Feb. 14, 1933. C. L. KELLER 1,897,198

PAPER BOARD

Filed June 27, 1927

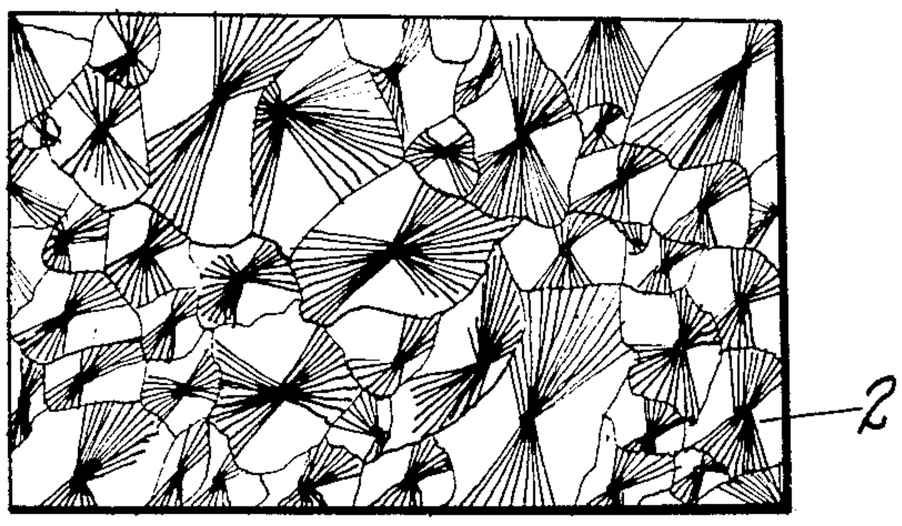

Fig 1

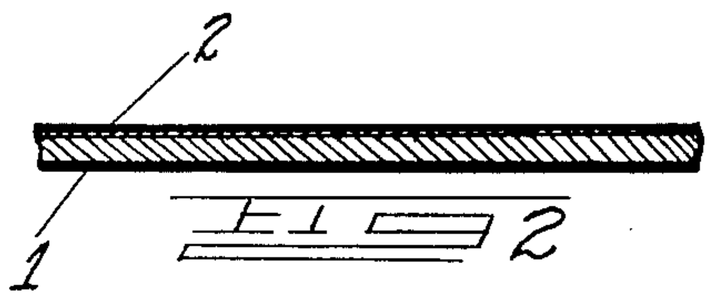

Fig 2

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UNITED STATES PATENT OFFICE

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PAPER BOARD

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My invention relates to the production of a paper board, particularly box board, having a coating thereon of great thinness which is applied after the board is made, and which imparts to the board not only an attractive appearance, but also gives to it bending qualities.

The appearance factor of my improved paper board lies in the use of a surfacing material, in a very thin coat, which contains a substance that will give a striking crystalline effect, which will obscure any faults in color or coating of the paper board, and largely eliminate the effect of blemishes. The strength factor of my improved board lies in the use of a cellulose lacquer in a very thin coat, which gives bending qualities to the board due to the fact that the lacquer is very flexible, and prevents the board from cracking when bent.

My invention is of great economic value in many ways. For example, in the construction of large, inexpensive boxes, particularly for dry cleaners, clothing dealers and the like, where the boxes must have a large area, and be shipped knocked down, the large expanse of surface whether color coated or not will be likely to include appearance defects, which, if small sized blanks were cut from the strip of paper board would not be so apparent; and the setting up of the boxes, whether scored or not, will be likely to crack the board along the line of fold of the tabs and tongues. By my invention I am enabled to employ a cheap grade of board in light weight, without expensive outer layers and without costly printing to supply this type of box, and still give a very satisfactory product of high appearance value, and superior in bending qualities to grades of board which are much more expensive to make than the cost of my board plus the coating.

I accomplish my objects by that certain construction to be hereinafter more specifically pointed out and claimed.

In the drawing:—

Figure 1 is a plan view of a piece of board, showing the novel lacquered surface.

Figure 2 is a section showing in exaggerated form the thickness of the board and of the layer of cellulose lacquer.

I have indicated a piece of paper board having the body 1, and the coating 2. The coating consists of a very thin layer applied with a roll and doctor, a printing roll, spraying and doctoring, or in any other desired way, which lacquer is thin and contains in its composition some substance which will crystallize so that the lacquer will solidify in the form of crystals. Lacquer of this type can be given a wide range of color from the darker to the more delicate shades of all colors, and the crystalline structure can be varied by nature of the added constituent and by the mode of drying. Thus, a rapid drying of the board under heat will give a different effect than a slower drying without so much heat, or without heat.

Lacquers of this type having crystalline mode of solidification are on the market. The Dupont Company, for example, makes such a lacquer. Also crystallizing substances have been used in connection with paints and varnishes, the resultant appearance being imparted due to the fact that the crystalline substance builds up a surface which resembles a cross section taken through a solid crystalline body. As an example of a lacquer which may be used for this purpose, a cellulose lacquer body to which salicylic acid has been added, with or without coloring substances, will serve.

The board so coated can be scored, or it can be scored before it is coated, or left unscored in making up box blanks, or for other uses. The crystalline additions, usually organic in nature, tend to some degree to lengthen the time of drying of the coating, so that the penetration of the lacquer is increased thereby. I find it valuable to give some more penetration than would be permitted with the most rapid dryers among the cellulose solvents, in order to get enhanced strength characteristics.

The bending qualities of the board are dependent upon the nature of the pyroxylin or other cellulose product, which is quite tough and resilient, and irrespective of the appearance resulting from the crystalline effect, the

use of lacquer by itself, in a thin layer on paper board, is of great value, particularly in the box art, because of permitting cheaper grades of board to be given highly enhanced bending charactersitics at relatively small expense and with little increase in weight, as compared to the production of board having like qualities but made from other ingredients and in a more expensive way.

Irrespective of the enhanced bending qualities, my novel coated board will have an appearance which largely obscures irregular colors, blotches and the like, appearing in the natural product, since the coating is quite striking in its appearance, even though it be so thin as to be partially transparent, and the crystalline surface will so attract the eye as to obscure irregularities, even though by close inspection they will be discovered.

Also in color coated paper board, where the coating is thin and applied with the greatest economy, the regularity of the coating, while often sufficient for small sized boxes, is frequently not good enough for a box of large area, such as a suit box. A top coating of the crystalline lacquer over the under coat of color will give much enhanced effects, and obscure the irregularities of the under coating. Furthermore, the crystalline effect is one which is sufficiently broken up and often irridescent enough itself in appearance, to avoid showing up any defects in the application of the lacquer which contains the crystallizing material.

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

1. That method of protecting poorly bending box board from cracking at the score lines, which consists in coating said box board, at the score lines, at least, with a tenacious layer of a flexible substance.

2. That method of protecting poorly bending box board from cracking at the score lines, which consists in coating said box board, at the score lines, at least, with a layer of cellulose lacquer.

3. Non-bending box board having a tough and elastic surface coating of cellulose lacquer bonded to the surface fibers whereby said box board may be scored and bent without cracking.

4. Non-bending box board having a tough and elastic surface coating of cellulose lacquer bonded to the surface fibers whereby said box board may be scored and bent without cracking, said cellulose lacquer having a crystalline characteristic whereby the blemishes in the face of the board are obscured.

5. A method of producing a box with sound score lines from poorly bending box board, which comprises coating so-called non-bending box board with a thin layer of a flexible cohesive and strong coating substance, afterward scoring said box board and bending it to form a finished article.

6. A method of making boxes with sound scores from poorly bending box board, which comprises treating so-called non-bending box board with a cellulose lacquer to produce a thin superficial layer of lacquer thereon, and afterward scoring said box board and bending it to produce a finished article.

7. A method of producing attractive boxes with sound scores from poorly bending box board with box board having surface blemishes, which comprises coating non-bending box board, having a relatively unsightly surface, with a cellulose lacquer having a crystalline formation and sufficient opacity to obscure said surface blemishes, afterwards scoring said box board and bending it to form the finished article.

CHARLES L. KELLER.