Feb. 16, 1937. C. C. COLBERT ET AL 2,071,025

IDENTIFIABLE CARTON BOARD

Filed March 10, 1934 2 Sheets-Sheet 1

Fig. 1.

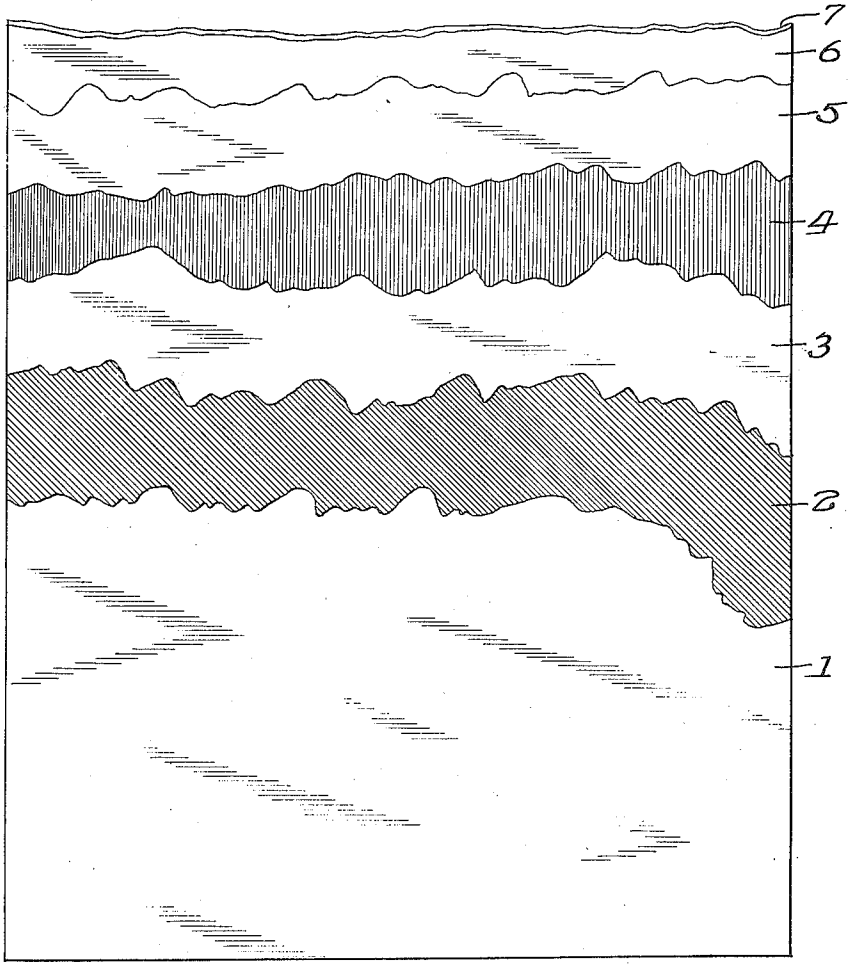
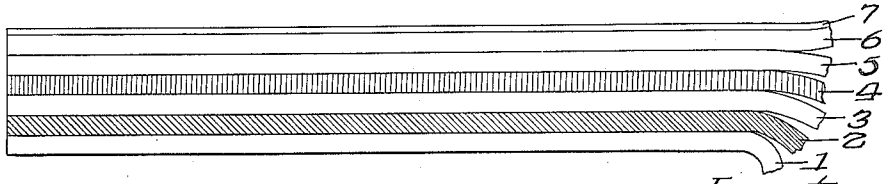


Fig. 2.



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Fig. 3.

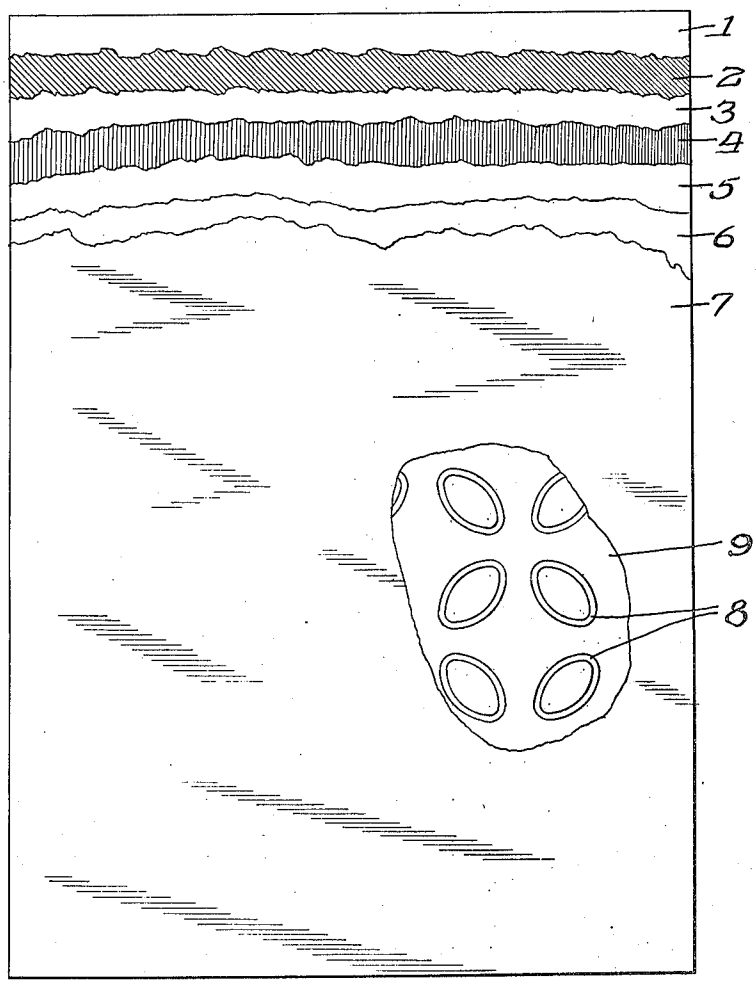
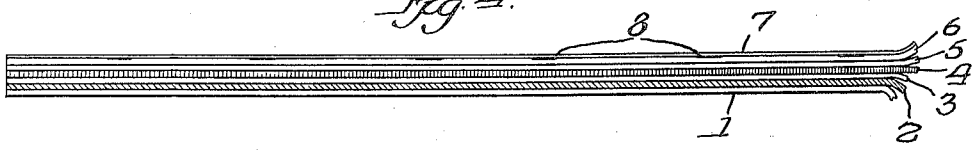


Fig. 4.



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Patented Feb. 16, 1937 2,071,025

UNITED STATES PATENT OFFICE

2,071,025

IDENTIFIABLE CARTON BOARD

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Application March 10, 1934, Serial No. 714,912

1 Claim. (Cl. 92—39)

This invention relates to coated paper board for cartons and the like of such character as to permit identification of cartons by reference to a characteristic of the board. According to the invention, the board is made in such manner as to provide an identifying characteristic by a color combination incorporated in the board in the process of manufacturing, the product being inimitable in the sense that it cannot be duplicated except by manufacture from the wet stock. In practicing the invention, the board is made with different specific color combinations for different individual carton users, the object being to provide for any individual carton user paper board of such individual and inimitable character that the cartons made therefrom can be identified independently of the label or printed matter on the exterior faces of the carton, wherefore counterfeits of such cartons can be detected. In a more specific aspect, the invention contemplates the production of coated paper board having an identification characteristic provided by color in combination with concealed or obscured identification marks.

The invention will be described by reference to illustrative samples of paper board made in accordance with the invention and shown in the accompanying drawings.

In said drawings,

Fig. 1 represents a mutilated piece of paper board embodying the invention, looking at the back side of the board and showing the same mutilated by stripping portions of the paper laminations of the board one from another.

Fig. 2 represents an edge view of a cut fragment of the board on a magnified scale.

Fig. 3 is a face view of a piece of coated paper board embodying the invention, mutilated in a manner to expose portions of the different paper laminations of which it is composed, and represented as having a splotch of water thereon to render apparent certain normally concealed or obscured identification marks.

Fig. 4 represents an edge view on a magnified scale of a cut section of the board represented in Fig. 3.

The illustrated product comprises a laminated sheet of paper material having an identifying characteristic comprising layers of distinctive color between the surface layers of the board. In the drawings the several layers or plies of paper of which the board is composed are designated by the numerals 1 to 6, inclusive, the layer 1 being the back liner, and the layer 6 being the front liner which is coated with clay coating solution or the like providing the external surface on which is adapted to be printed or lithographed the labels and advertising matter to appear on the exterior faces of the cartons. Usually the intermediate layers of the board 2, 3, 4, 5 are made from cheap stock such for example as ordinary newspaper stock obtained from old newspapers and the like, while the front and back liners are made from relatively superior stock. For example the front liner which is to be coated may be made from white sulphite stock while the back liner may be made from manila or kraft paper stock for strength. All the intermediate layers are made from the same or like stock, except that the layers 2 and 4 are distinctively colored, in this instance green and red. The board may be made on any suitable board making machine by collecting, super-imposing and binding a plurality of wet paper plies, films or layers to form a unitary sheet, the stock supplied to the forming cylinders of the machine which form the plies 2 and 4 being colored. The stock for the colored plies may be colored in the beaters by introducing in the beaters coloring matter or dye stuffs commonly applied for producing colored papers, but we have found it desirable to introduce the color in the regulating box in which the previously prepared and refined stock is diluted with regulated quantities of water, the coloring material being preferably incorporated in the water to be mixed with the stock. For example, assume the stock for all the intermediate plies of the board to be prepared from ordinary newspaper stock in the same beater, while the stock for the front and back liners is prepared in separate beaters. From each of the several beaters the stock passes into a storage reservoir in which it is mixed with a regulated quantity of water and stirred by means of agitors. From the respective reservoirs the stock is circulated through refiners or Jordan engines and discharged into stuff chests. From the several stuff chests the stock is pumped to a corresponding number of compartments in a regulator box and from the several compartments stock in regulated amounts is conducted into other compartments or troughs corresponding in number to the number of forming cylinders of the board making machine where the stock is diluted with the proper quantities of water in which the coloring material or dye stuff is incorporated. For instance the stock for the back liner is conducted from the receiving compartment of the regulator box into a trough where it is diluted with the proper quantity of water and thence conducted

through a strainer or strainers to the head box of the first forming cylinder of the board making machine. The cheap stock for the intermediate layers of the board is conducted from the receiving compartment of the regulator box into a series of troughs corresponding in number to the number of forming cylinders of the board machine which are to form the intermediate plies of the board. In these troughs the stock for supplying the intermediate cylinder of the board machine is diluted with the proper quantities of water, and in the water which is supplied to the stock for forming the layers **2** and **4** of the board the coloring matter is included. The said troughs conduct the stock through strainers to the head boxes of the several intermediate cylinders of the board machine. The stock for the front liner is likewise discharged from the receiving compartment of the regulator box into a trough, diluted with the proper quantity of water and conducted through a strainer to the head box for the last forming cylinder of the board machine. The coloring matter may be supplied to the water for dilution with the stock for the layers **2** and **4** by feeding dye liquid to said water or into the troughs in which said water is introduced. The dye liquid may be produced by dissolving in water suitable coloring matter or dye stuff. A variety of dye stuffs are known to the art which are furnished in powdered form, particularly the so-called aniline dyes or coal tar colors. Suitable dye liquid may be produced by dissolving aniline color powders in water in the proportion of about 2½ gallons of water to two ounces of the coloring matter. Although the stock produced for the intermediate layers of the board is often of a dirty or grayish color, due to the ink contained in the old newspapers and the like from which it is produced, such stock will nevertheless become brightly and distinctively colored by introduction of dye liquid in the manner indicated. This method of coloring the stock is found to have advantages over the introduction of color in the beater. In the first place it permits the stock for all the intermediate layers of the board to be obtained from stock obtained and prepared in the same beater. Aside from this, it reduces or minimizes the bleeding or running of the color from one sheet of the board into the next. It is found to be advantageous to color the stock shortly before its introduction to the board making machine, by pouring or feeding the dye liquid into the water for dilution of the stock in the regulator box as aforesaid. The pulp fibers taking up the color when so introduced are sufficiently and effectively colored but are apparently less saturated with color than when the color is introduced in the beater, or at any rate for some reason the colored layers of paper when produced in this manner are less liable to produce running and intermingling of colors. By separating the two colored layers **2** and **4** by intermediate layer **3**, the two colored layers are kept distinct.

Coated paper board embodying the present invention is made by the inventors under United States patents to Colbert and Preston No. 1,514,439 of November 4, 1924 and No. 1,903,325 of April 4, 1933, to which reference may be made for detailed disclosure of the coating process and incidental treatment of the board. As disclosed in the first mentioned patent coated paper board is manufactured by making the board of wet stock on a board making machine and performing a succession of operations on the board sheet delivered from the machine for production of the finished coated product without reeling the board between successive stages of manufacture, whereby the product is produced with a great saving of time, labor and expense and with minimum opportunity for damaging the board. The process of said patent includes calendering the surface of the board to be coated, and finishing the coated surface of the board by super-calendering, thereby producing a fine finished coated product suitable for printing or lithographing on the coated surface. By the process disclosed in said second mentioned patent the board is coated with a clay solution which may be white enamel, china clay or the like, with or without coloring pigments, the coating being performed in two operations by first applying to the calendered surface of the board a thin or light coat of the solution, drying the same, and then applying and brushing a second coat of the solution on the pre-coated surface, the solution for the two operations being the same in composition and color except that the solution for the first operation is thinner or more dilute than that employed for the second operation. This method of coating has marked advantages contributing improvement in the quality and uniformity of the coated surface of the board, as well as to increase speed and economy in the manufacture of coated paper board on a large commercial scale. The board may be coated with a solution of clay or clay and casein, with or without aniline coloring matter, and the coating solution may contain suitable percentages of sizing or other materials.

Paper board embodying the invention may be made in various numbers of paper plies and with various different specific color combinations. Ordinarily the layers other than the colored layers are of the ordinary or natural hues of the stock from which they are formed, while the distinctive layers are colored by coloring matter. By forming the board with a plurality of distinctively colored intermediate layers of different colors contrasting with each other and with the other layers, a multi-colored effect is attained which is a highly desirable identifying characteristic, and which may be embodied in various different styles for different carton users.

In a more specific aspect the invention contemplates the provision of coated paper board having a dual identifying means comprising a color characteristic as previously described in combination with concealed or obscured identification marks. For example the paper board illustrated in Figs. 3 and 4 is similar to the sample described with reference to Figs. 1 and 2, except that the surface of the front liner **6** before application of the coating material **7** thereto is printed with identification marks **8**, or with any identifying pattern or design on the surface of the board, such identifying marks or identifying marking being masked by the applied coating material so as to be non-apparent or invisible or only faintly visible, and to be rendered visible or more visible by wetting the coating surface of the board. For instance assuming in Fig. 3 that the identification marks are completely obscured or concealed by the applied coating, the same may be revealed by wetting the coated surface. In Fig. 3 a splotch of water on the coated surface of the board is indicated at **9**, revealing the identifying marks.

In producing paper board of the character disclosed in Figs. 3 and 4 the board after it has been made on the board making machine and calendered can be passed through a printing press com-

prising a printing roller or plate roller equipped with stereotyped plates and coacting with an impression roller, the plate roller being inked by suitable inking rollers to which ink is applied in any suitable manner.

If desired, paper board of the character disclosed in Figs. 3 and 4 may be made with identification marks which are faintly visible through a clay coating of white or light color, such board presenting a fanciful external appearance, while the identification characteristic provided by the colored layers is concealed, to be ascertained by tearing a piece of the board and examining its edge or stripping the layers one from another. This type of board affords an excellent safety means to prevent successful counterfeiting of cartons.

If desired paper board embodying the invention may be made with concealed or obscured identification marks applied in the manner disclosed in the copending application of Colbert et al., Serial No. 712,946, filed February 26, 1934. Such board may be made with identification marks printed on the board layer next the back layer and either wholly or partially obscured by the said back layer.

The term "paper board" is to be understood as including any laminated paper sheet made by collecting films or layers of pulp and superimposing them one upon another and bonding them together to form a unitary plural ply sheet suitable for making cartons and the like.

What we claim as our invention, and desire to secure by Letters Patent, is:

As a new article of manufacture, the product comprising multi-ply paper board having its layers bonded by inter-felted fibers and having between its front and back layers a plurality of artificially and differently colored layers, the front layer of the board being of relatively fine white or light colored stock and coated on its front side with white or light colored clay coating material providing an opaque surface adapted to be printed upon, said front coated layer being separated from the nearest artificially colored layer by an interposed layer of natural stock color, and adjacent artificially colored layers being separated from each other by an interposed layer of natural stock color, the colors of said artificially colored layers sharply contrasting with the colors of all the other layers.

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