July 15, 1941. M. H. SIDEBOTHAM ET AL 2,249,182

MACHINE FOR WAXING BLANKS

Filed June 4, 1938 3 Sheets-Sheet 1

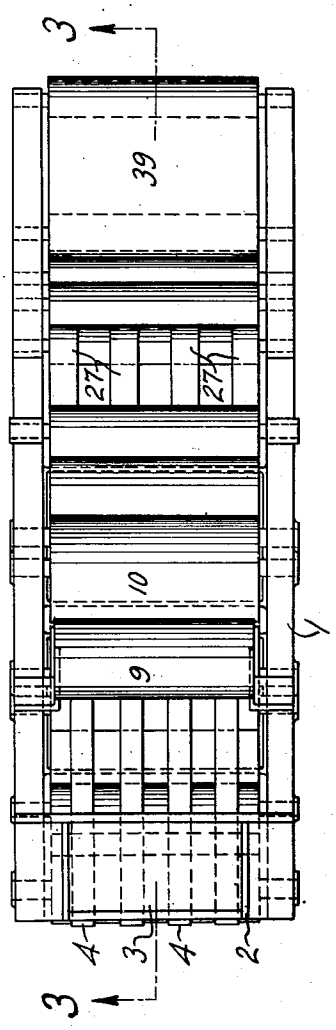


Fig. 1

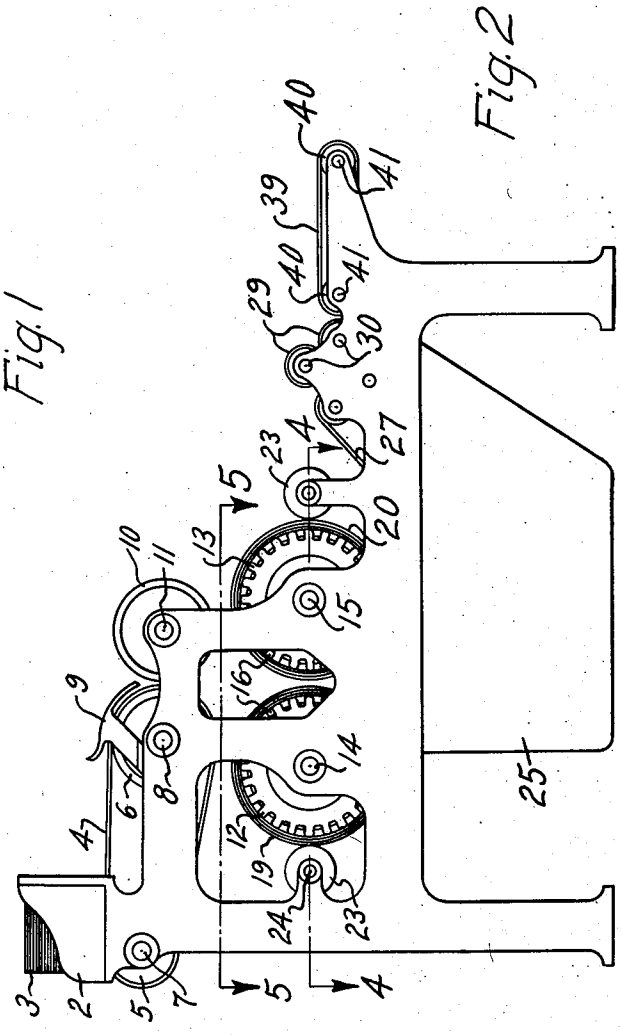


Fig. 2

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MACHINE FOR WAXING BLANKS

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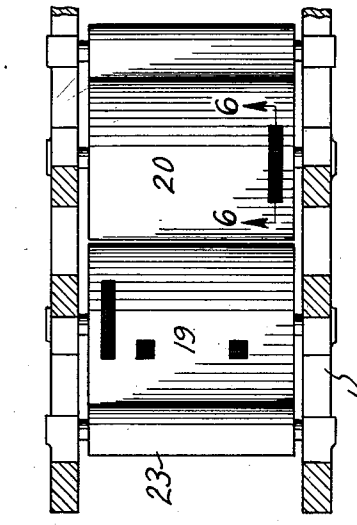


Fig. 5

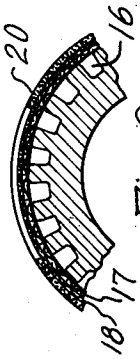


Fig. 6

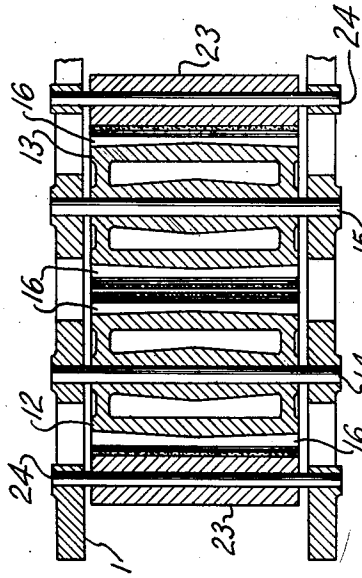


Fig. 4

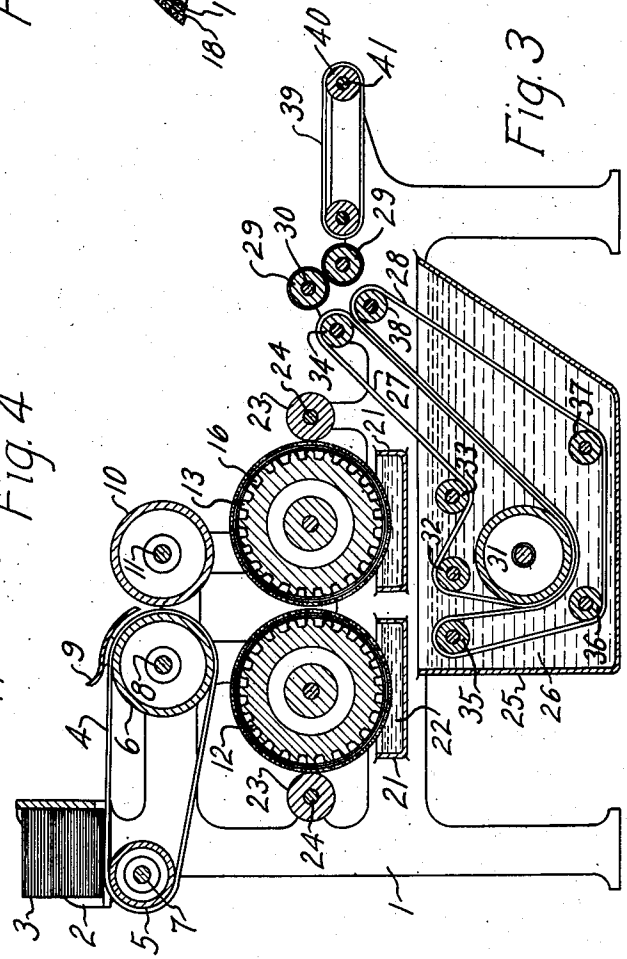


Fig. 3

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MACHINE FOR WAXING BLANKS

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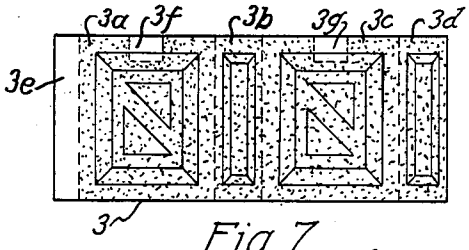


Fig. 7

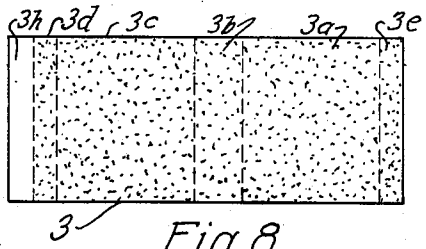


Fig. 8

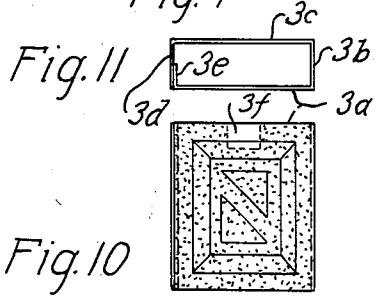


Fig. 11

Fig. 10

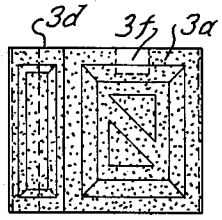


Fig. 9

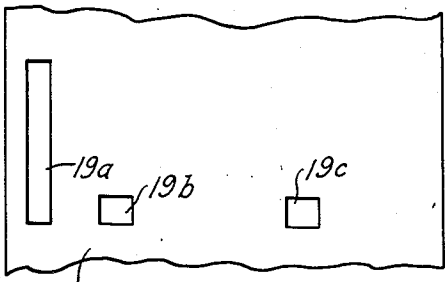


Fig. 12

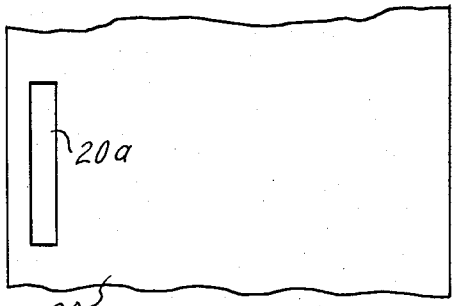


Fig. 13

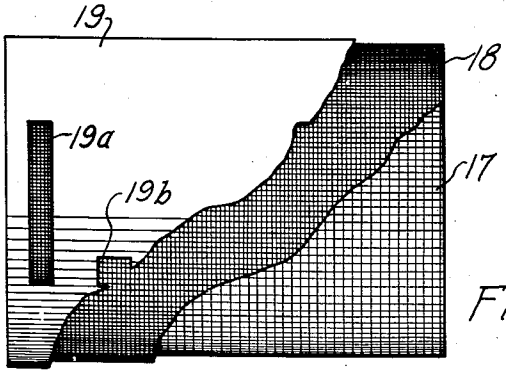


Fig. 14

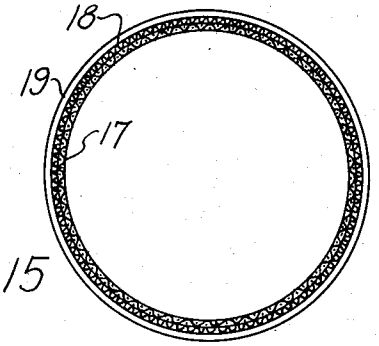


Fig. 15

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Patented July 15, 1941 2,249,182

UNITED STATES PATENT OFFICE

2,249,182

MACHINE FOR WAXING BLANKS

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Application June 4, 1938, Serial No. 211,892

3 Claims. (Cl. 91—51)

This invention relates to the manufacture of moisture-proof paper box blanks, and has particular reference to the manufacture of wax coated blanks having high-glossed surfaces.

Wax coated paper containers having glossy surfaces are very desirable because of their moisture-repelling qualities and improved appearance. To obtain a high-glossed wax finished box blank, the wax must be applied to the blank while the wax is hot and in a liquid condition, and immediately thereafter chilling the waxed blank in cold water, thus solidifying or setting the wax. It is customary to then pass the waxed blank between squeezing rolls to remove the water from the surface of the blank. It is apparent that the squeezing operation could not well be performed after the box has been fabricated, therefore the box must be folded and glued after the waxing, chilling and water freeing operations. In fabricating boxes, from blanks, it is usually necessary to use glue or other adhesive to secure flap sections of the blank. Glue or other adhesive commonly used in making boxes will not penetrate wax, therefore to obtain satisfactory adhesion of the connecting parts of the blank, from which the boxes are made, the coating of wax must either be omitted from the securing sections of the blanks or removed therefrom prior to the fabricating operations.

It has long been a problem to find a machine adapted to high speed production by means of which paper box blanks may be wax coated, chilled and pressed while leaving certain sections of the blank free of wax.

The method disclosed and claimed in United States Patent Number 1,892,083 issued December 27, 1932, to Melvin H. Sidebotham, a co-inventor of the present invention, has proved very successful, but the present invention is much better adapted to large quantity, high speed production.

An object of our present invention is to provide a machine for wax treating paper blanks, while leaving predetermined areas thereof free of wax for adhesive securing purposes.

Other more specific objects and advantages of the invention will be apparent to persons skilled in the art as the same becomes better understood by reference to the following description, taken in connection with the accompanying drawings, in which we have illustrated one practical embodiment of the invention, and wherein:

Figure 1 is a plan view of the machine.

Figure 2 is a side elevation of the machine.

Figure 3 is a section at 3—3 of Figure 1.

Figure 4 is a section at 4—4 of Figure 2.

Figure 5 is a section at 5—5 of Figure 2.

Figure 6 is a partial section at 6—6 of Figure 5, drawn to a larger scale.

Figure 7 is a plan view of the face or outside of one form of blank produced in accordance with our invention.

Figure 8 is a plan view of the inside surface of the blank shown in Figure 7.

Figure 9 is a view of the blank folded to form a container in collapsed condition.

Figure 10 is a front view of the container in set-up condition.

Figure 11 is a top view of the set-up container shown in Figure 10.

Figure 12 is a plan view of a portion of the wax applying pad 19, with cut outs 19*a*, 19*b* and 19*c* provided therein for the purpose of omitting wax from predetermined areas of the blank.

Figure 13 is a plan view of a portion of the wax applying pad 20 with cut out 20*a* provided for the purpose of omitting wax from predetermined areas of the blank.

Figure 14 is a plan view of one of the wax applying rolls showing a portion of the pad 19 and a portion of the outer wire mesh 18 broken away to show the construction of the wax applying rolls.

Figure 15 is an end view of the wax applying roll shown in Figure 14.

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

Referring first to Figures 1 and 2, the different parts or members of the machine are mounted on a base 1 which constitutes the framework of the machine.

The blank supplying unit comprises a hopper 2 in which are stacked the blanks 3 to be wax treated. Blank advancing belts 4 being driven by pulleys 5 and 6 mounted on shafts 7 and 8 journaled in base 1. Guide bar 9 secured to base 1 serves to guide the individual blanks downward as they are advanced singly and successively from the hopper 2 by belts 4. Guide roll 10 mounted on shaft 11 journaled in base 1 co-acts with belts 4 to feed the individual blanks downward.

The wax applying unit comprises a pair of wax applying cylinders 12 and 13 mounted on shafts 14 and 15 journaled in base 1. Cylinders 12 and 13 are provided with a plurality of gutters or grooves 16 (Figures 2 and 4). The outer surfaces of the cylinders being covered with a sheet of coarse meshed wire screen 17 (Figures 6 and 14). A sheet of fine meshed wire 18 is provided on the outer surface of the said coarse meshed wire screen 17. Wax applying pads 19 and 20

(Figures 12 and 13) are secured to the outer surfaces of the fine meshed wire screen 18 of cylinders 12 and 13. The pad 19 of cylinder 12 being cut to the pattern of the outside area of the surface of the blank to be treated with wax. Pad 20 being cut to the pattern of the area of the inside surface of the blank to be treated with wax. In other words, portions of the pads are cut out to correspond with the areas of the surface of the blank which are to be left free of wax. The pad 20 provided on cylinder 13 is different only in pattern from the pad 19 shown on cylinder 12. It is apparent that the cylinder 12 assembly operates to apply wax to areas of one side of the blank while the cylinder 13 assembly operates to apply wax to portions of the opposite surface of the blank. Reservoirs 21 containing hot wax 22 are provided for supplying wax to the pads of each cylinder. Two wax distributing rolls 23 mounted on shafts 24 journaled in base 1 are provided to spread and evenly distribute the hot wax, on pads 19 and 20, and to press out any surplus wax so that the pads will have a uniform amount of wax to transfer to the box blanks.

The next unit comprises the blank chilling device and the delivery mechanism (Figure 3). A tank 25 containing cold water 26 is provided to underlie the wax treating unit. Said tank 25 being supported by the base 1. Conveyor belts 27 and 28 are provided to carry the blanks singly and successively through the cold water bath and pass the blanks to squeezing rolls 29 mounted on shafts 30 journaled in frame 1. Figure 3 illustrates the arrangement of the several rolls which drive and guide the said conveyor belts. Rolls 31, 32, 33 and 34 drive and guide belt 27, and rolls 35, 36, 37, 38 and 31 drive and guide belt 28.

From the squeezing rolls 29 the blanks pass singly and successively to the delivery belt 39 driven and guided by rolls 40 mounted on shafts 41 journaled in base 1.

In the operation of the machine prepared blanks 3 are delivered singly and successively from the hopper 2 to the blank advancing belts 4; thence each blank passes under guide bar 9 and then downward between belts 4 and guide roll 10. Each blank then passes between the wax applying cylinders 12 and 13, the pads 19 and 20 of which are coated with hot wax by causing the said pads to pass through the liquid wax in reservoirs 21. In passing between said wax applying cylinders the pads 19 and 20 apply wax to the corresponding surface of the blank according to the pattern of the pad. Each blank then passes downward into the cold water tank 25. The blanks enter the tank at a point between rolls 32 and 35 and are picked up by belts 27 and 28. Each blank is then carried through the cold water bath between said belts 27 and 28 and thence to squeezing rolls 29 where the water is squeezed from the blanks in passing therebetween. The blanks then pass to the delivery belt 39 to be picked up for use.

The timing of the operation of the machine is such that when the machine is in operation different parts of the machine are operating simultaneously on blanks which pass from one unit to another through the machine.

It will be readily understood, without need of illustration, that any suitable motor may be employed for operating the machine, and that suitable gearing is employed in practice to cause the various rolls and shafts to rotate at uniform peripheral speed to effect travel of the blanks through the machine and to operate the various devices which act on the blanks in the sequence described.

In practice suitable heating devices are provided to maintain the wax in reservoirs 21 in liquid condition. It is sometimes desirable to also provide heating devices on the wax applying cylinders to maintain the wax on the pads in condition for proper application to the box blanks.

While the invention includes the combined instrumentalities above mentioned, we wish it to be understood that we consider the aforesaid machine not only combinatively novel, but insofar as we are aware, certain of the devices going to make up such machine are new in less combinations than the whole and some capable of individual use, as will more clearly appear hereinafter.

Referring to Figures 7 and 8 there is illustrated a box blank, showing its condition after wax has been applied to predetermined areas thereof. Figure 7 shows the printed blank 3 after it has been treated with wax by pad 19 in passing between cylinders 12 and 13. The blank 3 (Figures 7 and 8) is divided by creased lines to form a front panel 3*a*, a back panel 3*c*, end panels 3*b* and 3*d*, and a flap 3*e*. It will be apparent that the areas 3*f*, 3*g* and the surface of the flap 3*e* shown in Figure 7, illustrate the unwaxed surfaces of the outside of the blank. In the application of the wax to the blank by pad 19, the cut out portions 19*b*, 19*c* and 19*a* of the pad 19 will leave free of wax the areas 3*f*, 3*g* and 3*e* of the outside surface of blank 3 shown in Figure 7. Figure 8 illustrates the inside surface of the blank showing area 3*h*, of the end panel 3*d*, free of wax. In the application of the wax to the inside surface of the blank, by the operation of pad 20, the cut-out portion 20*a* (Figure 13) of the said pad 20 will result in leaving the area 3*h* of Figure 8 free of wax.

Figure 9 shows the blank 3 (Figure 8) folded to form a box in collapsed condition, sections 3*a* and flap 3*e* being folded to overly sections 3*c* and 3*b*, and the end panel 3*d* folded to overly back panel 3*c* and flap 3*e*. Thus it will be seen that the unwaxed side of the flap 3*e* and the unwaxed surface 3*h* of the end panel 3*d*, will be in superimposed relation. It is obvious that if an adhesive is applied to area 3*h* or 3*e* before the folding operation, the blank 3 will provide a complete container, which when set up appears as shown in Figures 10 and 11. The areas 3*f* and 3*g* (Figure 7) have been left free of wax so that a stamp or label may be applied to seal the package, of which the blank 3 forms the container.

The container represented by Figures 7 to 11 inclusive, is shown merely for the purpose of illustrating the operation of our improved machine and method of making wax coated box blanks. Our invention is adaptable for producing wax coated blanks of any design wherein predetermined areas are to be left free of wax.

Having now described our invention, what we claim is:

1. In a machine for wax treating box blanks, the combination of a cylinder provided with a plurality of grooves in the outer periphery thereof, the said grooves extending from the ends of the cylinder and lying parallel with the axis thereof, with a frame for rotatably supporting the cylinder, and a wax applying pad mounted on the outer periphery of the cylinder, the said

pad being cut to the pattern of the areas of the blank to be wax treated.

2. In a machine for wax treating box blanks, the combination of a cylinder provided with a plurality of grooves in the outer periphery thereof, the said grooves extending from the ends of the cylinder and lying parallel with the axis of the cylinder; with a sheet member having a plurality of openings therethrough, superposed on the outer periphery of said cylinder; and a wax applying pad mounted on the sheet member, the wax applying pad being cut to the pattern of the areas of the blank to be wax treated; and a frame for rotatably supporting the cylinder.

3. In a machine for wax treating box blanks, the combination of a cylinder provided with a plurality of grooves in the outer periphery thereof, the said grooves extending from the ends of the cylinder and lying parallel with the axis of the cylinder; with a coarse meshed wire screen superposed upon the outer periphery of the cylinder; a fine meshed wire screen superposed upon the coarse meshed wire screen; a wax applying pad, mounted on the fine meshed wire screen, the wax applying pad being cut to the pattern of the areas to be wax treated; and a frame for rotatably supporting the cylinder.

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