May 2, 1939. S. J. JOHNSON 2,157,057

PROCESS OF MAKING WINDOW SHADES

Filed Aug. 19, 1936

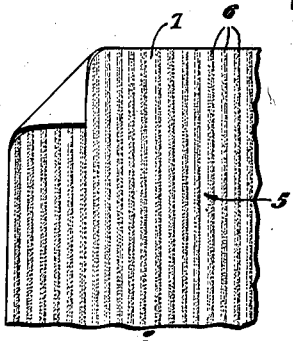


Fig. 1

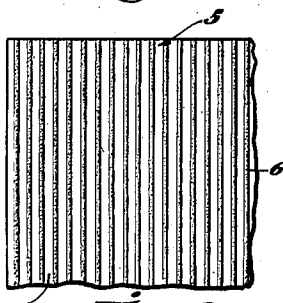


Fig. 2

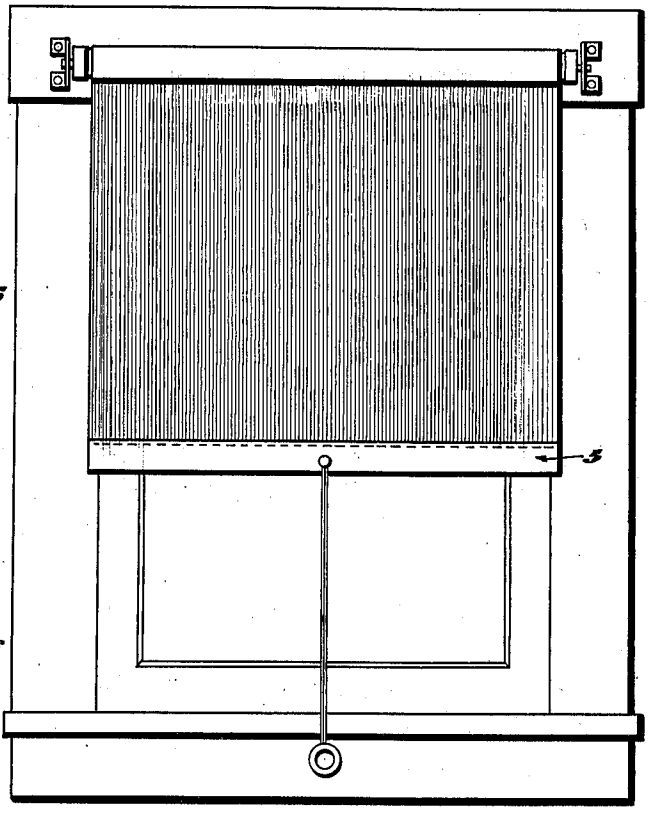


Fig. 5



Fig. 3

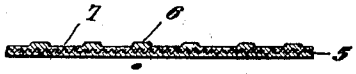


Fig. 4

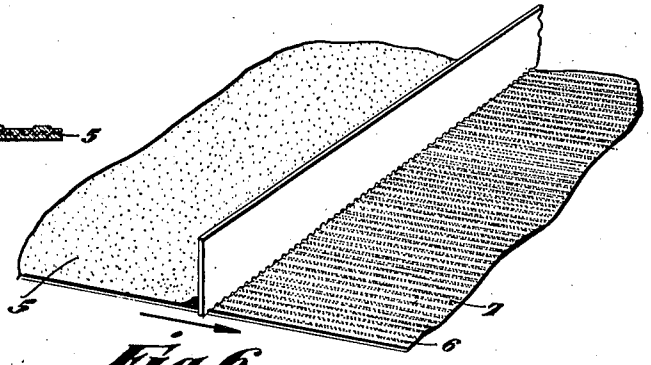


Fig. 6

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PROCESS OF MAKING WINDOW SHADES

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Application August 19, 1936, Serial No. 96,848

1 Claim. (Cl. 91—68)

This invention relates to window shades and to a method of making them. More particularly, the invention relates to window shade materials combining unusual ornamental and decorative effects with advantageous physical qualities, and also to a novel process by means of which these characteristics are provided.

In the past, one conventional method of coating window shades, particularly of the cloth variety, has included the use of doctor blades adapted to spread the coating composition uniformly over the shade surfaces. In such finishing operation, certain defects, hereinafter more fully discussed, have been imparted to the coatings. The present invention is predicated upon a purposeful multiplication of the conditions which heretofore have been characterized as difficulties inherent in the operation. By reason of the multiplication of these idiosyncrasies, the present invention provides a marked improvement in the structure and in the appearance of window shade sheeting.

The present invention has application to window shade materials both of the cloth, and of the paper variety, but, by reason of the fact that the concepts of the present invention differ appreciably from those heretofore recognized, a brief analysis of the art of treating window shade fabrics is requisite to understand fully the nature of the present advance.

It has been conventional in the past first to size and sometimes to pigment window shade fabrics, then apply the final coating either by hand painting or by machine. Hand painting operations inherently are expensive and tedious and the use of this method therefore has been limited.

In the particular machine coating operation, however, the coating composition is fed to the fabric while it is being passed continuously over or beneath a doctor blade adapted to spread the coating uniformly over the surface of the fabric, so as to leave a smooth final coating layer which is even in thickness. But the difficulty has been that tiny grits, fibres and particles of thread pigment and dirt catch at the smooth edge of the doctor blade only to scratch through the coating layer as the material leaves the blade. The foreign particles and threads thus leave longitudinal or striped depressions which mar and detract from the appearance of the otherwise smooth final film. If the color of the film coating happens to be different from that of the color of the base fabric then the color contrast only accentuates the defect. It is obvious that the presence of these streaks necessitates the rejection of the fabrics which are marred thereby. It is obvious also that serious economic disadvantages attend the important problem of waste which is present when streak defects are present.

It is the concept and determination of the present invention that the streak formations, which heretofore have been recognized only as defects in window shade sheeting, when established in continuous series across the width of a sheet, no longer comprise defects, but actually contribute to the decorative and ornamental effects of window shades made from such fabrics, and particularly to the physical qualities of the shades themselves. Otherwise stated, it is the concept of the present invention to constitute upon a window shade material a continuously cordurized coating, preferably superposed on a level coating of similar color.

According to the present invention the shade material if necessary or desirable, first is given a primary treatment such as with sizing or pigment, then the corduroy coating is established so that the surface of the shade presents the corrugated appearance of alternate ridges and valleys in spaced or heterogeneous, but preferably parallel relation over the entire surface area.

The invention therefore comprehends a base material either of cloth or paper, which carries at one or both surfaces thereof adjacent ridged streaks of coating composition which do not detract from the flexibility or pliability of the base material but which contribute to the decorative effect.

If the shade material intended to be processed according to the present invention comprises the usual shade maker's cloth such as muslin, then the material if desired first may be sized with a mixture of water and glue or other suitable sizing preparation, in the manner well understood in the art. On the other hand, if the base shade material comprises paper, it may be desirable to treat the paper in order to preclude curling thereof. In this respect, attention is invited to my copending patent application, Serial No. 755,311, filed November 30, 1930 for Window shade and process of making, in which I have disclosed a non-curling paper window shade and a process for impregnating the paper with a moisture retentive medium whereby the tendency of the paper to curl, as a result of being wound upon a shade roller, is obviated. On the other hand, it is not essential that paper be impregnated. The paper for example may be embossed either before or after the coating of the present invention has been

applied, in order to break the paper grain to prevent curling. It should be noted also that the liquid components in the coating likewise function to reduce the tendency of paper to curl.

After a given shade material has been treated primarily to adapt it to use in window shades, the material is subjected to the corduroy coating process of the present invention. In this process stripes or streaks of coating composition, preferably in parallel relation, are established upon the sheeting surface. In one aspect these stripes or streaks comprise the converse of the streaked depressions which formerly were imparted to the coatings of shade materials by the foreign substances caught at the edge of the doctor blade. On the other hand, however, the depressions intermediate the stripes or streaks established in the practice of the present invention correspond to the prior depression defects. In any event, a pleasing corduroy effect is accomplished by reason of the corrugated relationship of the ridges and valleys.

In practicing the present invention I have determined that the intended surface effect can be accomplished most conveniently, simply by notching the smooth edge of a doctor blade of the type used in the past or a knife which has a substantial thickness at the finishing edge. The notching in the blade permits the coating composition to pass therethrough to establish corduroy ridges on the sheet being coated, while the "teeth" portions of the blade prevent the passage of coating composition and thus correspond with valleys in the corduroy surface.

The configuration of the notches obviously may be adjusted to suit any particular streak pattern desired, and likewise the spacing of the notches in the blade may be adjusted to provide desired ornamental effects. For example, a highly pleasing effect is provided when the notches are relatively closely spaced non-uniformly or heterogeneously along the edge of the doctor blade. On the other hand, if it is desired to provide a window shade which simulates the visual appearance of cloth shades in which bands of pin stripes are woven into the fabric, then the spacing of the notches along the edge of the doctor blade may be adjusted to a corresponding relationship. A series of notches at spaced intervals may be provided to accomplish the effect of banding.

Usually a given sheet of shade material is finished to the final condition in a single passage past the doctor blade. Thus the sheet itself may be coated with streaks or stripes superposed and projecting from superficial coating or, if desired, the sheet may be caused to be pressed relatively tightly against the edge of the doctor blade or knife during the coating operation, so that coating composition is applied only at the localities corresponding with the notches in the blade, leaving the base material exposed at the depression localities. Intentional contrasts in color appearance thus may be provided.

Any suitable coating composition may be used successfully in the practice of the present invention. It will be understood, of course, that a given coating material is applied most easily in liquid form, but the liquid should neither be watery nor too thin to retain the configuration which is imparted in the coating process. It is preferred that the coating material be thick enough to retain its given configuration long enough to permit the layer to be dried. The composition should not be too thick because of difficulty in obtaining unformity in the streaking. To assist the skilled in the art in the practice of the invention the following formula is provided as an example:

Water	pounds	200
Kaolin clay	do	200
Boiled linseed oil	do	150
Lithopone	do	75
Naphtha	gallons	10
Ammonia	quart	1
Pigment ground in linseed oil	pounds	12
Manganese drier	per cent	1½–2

Othe inert fillers may be used in place of the kaolin clay. Boiled China-wood oil, boiled fish oil, or other drying oils may be substituted in whole or in part for the boiled linseed oil. In place of the lithopone, white lead or titanium oxide may be used. In place of the naphtha, tolulol or other volatile coal tar or petroleum distillates may be employed. The pigment ground in oil may be selected from the well-known mineral pigments, the exact quantity used depending upon the color strength of the specific pigment and the desired color of the finished shade.

According to this example the bodies are mixed in a crude emulsion or suspension and applied in that condition before there has been time for any of the ingredients to settle out. The proportioning of the components is not highly critical. The selection of specific ingredients and the proportions in relation to the type of material being treated, the type of coating machinery being used, and the type of drying apparatus available are well understood by those skilled in the art. It will be understood also that types of coatings other than the emulsion type suggested, also may be used.

After the material has been coated in accordance with the present invention with the coating material, it preferably is heated to a temperature of about 90 to 150° F. for a period of about one and a half to two hours. The exact times and temperature must, of course, vary in accordance with the precise nature of the ingredients constituting the coating and the finish.

From the point of view of the interior decorator, the product of the present invention is unique by reason of the fact that the corduroy is accentuated when the shade material is exposed to light. At the localities which correspond to the streak formations the shade is more opaque (due to the greater thickness of coating).

By reason of the fact that the stripes of coating composition render the shade more opaque to light at these localities the shading effect of the material of the present invention, in respect to the intensity of illumination, is notably improved over that provided by the old evenly coated shade fabrics. The light passing through the irregular coating is highly diffused.

However, an unusual "body" or feel is imparted to the shade by reason of the structure described. The localities corresponding to the valleys or furrows intermediate the ridges are flexible and pliant particularly in the direction of the streaks. At these areas the shade essentially comprises only the thickness of base material with or without a thin coating layer. While light is transmitted somewhat more freely through the furrow areas, the greater opaqueness at the ridge localities more than offsets the difference through the diffusion function of the coating corrugations.

Moreover, from the point of view of physical

quality several important characteristics are provided. The streaks of coating composition appreciably strengthen the shade in the direction transversely of the streaks. Thus, if the streaks run longitudinally, it is vertically impossible, by ordinary handling, to tear the shade in the crosswise direction in which shades of conventional structure most frequently are torn. But it will be understood, of course, that the streaks of coating composition may extend crosswise as well as longitudinally of the "horizontal" mode of decoration is desired. The structure, in substance provides a shade material which has great body and strength without great weight.

On the other hand, the parallel longitudinality of the streak formations affords a structure which is conformable readily to rolling on a window shade. The usual tendency of shades to roll up crookedly is obviated.

In the drawing:

Figure 1 illustrates the appearance of the shade when it is disposed against a non-luminous surface.

Figure 2 shows the accentuation of the corduroy effect when light is passed therethrough.

Figure 3 is a cross section through a paper shade corduroy coated.

Figure 4 is a cross section through a cloth shade coated and corduroy coated.

Figure 5 illustrates the appearance of my shade disposed on a window.

Figure 6 illustrates the manner of corduroy coating shade material.

In the drawing, the base material is represented at 5, the streaks of coating are represented at 6, and the depressions intermediate the streaks at 7. The doctor blade 8 in the drawing is notched in the manner adapted to provide one form of striping pattern illustrated in Figure 1.

The corduroy coating of the material of the present invention minimizes the appearance of dirt on the shade. The preferred product is strong, highly flexible, difficult to tear and readily washable. The quality of washability, of course, is somewhat a function of the type of coating material used, but if the formula suggested be employed, the shade may be washed with a brush and water without impairing its appearance by detracting from its opaqueness in respect to light transmission, even though paper base material be employed.

The claim of this application is directed to the process of making window shades. Claims directed to the product disclosed herein appear in my copending application, Serial No. 136,846, filed April 14, 1937.

Having described my invention, I claim:

The method of making paper window shades, which comprises, distributing a quantity of coating material upon a continuously passing paper web which does not possess the tendency to curl when it is dry, so as to obtain a plurality of doctored streaks of the coating material in parallel, relatively closely spaced, but heterogeneous relationship, the streaks disposed upon the web being of substantial thickness and collectively providing a corduroy-like surface, and then drying said coating on said web.

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