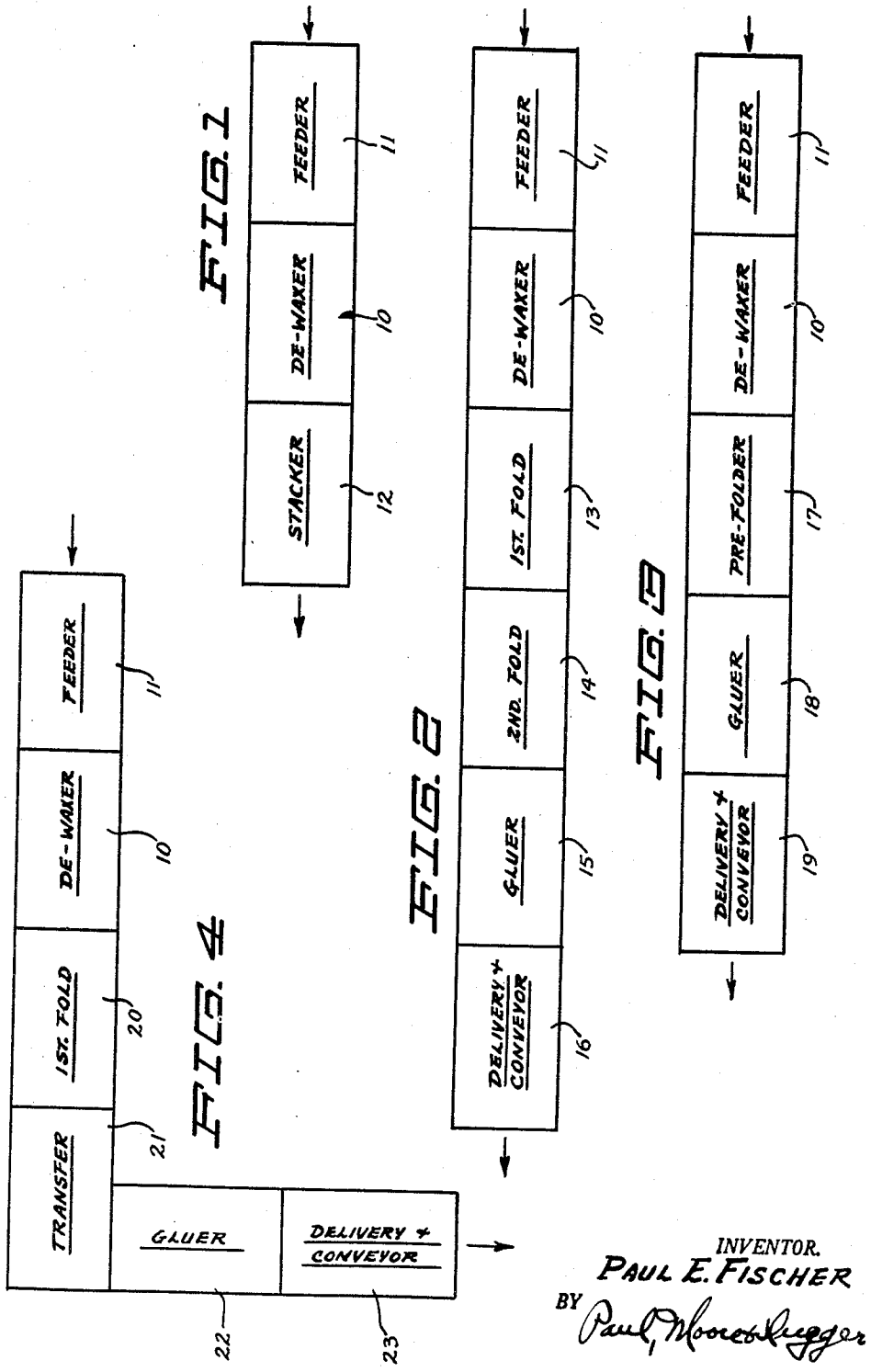
July 1, 1958 P. E. FISCHER 2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Filed March 3, 1955 5 Sheets-Sheet 1



INVENTOR.
PAUL E. FISCHER
BY Paul, Mooney & Fugger
ATTORNEYS

July 1, 1958 P. E. FISCHER 2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Filed March 3, 1955 5 Sheets-Sheet 2

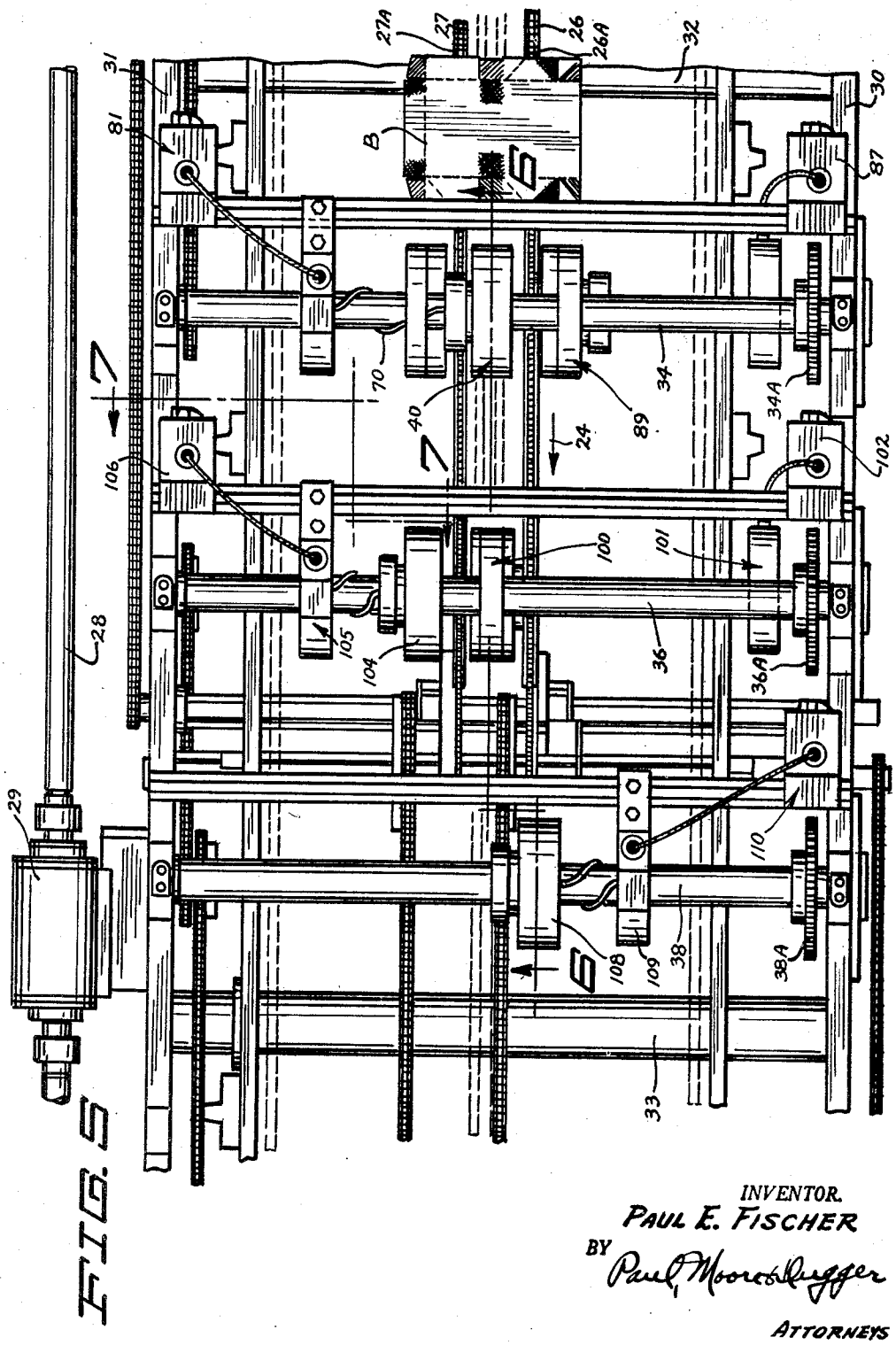


FIG. 5

INVENTOR.
PAUL E. FISCHER
BY Paul O'Moore & Riggs
ATTORNEYS

July 1, 1958 P. E. FISCHER 2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Filed March 3, 1955 5 Sheets-Sheet 3

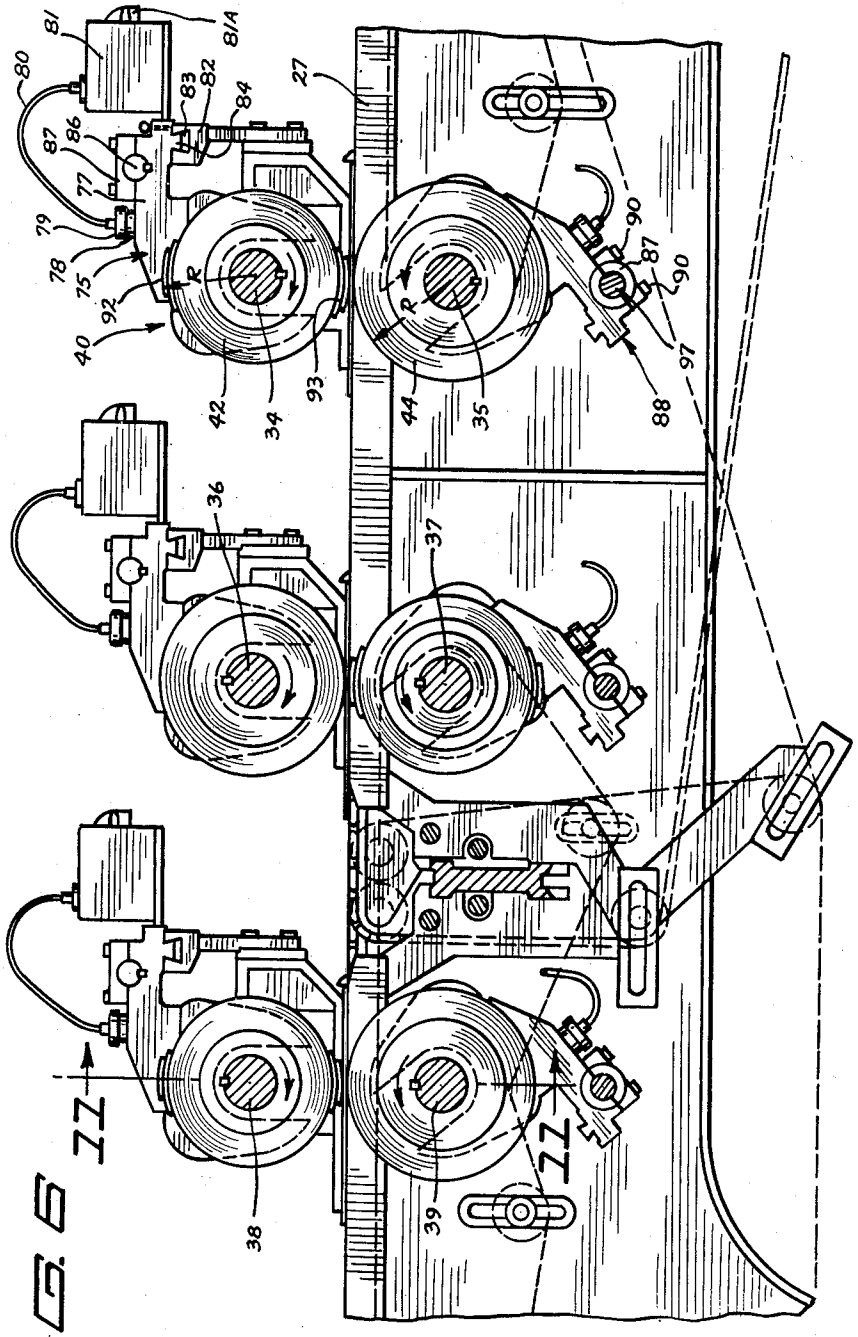


FIG. 6

INVENTOR.
PAUL E. FISCHER
BY Paul, Moore & Rugger
ATTORNEYS

July 1, 1958 P. E. FISCHER 2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Filed March 3, 1955 5 Sheets-Sheet 4

FIG. 7

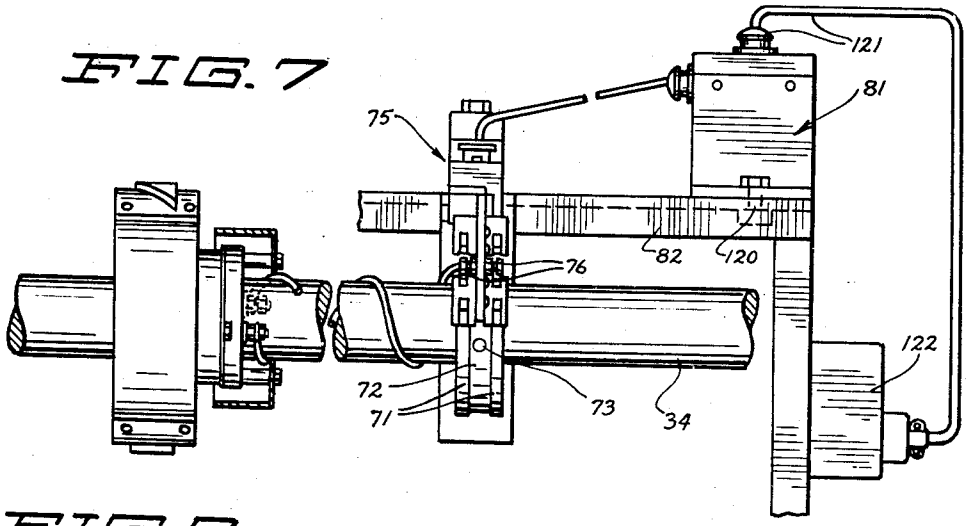


FIG. 8

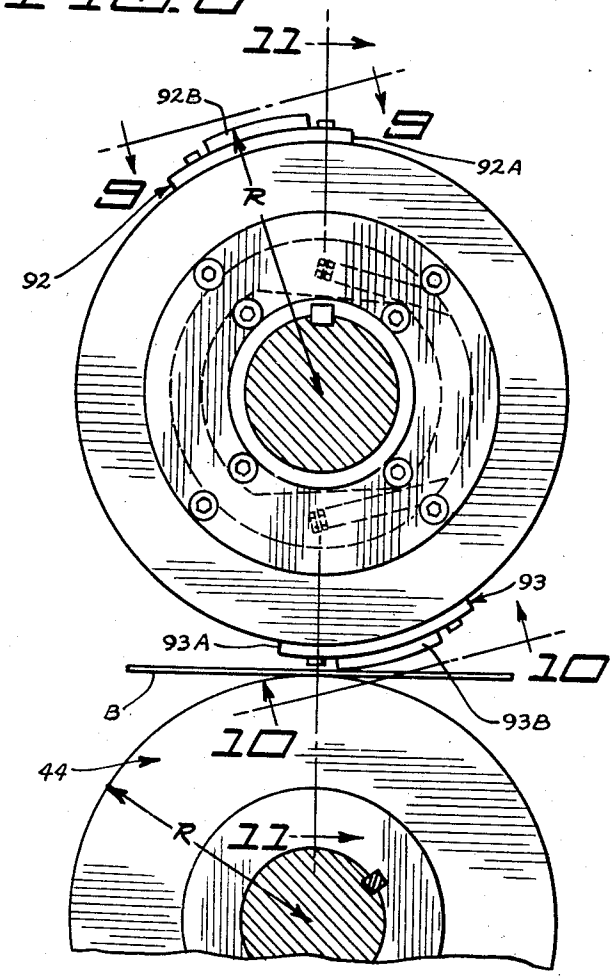


FIG. 9

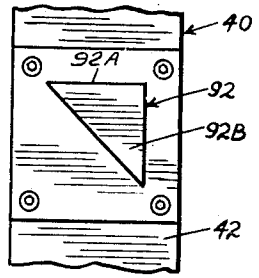
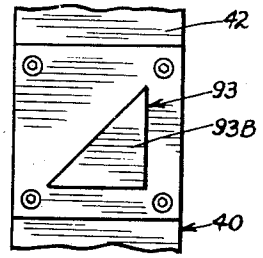


FIG. 10



INVENTOR.
PAUL E. FISCHER
BY Paul, Moore & Hugger
ATTORNEYS

July 1, 1958 P. E. FISCHER 2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Filed March 3, 1955 5 Sheets-Sheet 5

FIG. 11

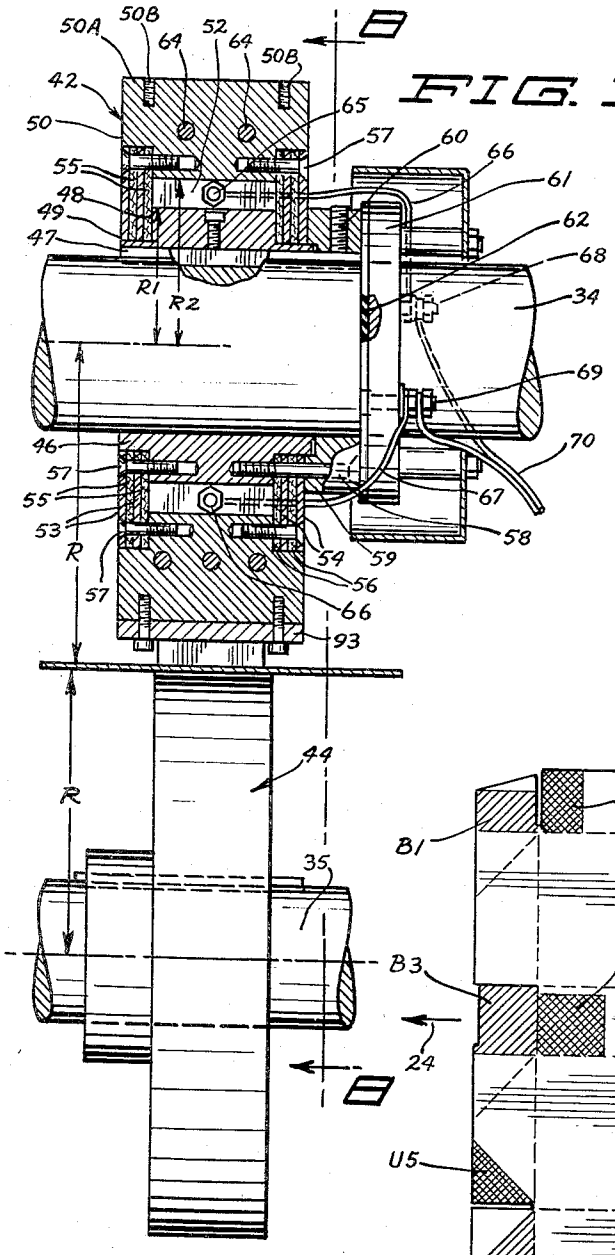


FIG. 12

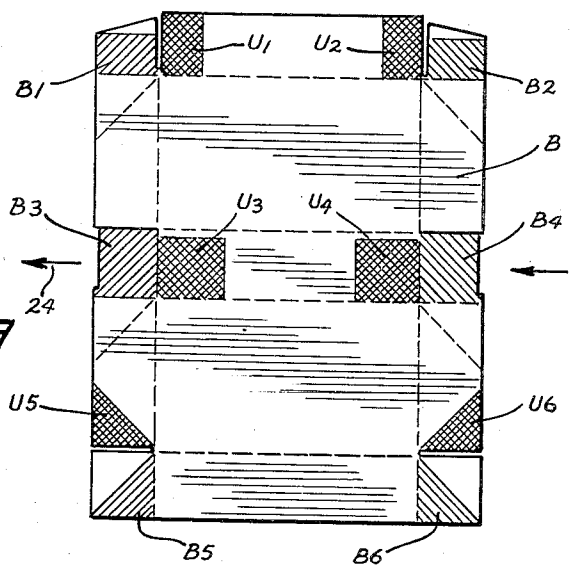
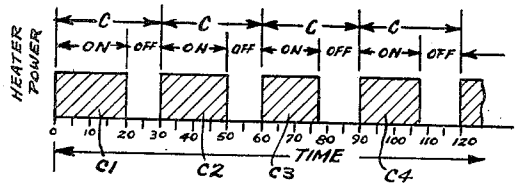


FIG. 13



INVENTOR.
PAUL E. FISCHER
BY Paul A. Moore & Dugger
ATTORNEYS

United States Patent Office

2,841,112

Patented July 1, 1958

2,841,112

ROTARY DEWAXER FOR COATED PAPER OR CARDBOARD BLANKS

Paul E. Fischer, Minneapolis, Minn., assignor to E. G. Staude Manufacturing Company, Inc., St. Paul, Minn., a corporation of New Hampshire

Application March 3, 1955, Serial No. 491,875

5 Claims. (Cl. 118—11)

This invention relates to a machine for the dewaxing of selected areas only of coated paper or cardboard blanks that are used in the making of boxes. In the packaging of modern merchandise, particularly foodstuffs that are sold in a frozen condition, for the preparation of milk cartons and many other types of packages, the package is made of a paper or cardboard material having on one or both surfaces thereof a coating which renders the cardboard impervious or relatively impervious to the passage of liquids or gases through the box. The coating material is frequently paraffin but in many instances with the paraffin there may be mixed other materials which render the coatings less pervious to the passage of moisture and gases therethrough. Such additional materials which may be combined with paraffin, or used independently as a coating material may include such materials as microcrystalline waxes, plastic materials and the like. The coating of wax or composition is applied to the paper or cardboard sheet during the manufacture thereof and for the construction of the box there are then cut from continuous webs of the paper or cardboard, shapes of appropriate dimension and size, which when folded will form the box that is desired. For brevity the paper or cardboard material will hereinafter be referred to as paperboard and the cutout patterns of such material that are used for making the box will be referred to as "box blanks."

In the formation of the box, the box blanks of paperboard are sent through box-forming machines, in which the box blanks are subjected to folding operations and gluing operations for the purpose of making the box shapes. In this operation certain areas and tabs portions of the box blanks are folded into overlying relationship and are cemented to adjacent surfaces so as to form the box blanks. When boxes are made of uncoated material the adhesive that is used for thus cementing portions of the blank together will adhere tightly to the paper board but when wax or other coating materials are applied to the paperboard, the adhesion of the paste, glue or cement, however designated, is so greatly reduced as to preclude proper formation of the box. In order to overcome this difficulty it has heretofore been proposed that the wax or the like impervious coating should be removed from selected areas and various devices have been proposed and built for this purpose. Usually the removal of the wax is sought to be accomplished by applying heat to the surface of the paperboard throughout the area desired to be dewaxed. The apparatus for accomplishing this function, heretofore available has not been entirely satisfactory.

It is an object of the present invention to provide an improved box-making apparatus and more particularly to provide an improved mechanism for removing from the surfaces of coated box blanks, the wax or the like coatings therefrom. It is a further object of the invention to provide a dewaxing machine wherein the wax may be removed with great rapidity and precision from cooperating surfaces of box blanks which it is desired ultimately to bring into juxtaposition for adhesive attachment. It is a further object of the invention to provide a rotary dewaxing machine and to provide a dewaxing machine wherein the temperature of the dewaxing elements may be controlled reliably with great precision without the use of delicate apparatus. It is another object of the invention to provide a dewaxing machine which is adaptable to the dewaxing of selected areas of a wide variety of box blanks and can be modified easily and quickly by the operator of the box-making machine for accomplishing the dewaxing of different shaped blanks and different sizes of box blanks. It is also an object of the invention to provide an improved rotary dewaxing mechanism which can be adapted to existing box-making machines without the addition of undue or cumbersome mechanisms. It is also an object of the invention to provide a rotary dewaxing drum of rugged construction capable of being manufactured at low cost and used without interruption for long periods of service. It is a further object of the invention to provide an automatic and reliable control for the temperature of a dewaxing machine element.

Other and further objects of the invention are those inherent in the apparatus herein illustrated, described and claimed.

The invention is illustrated with reference to the drawings wherein Figures 1, 2, 3 and 4 are diagrammatic schematic plan views of various box-making machine arrangements wherein the apparatus of the present invention may be incorporated;

Figure 5 is a fragmentary plan view, much enlarged, of a representative form of dewaxing apparatus of the present invention illustrating the manner in which the dewaxing elements are positioned for dewaxing portions of a particular representative box blank;

Figure 6 is an enlarged vertical sectional view of the dewaxing apparatus of the present invention, this figure being taken along the line and in the direction of arrows **6—6** of Figure 5;

Figure 7 is a fragmentary vertical transverse view, partly in sections, taken along the line and in the direction of arrows **7—7** of Figure 5;

Figure 8 is an enlarged vertical longitudinal sectional view through the shaft carrying one of the rotary dewaxing elements of the present invention. Figure 8 is taken along the line and in the directions of arrows 8—8 of Figure 11;

Figures 9 and 10 are enlarged fragmentary plan views of dewaxing elements, these figures being taken, respectively, along the line and in the direction of arrows 9—9 and **10—10** of Figure 8;

Figure 11 is an enlarged vertical sectional view of the rotary dewaxing element and backup wheel, this view being taken along the line and in the direction of arrows **11—11** of Figures 6 and 8;

Figure 12 is a plan view of an exemplary form of common box blanks such as may be dewaxed preparatory to box formation by the apparatus of the present invention;

Figure 13 is a graph representing the form of time cycles for operation of the electric heaters of the wax-removing devices used according to the present invention.

Throughout the drawings corresponding numerals refer to the same parts.

The apparatus of the present invention may be used as a separate entity, in which case the already cut box blanks are fed to it and dewaxed by the machine and then stacked. For use in this manner the dewaxer element, shown generally at **10** in Fig. 1, is incorporated in a machine with a feeder **11**, which may be of any construction, known in the art, and with a device known

as a stacker, shown at 12 in Fig. 1, by means of which the box blanks are stacked or otherwise arranged in orderly manner for conveying from the machine. In such an arrangement the feeder 11, dewaxer 10, and stacker 12, constitute the entire device. The present invention is directed to that portion 10, namely the dewaxer, as shown in this figure.

More usually, however, the dewaxer apparatus of the present invention may be utilized as one working stage in a box-forming machine, thus as shown in Figures 2, 3 and 4, there are shown representative types of box-forming machines which are however modified to include the present invention. Thus, in Figure 2 is shown a feeder 11, a de-waxer station 10, and remaining box-forming stations of the machine which include a first folder 13, second folder 14, gluer 15, and a delivery conveyor 16. It is one of the advantages of the present invention that it may thus be incorporated in the usual box-making machine since by so doing the box blanks which have selected areas thereof dewaxed, are carried immediately through the machine and without such dewaxed portions appreciably cooling are immediately carried through the appropriate folding stages and gluer stage, thus completing final box formation. This is a distinct advantage since in the gluer, the adhesive material will more readily stick to and bite into the still hot dewaxed areas than would be the case if the dewaxed box blanks were stacked and permitted to cool. I have observed that this phenomenon is particularly true when the box blanks are coated with those modern coatings which are composed of plastic compositions, alone or plastic in admixture with waxes of various types. It is therefore a feature of the present invention that the dewaxer is incorporated as one stage in a standard box-making machine and that the blanks are fed through the machine with sufficient rapidity that they do not appreciably cool before the glue is applied to the selected dewaxed areas, thereby increasing the adhesive power of the glue for holding the box in its completed form.

In Figure 3 there is illustrated another typical box-making machine to which there is added a dewaxer stage, according to the present invention. Thus, in the Figure 3 machine there is provided a feeder 11, a dewaxer 10, prefolder 17, gluer 18, and delivery conveyor 19. Similarly in Figure 4 there is illustrated a box-making machine wherein the travel of the box blanks is along an L-shape or right angular path. In this machine there is illustrated a feeder 11, a dewaxer 10, a first-fold 20, a transfer table 21, gluer 22, and delivery conveyor 23.

Thus, according to the present invention, the dewaxing mechanism may be incorporated in a complete box-making machine to the end that the box blanks, on which selected portions of the wax coating have been removed, are caused to move with such great rapidity and are glued and folded to complete the final box formation before the surfaces from which the wax has been removed and which are heated during such removal, have appreciably cooled.

In order to accomplish the wax removal with rapidity and precision there is according to the present invention utilized a rotary heated wheel having pads of appropriate shape on the periphery thereof which are run into contact with the blanks, the blank being meanwhile held by a backup wheel. The path and movement of the blank is timed in synchronism with the rotation of the heated wheel carrying the heated pads, and a back-up roller is provided so that the blank is pressed tightly against the heated pad as the roller carrying the pad moves peripherally.

Thus referring to Figures 5–11, at each stage of the machine where a selected portion of the box blank is to be dewaxed, there is provided a heated roller and back-up roller. Referring to Figure 12, there is shown a representative form of common box blanks at B. The box blank is progressed through the machine in the direction

of arrow 24. This blank is of standard form for making a tray-like carton with folded cover, suitable for the packaging of frozen or similar foods. For attaching the various portions of the blank together, adhesive is applied to those upper surfaces denoted U1, U2, U3, U4, U5 and U6. Likewise there are on the bottom surface of the blank B co-operating areas which will be folded against the upper areas U1 through U6. These lower surface areas are shown in the box blank 12 at B1, B2, B3, B4, B5 and B6. The box blank B is shown in Figure 5 as being carried along a path of motion 24 through the machine. The box blank is carried by a pair of roller chains 26—27 having upstanding fingers 26A and 27A thereon which engage the back edge of the blank B and hold it in a certain position with reference to the chains 26—27. The chains 26—27 move through the machine by virtue of gearing and mechanism not illustrated which is driven from, for example, a drive shaft 28, at the side of the machine, through the gear box 29. According to the present invention, the same drive shaft 28 and gear box 29, or other gear boxes and drive shafts which may be provided on the machine and run in synchronism with 28—29, are utilized for synchronously rotating certain rotary cross shafts which extend from one side frame member of the machine to the other. Thus, in Figure 5 there are provided side frames 30 and 31 which are the main side frames of the machine and these are supported in proper relation by transverse members 32, 33 and other members throughout the machine. Suitably journaled in appropriate bearings on the side frame members are the cross shafts 34, 35, 36, 37, 38 and 39, see Figure 6. Three pairs of cross shafts are usually sufficient for dewaxing the areas of any normal box but it will be understood that it is within the scope of the present invention to provide a greater or lesser number of pairs of cross shafts. As shown in Figure 6, the three pairs of cross shafts are arranged as vertically spaced pairs, thus shafts 34 and 35 form a pair, 36 and 37 form a pair, and 38 and 39 form a pair. The rotation of the pairs of shafts is as shown by the arrows thereon and each of the shafts is driven, as by the drive gears 34A, 36A and 38A shown in Figure 5, so that all run at the same speed and in timed relation, in respect to the movement of chains 26—27. The rate of rotation of the shafts is such that a back-up roller and heated pad, of a given equal radius, will have a peripheral speed equal to the linear speed of the chains 26 and 27. For convenience all of the rotary back-up rollers that are utilized are the same diameter and the heated pads are segments of a circular rim which has a radius from its mounting shaft precisely equalling that of the back-up roller. By this means it is therefore feasible to interchange the rotary pads on their rotary hubs, and to interchange the back-up rollers as desired. The rotary pads and back-up rollers are arranged in pairs and, as all are identical, only one pair need be described in detail.

Thus referring to Figures 7 through 11 particularly, there is illustrated one rotary dewaxing wheel and pad, where the wheel is above the rotary back-up roller. This may be assumed to be the mechanism shown at position 40 of Figures 5 and 6. At this position the upper shaft 34 is provided with a heated roller generally designated 42, and co-operating lower shaft 35 is provided with a back-up roller generally designated 44. Each of the shafts is keyed so that the heated roller 42 and back-up roller 44 rotate with the shaft, without turning. These rollers may be shifted along the shaft for adjustment transversely of the machine. The radius of the heated roller 42 as measured to the outer surface of the heated pad 93 thereon is precisely equal to the radius R of the back-up roller 44.

The heated roller 42 consists of a hub 46 which is keyed at 47 to the shaft 34. The hub is provided with a shoulder portion 48, forming a surface at 49. Around the hub there is positioned a tire 50 having a bore of radius R2, which is considerably larger than the radius

R1 of the hub. There accordingly is provided a space at 52. In order to support the tire 50 concentrically with the hub there are provided at each side of the assembly a plurality of metallic and insulating rings. Thus there may be provided metallic rings at 53 on the left side of the hub as shown in Figure 11 and metallic rings at 54 at the right side. Interleaved between the metallic rings are rings of insulating material such as asbestos. The insulating rings are shown at 55 to the left in Figure 11 and at 56 to the right in Figure 11. In order to hold the metallic and insulating rings in place, there are provided a plurality of screws at 57—57 at the left and at 58 on the right. These screws hold the inner and outer edges of the rings to the hub and tire respectively. The inner set of screws at the right side shown in Figure 11, are extended outwardly as at 58 and serve to secure in place an outer collar 59 which is provided with a set screw at 60 by means of which the key 47 may be secured, and the entire assembly 42 kept from shifting axially on the shaft 34. The collar 59 also serves as a mounting place for a terminal collar 61 which is insulated by an insulating ring 62.

The tire 50 is a casting and in it is cast an armored electrical heater element 64 which extends around the periphery of the tire through two or more turns, or as many turns as needed for distributing the heat of the element to the tire. The electrical heating element has interned terminals at 65 and 66, the terminals being in the space 52. From the terminals extend connecting wires 66 and 67 which pass out through apertures through the set of rings, 54 and 56 and extend to and are mounted on terminal studs 68 and 69 on the insulating terminal collar 61. From the studs 68 and 69, which are therefore electrical connections, there extends a flexible cord 70 which wraps around the shaft 34 in one or more turns and terminates at slip rings 71, see Figure 7. The slip rings 71 are of standard construction, two in number, and are mounted upon an insulating collar 72 which is arranged with a set screw at 73 so that it likewise may be mounted to turn upon the shaft 34, or shifted along the shaft for adjustment purposes. Cooperating with the slip rings is a brush holder bracket assembly generally designated 75, see Figures 6 and 7. For each assembly composed of a heated wheel 42, slip rings 71 there is also provided a brush holder of the type shown at 75. The brush holder is of standard construction (save for mounting) and has a pair of brushes at 76, see Figure 7, and these are mounted in insulated relationship on a metallic bracket 77, which is provided with a terminal at 78 into which an electrical connection plug 79 may be attached. The plug 79 is connected through a cord 80 to a control box 81, the function of which will be described.

For each of the pairs of shafts 34—35, there are provided supports for the brush holder assemblies for both the upper shaft position 34 and the lower shaft position 35. Thus allowing shifting of the brush holder to serve the heated roller whether the latter be mounted on upper shaft 34 or lower shaft 35. The upper support consists of a member 82 having a V-way channel 83 extending thereacross into which the dovetail 84 of the brush holder frame 77 is adapted to be attached. The brush holder may be provided at 84 with a locking nut to hold the brush holder against transverse displacement once it is adjusted to the proper position in way 83. The way 83 extends entirely across the width of the box-making machine and the brush holder may therefore be adjusted to any position. The reason for this is that the rotary dewaxer may be desired to be displaced axially in respect to the shaft 34 to any position across the width of the machine and the brush holder is correspondingly displaced along with the slip ring. It will be noted that the brush holder is also provided with an aperture at 86 and a clamping block 87 held in place by cap screws. This form of mounting is utilized when the brush holder is placed in a position such as to serve slip rings located on

the shaft 35. This position is shown generally at 88, adjacent to shaft 35. It will be noted that at location 89, see Figure 5, there is a back-up roller on the upper shaft 34 and below it is a heated dewaxing roller. Such dewaxing roller is served by the brush at position 88. The brush holder at position 88 is mounted upon a transverse rod 97 extending from one side frame member to another. The brush holder is held in any adjusted position by tightening down the clamping block 87 by means of the screws 90—90.

Referring again to Figure 11, the tire 50, is thus heated by the cast in heating element 64 and the outer surface 50A of the tire accordingly becomes very hot. This outer surface is provided with spaced sets of drilled and tapped holes 50B at 20° intervals around the circumference of the roller. To these tapped holes there are attached pads which do the actual dewaxing operation. These pads are best illustrated in Figures 8 through 11. Thus referring to Figure 8 there are provided two oppositely disposed pads generally designated 92 and 93. These pads are of identical pattern and have an inner concentric flange portion 92A and a central land 92B, for the pad 92 and a flange 93A and land 93B for the pad 93. The lands 92B and 93B are cut so as, when rotated into contact with the blank, they will print (or cover) the space on which it is desired to place glue, for example, pattern as shown in Figures 9 and 10. These are representative of customary areas, such as the areas U5 and U6 of Figure 12, or B5 and B6 of Figure 12, which may be desired to be dewaxed. The lands are shaped appropriately in dimension and contour and since they are mounted upon the tires 50 of the wheels 42, and the entire assembly 42 of the dewaxer rotates in harmony and synchronism with the movement of the blank B, adjustment may be made so that selected areas, accurately located dimensionally in respect to the blank B, may be dewaxed. For accomplishing such an adjustment, the lands must be placed at appropriate intervals around the periphery of the tire 50, and the wheel 42 must be adjusted transversely of the machine, on shaft 34, so as to bring the land against the precise portion of the blank B which it is desired to dewax, as the blank passes between the land and the back-up roller 44, as shown in Figure 8. In some instances, as where exceedingly large boxes are being made, only one such pad 92 or 93 can be mounted upon the roller 42 but in the usual small box, several lands can be mounted, positioned and adjusted so as to dewax a pair of cooperating areas for each rotation of the wheel 42.

To sum up therefore, at each of the dewaxing stations, represented by the station 40 in Figure 5, or the station 89, or for any of the stations that may be desired to be provided on shafts 34 to 39, there is a pair of cooperating rollers; one a heated roller as at 42 and the other a back-up roller as at 44 and such heated roller is provided with electrical power supply through a slip ring and brush assembly as shown in Figure 7 from a control box generally designated 81.

Referring to Figure 5 there is shown at location 100 a lower dewaxing roller and cooperating upper back-up roller. The lower dewaxing roller is served by the brush holder and slip ring assembly 101 from an electrical control box 102 which is identical with the control box 81 serving position 40. Similarly at location 104 in Figure 5, there is a pair of composed of an upper dewaxing roller and a lower back-up roller served by a brush holder and slip ring assembly 105 from the control box 106. Similarly at location 108 on shaft 38 there is a heated dewaxing roller on the upper shaft and a cooperating back-up roller on the lower shaft, which is shaft 39, the heated roller being served to the slip ring and brush assembly 109 from the electrical control box 110. Accordingly, as many rollers may be used as desired and these may be adjusted in position along the length of any of their respective shafts 34 through 39. The heated

rollers are provided with pads of appropriate shape, dimension and position, and they are adjusted to take off the wax of selected areas of any box blank within the capacity of the machine.

For controlling the degree of heat of the dewaxing rollers there is, according to the present invention, used the following system: Each of the identical control boxes 81, 87, 102, 106 and 110 (or as many as there are used), individually serves a certain heated dewaxing roller of the type at 42 in Figure 11, as described. The heat input to the dewaxing roller must be varied according to the ambient temperature, the amount of wax which is removed, the rate at which blanks are fed through the machine, and the heat of vaporization of the wax itself. These many variables require a relatively wide range of heat input to the rollers, and provision must therefore be made for varying the heat input, to the end that the temperature of the heated pads 92 and 93, on each of the rollers 42, may be maintained sufficiently hot so as adequately to vaporize the wax coating, but without getting so hot as to burn or scorch the paperboard. To accomplish this function according to the present invention, there is provided an electrical timer switch mechanism in the box 81 and a similar timer mechanism in all of the other identical controls 87, 102, 106 and 110 enumerated. This timer mechanism is, per se, of standard form and operates on a continuous cycle of relatively short duration, such as a 30-second cycle. The particular cycle duration which is chosen is not of extreme importance, the only requirement being that it be repeated with reasonable frequency, preferably at less than 1-minute intervals. The timer mechanism, such as 81, which in itself forms no part of the present invention except as it is a component in the organization, is of a type such that a circuit is closed at the beginning of the cycle and maintained closed for a certain portion of the cycle which may be varied from 0% of the cycle up to 100% of the cycle. Thus referring to Figure 13, there is illustrated the operation of the timing mechanism. It may be assumed that the time cycle has a time duration of 30 units, as for example 30 second, denoted by the dimension C on the time scale. The total length of the time cycle may be from a fraction of a second up to several minutes. Thus, where a machine may process several hundreds of box blanks per minute, the timer may have a total cycle length as short or even shorter than the time for processing one blank up to and even longer than the time for processing several hundred blanks. At the beginning of each cycle, as at time 0 seconds, 30 seconds, 60 seconds and 90 seconds, the circuit is closed by the timing mechanism and the circuit remains closed during the "on" period. The circuit is then opened for the balance of the cycle, as shown by the dimension "off." For the first two cycle positions as shown at C1 and C2, the circuit is adjusted to remain closed; for example, 20 seconds out of 30 seconds, the balance, or 10 seconds, being "off." The machine may run continuously for long periods with such a division of the "on" and "off" portions of the cycle. The heat capacity of the tire 50 and the pads 92 and 93 thereon serves to average out the temperature, which accordingly will vary relatively slowly as adjustments of the timers 81 etc. are made from time to time, and as the heat consuming conditions vary. If the box blanks become overheated (and this condition is readily indicated by a slight darkening of the dewaxed surface), the temperature may be reduced by the operator for any of the dewaxing stations, by merely changing the adjustment of the timer by means of dial 81A. A corresponding timer adjustment of any of the other units so as to decrease the "on" and increase the "off" portion of the cycle may be made. Such an adjustment is indicated as at C3 and C4 in Figure 13, where the timer for the "on" portion has been decreased to approximately 18 seconds and the "off" portion of the cycle increased correspondingly to approximately 12 seconds. Accordingly, by turning the heating element 42 "on" and "off" repeatedly, once for each cycle, and by using cycles of short duration, one is able accurately to adjust the temperature of the dewaxing wheel 42. The operator may individually control the temperatures of each of the rotary dewaxing stations, since the heat loads on all may not be equal. Since the timers 81 are of standard construction, easily manufactured and low in cost, and yet of rugged and reliable operating characteristics, they may be used for long periods without difficulty.

Each of the timers at 81, 87, 102, 106, and 110 is mounted on the cross rails 32 at the appropriate stations, by means of a clamping bolt at 120 and each timer is served by a power input lead 121 from supply boxes 122 on the sides of the machine frame.

Many variations may be made in the details of the present invention without departing from the spirit and scope thereof and the specific devices herein shown and described must therefore be considered only as illustrative of the invention and not as limitations thereon.

What I claim is:

1. A machine for dewaxing selected portions of the surface of wax-coated box blanks comprising a frame, a power drive on the frame, box blank carrier means connected to said power drive and mounted on the frame for carrying said blanks along a straight plane of movement at a predetermined speed and in succession, at least one pair of cross shafts extending across the machine at equal distances above and below the plane of movement of said box blanks, said shafts being connected to the power drive so as to be driven thereby in synchronism with said box blank carrier means, heated roller means mounted on one of said shafts, said roller means having a pad on the periphery thereof forming a circumferential surface thereof, said pad being shaped to correspond to the area of the box blank which it is desired to dewax, and support roller means on the other shafts having a diameter such that it will hold the box blank against said pad as the blank is moved therebetween.

2. In a rotary dewaxer for dewaxing selected areas of box blanks, a pair of wheels for rolling engagement of the outer peripheries thereof, said pair being composed of a back-up roller having a continuous outer periphery and an impression wheel comprising a hub and a tire attached to said hub and thermally insulated therefrom, said impression wheel having the outer periphery of its tire interrupted to provide at least one raised portion with a selected area of engagement against said back-up roller, said impression wheel tire having substantial heat capacity and said raised portion having relatively small heat capacity compared thereto, said impression wheel being provided with an electric heater for the tire thereof for heating said raised portion, an electric circuit including a slip-ring and brush assembly for energizing the electric heater as the impression wheel rotates, means for moving box blanks in synchronism with and in adjusted position between the wheels as they rotate for engagement of the impression wheel raised portion with the corresponding selected area of each box blank, and means for controlling the amount of electrical energy supplied to said heater, whereby said thermally insulated impression wheel tire of comparatively large heat capacity tends to stabilize the temperature of said impression wheel raised portion and prevent rapid temperature changes thereof.

3. A dewaxing assembly for dewaxing selected areas of box blanks comprising a back-up roller having an outer periphery of uniform width and an impression roller having a tire thermally insulated from the hub thereof, said impression roller tire being provided with at least one detachable pad extending radially outwardly therefrom and forming a peripheral surface for rolling contact with the outer periphery of said back-up roller, said pad being in thermal contact with said tire, said tire having a substantially greater heat capacity than the heat

capacity of said pad, a pair of shafts for mounting said rollers in a position such that the periphery of the back-up roller and the peripheral surface of the pad portion on said tire will roll in contact with opposite sides of a box blank which is moved edgewise between them, an electric heater mounted on the tire of said impression roller, and an electric circuit including slip rings and cooperating brushes for communicating electric power to the electric heater, whereby said thermally insulated impression roller tire of comparatively large heat capacity tends to stabilize the temperature of said pad and prevent rapid temperature changes thereof.

4. A dewaxer wheel assembly in a box blank dewaxing machine comprising a shaft rotatably mounted in said machine, a hub fixed to said shaft for rotation therewith, a tire of larger internal diameter than the outer diameter of said hub mounted on said hub by a rigid thermally insulated connection extending outwardly from said hub, a dewaxer pad detachably mounted on the outer surface of said tire in intimate thermal contact therewith, said pad being shaped to correspond to the area of the box blank which it is desired to dewax, said tire extending continuously around said hub and having substantially greater heat capacity than said pad, said tire being provided with an electric heater, and electrical connections including a slip-ring and brush assembly connecting said heater with a source of electrical energy for heating said tire, whereby when said heater is supplied with electrical energy said tire of substantially greater heat capacity will heat said dewaxer pad and minimize temperature fluctuations therein without conducting any substantial amount of heat to said hub, shaft, and machine.

5. A dewaxer wheel assembly in a box making machine comprising a hub having means thereon for detachably securing it at varying places along a shaft for rotation with said shaft, a heavy tire of larger internal diameter than said shaft, a heat insulating connection between the tire and hub for mounting the tire in spaced relation concentrically with the hub, said tire being provided with an electrical heater, a terminal block mounted on said shaft, and electrical connections between the heater and said terminal block, said heat insulating connection comprising thin rings of metal and rings of heat insulation therebetween, said rings being secured respectively to said hub and tire.

References Cited in the file of this patent

UNITED STATES PATENTS

1,505,227	Staude	Aug. 19, 1924
1,541,600	Steenstrup	June 9, 1925
2,115,283	Potdevin	Apr. 26, 1938
2,194,587	Brown et al.	Mar. 26, 1940
2,357,845	Nordquist	Sept. 12, 1944
2,602,416	Perilli	July 8, 1952