May 5, 1925. 1,536,801

H. S. LABOMBARDE

METHOD AND APPARATUS FOR PREPARING COATED BLANKS FOR CONVERSION INTO BOXES

Filed Aug. 29, 1924

Fig. 2.

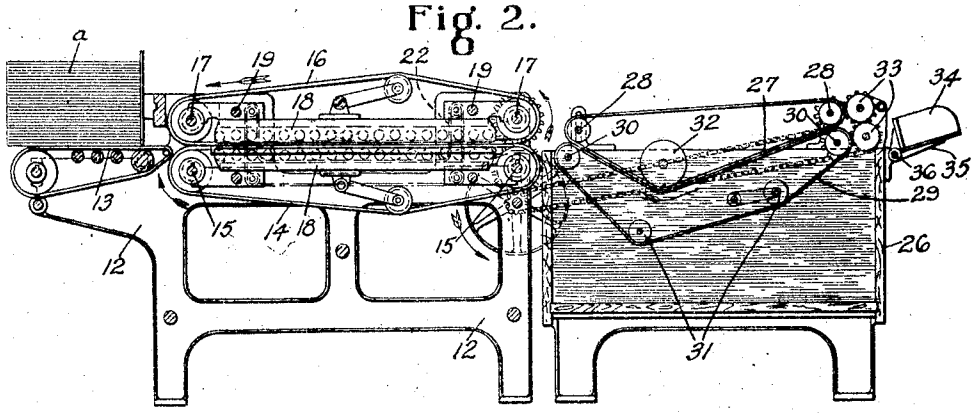


Fig. 1.

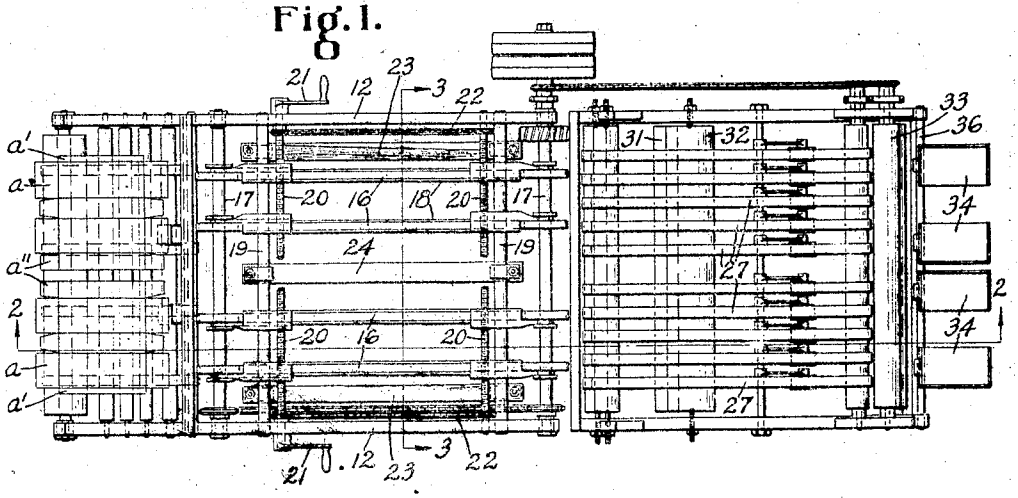
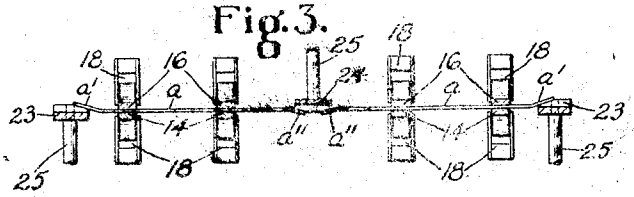


Fig. 3.



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Patented May 5, 1925. 1,536,801

UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR PREPARING COATED BLANKS FOR CONVERSION INTO BOXES.

Application filed August 29, 1924. Serial No. 734,870.

To all whom it may concern:

Be it known that I, HAROLD S. LABOMBARDE, a citizen of the United States, and resident of Nashua, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Methods and Apparatus for Preparing Coated Blanks for Conversion Into Boxes, of which the following is a specification.

This invention relates to the production of moisture-proof paper boxes, and refers particularly to the treatment of wax-coated flat blanks to prepare them for conversion at any later time into boxes having adhesively-secured lapping portions.

A desirable procedure in the manufacture of moisture-proof paper boxes is to first coat both surfaces of the entire blanks, prior to folding them, with wax usually paraffine. Such coating, as is well known, renders it quite difficult to glue the lap joints or flaps together when the blanks are folded to box form, because the wax prevents the glue which is preferably employed from adhering to the overlapped surfaces of the blanks.

Attempts have been made to remove sufficient wax from the portions of the blanks which are to be glued together, by a kind of scraping or cutting action, but the tools employed for such purpose soon accumulate an objectionable quantity of the wax which interferes with successful use of such tools for any practical length of time.

Other attempts to attain the desired removal of the wax have included the removal or driving off of a substantial portion of the wax by the application of heat to the portions of the blanks which are to be glued together, glue being immediately applied to those portions and the blanks folded and the glued surfaces pressed together while said portions are still heated. The result is that the outside of the boxes show streaks of discoloration along the lapped glued joints, this being due to the heat being transmitted through the paper. Such transmission of the heat not only renders those portions darker than the rest of the paper, but also dulls the outer surface of the joint so that it is far less glossy than the rest of the box.

The principal object of the present invention is to produce waxed paper boxes which have uniformly waxed outer surfaces, showing no dull or darker streaks or areas where glue is employed.

Another object is to so prepare the blanks that any desired quantity of them can be made ready and piled or stored until such time as any suitable or preferred folding machine is ready to have such prepared blanks fed to it, thereby avoiding any cutting down of the speed of the folding machine which, usually, is a far more expensive machine than anything required to prepare the blanks. Some folding machines have an operative speed of production of more than 50,000 an hour, but waxed blanks can not be successfully heat-treated at any such speed.

In the accompanying drawings I illustrate mechanical features of my invention, which features may be employed in carrying out my improved method. Of said drawings:

Figure 1 is a plan view of the machine.

Figure 2 represents a section on line 2—2 of Figure 1.

Figure 3 represents a section on line 3—3 of Figure 1 on a slightly larger scale and omitting some of the parts shown in Figures 1 and 2.

Similar reference characters indicate similar parts in all of the views.

At one end of a suitable frame 12 is a hopper for a pile of blanks *a* which are fed from said hopper singly and successively by feed belts 13. As the blank feeder may be of any suitable or preferred type, details thereof are unnecessary herein. From the feeder the blanks pass to and are carried by lower carrier belts 14 mounted on pulleys carried by shafts 15, and upper carrier belts 16 mounted on pulleys carried by shafts 17. The coacting stretches or runs of the upper and lower belts are guided by small rolls carried by cage bars 18, said bars being mounted on tie rods 19 and laterally adjustable thereon as by means of screws 20 having crank handles 21.

The machine illustrated is a duplex one, and thereby possesses certain advantages hereinafter explained, said advantages being more than merely the effecting of twice the production of a machine capable of car-

rying through only one row or succession of blanks. By referring to Figures 1 and 3 it will be seen that there are two feed hoppers, side by side, and that there are two pairs of lower belts and upper belts and roll cages. Therefore there are two sets of adjusting screws 20, those of each set being arranged to be simultaneously and equally operated by means of chains 22 connecting sprockets carried by the screws. This is to enable either one of the two machine units to carry blanks of different sizes. This general type of adjusting mechanism is similar to what is commonly employed in box folding machines and therefore needs no further description.

When the blanks to be operated upon are known as high-glossed blanks, carrying a heavy coating of wax on the surfaces, some of the wax is to be removed from one surface of the flaps a' and from the other surface of the margin a'' at the opposite edge of each blank. When the blanks are but lightly coated with wax it may be sufficient to drive the wax below the surfaces referred to instead of entirely removing it. To effect this I employ two elongated heating units or elements 23 adjustably mounted on the tie rods 19, in position to contact with and act on the under surfaces of the flaps a' of the two rows of blanks being fed through the machine (Figs. 1 and 3), and a single heating unit or element at the mid-width of the machine to simultaneously contact with and act upon the upper surfaces of the adjacent margins a'' of the same two rows of blanks. This feature of the machine enables three heating units or elements to act upon four different portions of the blanks. The long strips 23, 24, may include suitable electrical heating members or may be steam or air heated. In Figure 3 the members 25 may be simply supporting posts or may be conduits for electrical wiring or for steam or hot air.

The blanks are fed rapidly along by the belts and are delivered into a water tank 26 before the heat to which single surface portions of the blanks are subjected has time to penetrate through the stock to the other surfaces of those portions, the water in said tank being, of course, cold.

To ensure practically instantaneous submersion of the blanks below the surface of the cold water, I employ upper belts 27 mounted upon rolls carried by shafts 28 and lower coacting belts 29 mounted upon rolls carried by shafts 30, the lower stretches of the belts 29 passing under guide and tightener rolls or pulleys 31. A drum or roll 32 holds the cooperating stretches of the upper and lower immersion belts close together.

The immersion belts deliver the blanks to a pair of rolls 33 which, in turn, deliver the completed prepared blanks into a pair of receptacles 34 carried by brackets 35 mounted upon a transverse rod 36.

As the drive and gear mechanism of the machine is clearly illustrated, and as it may be otherwise designed and constructed, a detailed description thereof is unnecessary.

A single attendant may, by alternately supplying the two hoppers with the blanks to be fed, and removing the prepared blanks from the receptacles 34, attend to the one machine which is operating on two rows of blanks simultaneously. I preferably construct each receptacle 34 of two members, as indicated by Figure 1, in order to provide a space to facilitate grasping a pile to remove it from said two-part receptacle.

The present invention is particularly adapted for the production of high-glossed blanks with those portions which are to be, later, glue-lapped, in condition to be secured together, without having the external appearance of the boxes marred by lines which are darker or less glossy than the rest of the surfaces of the boxes. And the complete preparation of the blanks is effected without regard to whether a folding machine is at hand and ready to run.

Having now described my invention, I claim:

1. The method of preparing paper blanks for conversion into moisture-proof boxes, consisting in first waxing the blanks, then subjecting those portions of the blanks which are to receive glue to the action of heat, and then chilling the blanks before the heat can affect the opposite surfaces of said portions.

2. The method of preparing waxed paper blanks for conversion into moisture-proof boxes, consisting in subjecting single surfaces of marginal portions of the waxed blanks to the action of heat, and then chilling the blanks before the heat can affect the opposite surfaces of said marginal portions.

3. The method of preparing waxed paper blanks for conversion into moisture-proof boxes, consisting in subjecting single surfaces of marginal portions of the waxed blanks to the action of heat, and then immediately immersing the blanks in cold water.

4. A machine of the character described, comprising means for heating single surfaces of selected areas of waxed paper blanks, and means for subjecting the blanks to the action of a chilling agent.

5. A machine of the character described, comprising means for heating single surfaces of selected areas of waxed paper blanks, a water tank, and means for delivering the blanks quickly into said tank after leaving the said heating means.

6. A machine for preparing waxed paper blanks for conversion into moisture-proof boxes, comprising means for causing the

blanks to travel, means for heating single surfaces of the glue lap portions of the blanks while travelling, and a water bath in position to receive and chill the blanks.

7. A machine for preparing waxed paper blanks for conversion into moisture-proof boxes, comprising means for causing the blanks to travel, elongated heating elements in position to contact with the under surface of one marginal portion and the upper surface of the opposite marginal portion of each passing blank, and a water bath in position to receive and chill the blanks.

8. In a machine of the character described, means for causing waxed blanks to travel side by side, a single heating element in position to simultaneously act on the adjacent marginal portions of two passing blanks, and heating elements in position to act on the other parallel marginal portions of said blanks.

9. In a machine of the character described, carriers for causing waxed blanks to travel side by side, a single heating element in position to simultaneously act on the adjacent marginal portions of said blanks, heating elements in position to act on the other parallel marginal portions of said blanks, and means for laterally adjusting said carriers and heating elements.

10. A machine of the character described, comprising two blank feeders side by side, parallel blank carriers in line with said feeders, a heating element in line with the space between the feeders, two heating elements substantially in line with the outer sides of the feeders, and a water bath in position to receive blanks from said carriers.

In testimony whereof I have affixed my signature.

HAROLD S. LABOMBARDE.