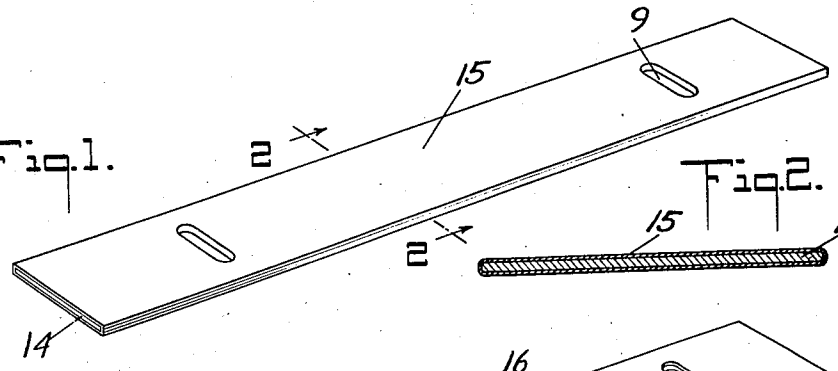
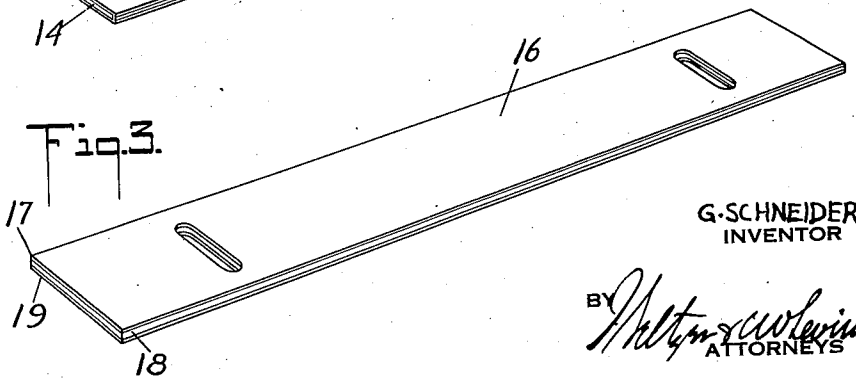


Fig. 2.

Fig. 3.



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CELLULOSE DERIVATIVE ARTICLE

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6 Claims. (Cl. 156—17)

This invention relates to the production of slats for Venetian blinds from compositions containing cellulose acetate or other organic derivative of cellulose material, said slats being more pleasing in appearance and more durable than conventional wooden slats.

An object of this invention is the production of slats for Venetian blinds from cellulose acetate or other organic derivative of cellulose material.

Another object of this invention is the production of slats for Venetian blinds which are translucent or transparent.

Another object of this invention is the production of slats for Venetian blinds which retain their shape and contour and which are easily cleaned.

A further object of this invention is the production of slats for Venetian blinds which are resilient and compact.

A still further object of this invention is the production of slats for Venetian blinds which are unaffected by moisture and which can be colored in sun-fast colors. Other objects of the invention will appear from the following detailed description and the drawing.

In the drawing, wherein like reference numerals refer to the same or similar elements:

Fig. 1 is a perspective view of a slat for Venetian blinds prepared in accordance with my invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; and

Fig. 3 is a modified form of novel slat for Venetian blinds.

Heretofore it has been customary to form slats or pulls for Venetian blinds from wood or strips of veneer. While these have been satisfactory to some extent they have not come into popular or wide spread use. This has been due to several factors such as cost, lack of durability, inflammability, difficulty in cleaning slats, warping of slats due to moisture or humidity and other objectionable features. I have now found that not only can these several disadvantages arising out of the use of wooden slats be eliminated or greatly minimized but also the decorative value of the blinds can be greatly enhanced.

In accordance with my invention I form the slats for Venetian blinds from organic derivatives of cellulose such as cellulose acetate. I have found that slats can be made from cellulose acetate economically and expeditiously. Such cellulose acetate slats have a uniformity which is well nigh unobtainable when making the slats from wood and, moreover, they can be obtained in a variety of colors or tints impossible with the conventional wooden slats.

The cellulose acetate slats of the present invention can be made in a variety of ways. Thus, they can be prepared by cutting the same from sheet stock of any suitable gauge or thickness into the desired contour and size. Cellulose acetate sheet stock having a thickness of from .025 to .038 inch have been found to give durable and strong slats but it is of course possible to use other thicknesses where desirable. Slats having a thickness of .025 to .038 have been found to possess sufficient body and rigidity to prevent sagging and to resist flattening or distortion upon exposure to sun or to the heat of radiators. Where slats of less thickness are used, it is advisable to reinforce the longitudinal edges of the slats with metal strips in order to impart rigidity and to prevent sagging or distortion.

The slats can also be made by hydraulically stuffing or extruding a cellulose acetate composition containing about 10 to 15% solvent in a powder press under suitable temperature and pressure conditions. Temperatures of about 200–230° F. and pressures of about 1000 pounds per square inch with a rate of extrusion of at least 25 ft. per minute have been found to give good results. It is possible, where it is desired to avoid seasoning, to extrude a dry, seasoned cellulose acetate composition at higher temperatures and pressures. For example, a stuffer-injection molding method may be utilized wherein the cellulose acetate molding composition may be preheated to the temperature of plasticity in a screw stuffer from which it is introduced directly into the extrusion cylinder so that little or no heating of the material in the cylinder is required. When the slats are formed by these methods they are flat but it is possible to mold the same to any other desired shape. This subsequent molding or shaping also serves to impart a smoother finish and greater strength to the slats.

Where the combination of extrusion and molding steps is utilized it is possible to extrude a cheap core or base and to composite and laminate it with a higher grade facing of veneer during the molding operation. This makes it possible not only to obtain a highly decorative slat at a comparatively low cost but makes possible the production of beautiful multi-colored effects and designs which are impossible with wooden slats. It also affords an outlet for low grade stock which it is not desired to utilize where it will be exposed to view or to the elements.

While it is possible to make the Venetian blind

slats of clear transparent compositions, it is preferred to utilize cellulose acetate compositions which contain pigments, fillers, effect materials and the like. The nature and the amount of pigment or filler added to the composition will depend on the effect desired. The following are examples of pigments which have been found to give good results: aluminum hydrate, amorphous diatomaceous silica, glass powder, titanium oxide, zinc oxide, talc and gypsum. Where a high degree of translucency is desired, the amount of pigment added will be comparatively small whereas substantial amounts of pigment are required where an opaque slat is required. Where a pearly luster is desired nacreous pigments such as fish scale, mercurous chloride and the like may be used. Where colored slats are desired suitable colored pigments may be incorporated in the composition or suitable dyes for the cellulose acetate may be used. The pigment also serves to act as a fire retarding agent in the composition.

The cellulose acetate composition preferably contains a suitable plasticizer to impart the necessary molding and shaping properties to the composition. The plasticizers should not be used in such amounts as might lower the rigidity of the slats and cause the same to sag in use. The plasticizers should preferably be employed in amounts varying from 20% to 50% on the weight of the cellulose acetate. Any plasticizer for the cellulose acetate can be used. The following have been found to give satisfactory results: the aryl sulphonamides such as para ethyl toluol sulphonamide, the alkyl phthalates such as dimethyl phthalate, the di-alkyl tartrates such as di-butyl tartrate, the alkoxy esters of polybasic organic acids such as diethoxy ethyl phthalate, the polybasic organic acid esters of the monalkyl ethers of polyhydric alcohols such as diethylene glycol ethyl ether ester of phthalic acid, the alkyl esters of phosphoric acid such as tri-ethylglycol phosphate, the aryl esters of phosphoric acid such as tricresyl phosphate and the mixed alkyl and aryl phosphates such as ethylglycol di-cresyl phosphate. Mixtures of two or more of the above may be employed.

Various modifications of the form of slat embodied in the invention are shown in the drawing.

Fig. 1 shows a form of novel slat made in accordance with this invention. This slat is composed of a core or base 14 surrounded by a layer or covering 15, said slat being provided with openings 9 for the passage of pull cords with which the blind is operated. The core or base may be of any desired material such as wood or metal or it may be a low grade composition containing cellulose acetate and substantial amounts of pigment. The outer layer or covering consists of a composition containing cellulose acetate which may be decorated or colored in any suitable manner or present any desired effect. This outer covering 15 may be extruded around the core or base 14 or it may be formed around the core in any other desired fashion.

A modified form of my novel slat may be made by laminating several layers of material into the form of a slat as shown in Fig. 3. In that figure the slat 16 is composed of three layers 17, 18 and 19. Layers 17 and 19 are of suitable cellulose acetate or other cellulose derivative composition united under suitable conditions of heat and pressure to the inner layer 18, which may also be a cellulose derivative composition or it may be any other desired material. Thus the inner layer may be made of wood, metal, wire screening, or even a fabric containing a colored design or pattern.

Where it is desired to form a slat of exceptional strength and rigidity, without having external metal reinforcements, metal reinforcing strips may be embedded in the cellulose acetate composition. This can be effected during the molding operation or if the slat is formed by extrusion, the cellulose acetate composition can be extruded so as to enclose or surround the metal strips. Unique effects can be obtained where the cellulose acetate composition is transparent or highly translucent and the reinforcing strips, in variegated shapes or forms, are visible therethrough. Where it is preferred to keep the reinforcing strips out of sight, an opaque cellulose acetate composition should be employed.

Venetian blinds made with the novel slats embraced by the present invention possess many advantages over those made with the conventional wooden slats. Thus, in accordance with my invention one may obtain slats of any desired degree of transparency or translucency from complete transparency to complete opacity. The novel slats of the present invention are substantially unaffected by moisture and are sun-fast, particularly when colored with pigments. My novel slats can moreover be obtained in almost any desired color and in addition retain their finish and appearance substantially permanently. The novel slats, due to their composition and method of manufacture, do not have any tendency to warp on usage nor are they prone to split or crack as are wooden slats.

While this invention has been described particularly in connection with cellulose acetate compositions, it is to be understood that the cellulose acetate can be replaced by other organic derivatives of cellulose such as organic esters of cellulose and cellulose ethers. Examples of such other organic esters of cellulose are, cellulose formate, cellulose propionate, cellulose butyrate or mixed esters such as cellulose acetate butyrate, cellulose acetate propionate and the like, while examples of cellulose ethers are ethyl, methyl and benzyl cellulose. The use of mixtures of esters and of ethers is also embraced within my invention.

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. A slat suitable for use in Venetian blinds, comprising a layer containing an organic derivative of cellulose, said layer having united to each side thereof an outer layer of an organic derivative of cellulose composition.

2. A slat suitable for use in Venetian blinds, comprising a layer containing cellulose acetate, said layer having united to each side thereof an outer layer of cellulose acetate composition.

3. A slat suitable for use in Venetian blinds, comprising a core of a composition containing an organic derivative of cellulose and pigment which is surrounded by an outer layer of an organic derivative of cellulose composition.

4. A slat suitable for use in Venetian blinds, comprising a core of a composition containing cellulose acetate and pigment which is surrounded by an outer layer of a cellulose acetate composition.

5. A slat suitable for use in Venetian blinds, comprising a textile fabric having a layer of an organic derivative of cellulose composition united to each side thereof, the assembly being provided with an opening near each end of the slat.

6. A slat suitable for use in Venetian blinds, comprising a textile fabric having a layer of cellulose acetate composition united to each side thereof, the assembly being provided with an opening near each end of the slat.

GEORGE SCHNEIDER.