Dec. 1, 1931. A. WINKLER ET AL 1,834,567

METHOD OF AND APPARATUS FOR DRYING THE CLOSURE FLAP GUMMING OF ENVELOPES AND THE LIKE

Filed Jan. 22, 1931 2 Sheets-Sheet 1

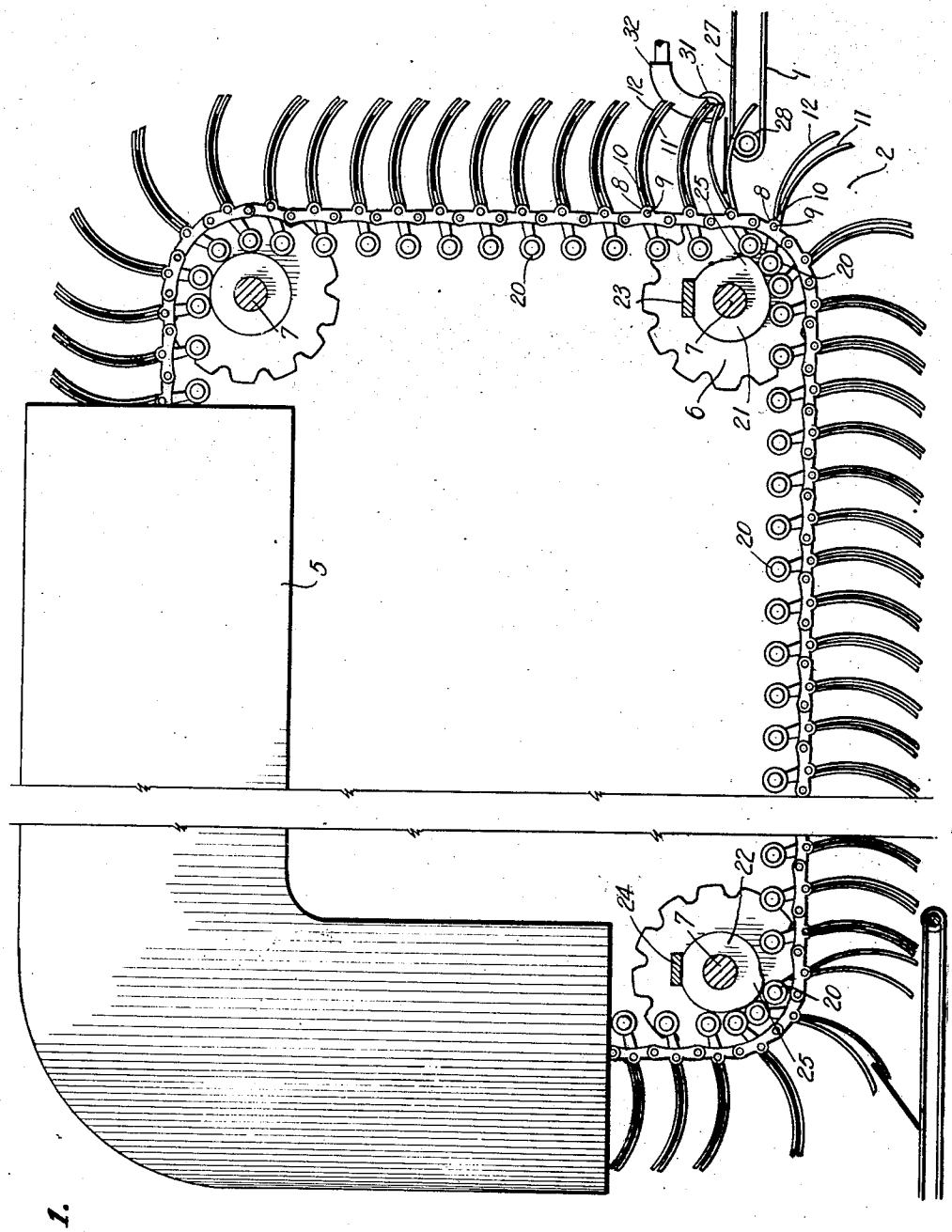


Fig. 1.

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Fig. 2.

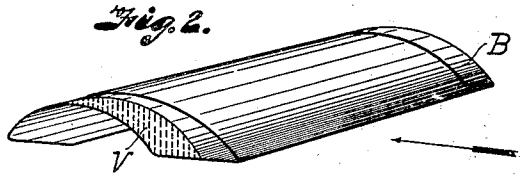


Fig. 3.

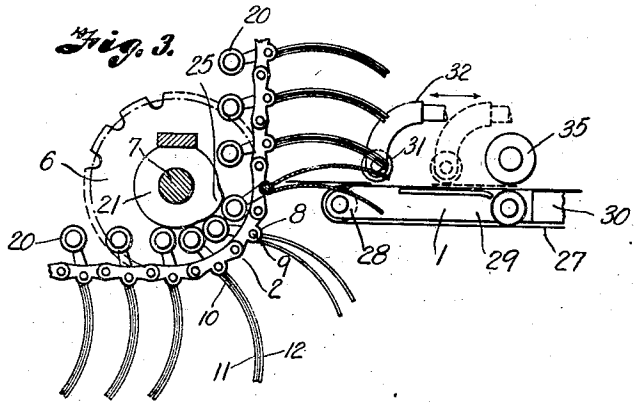
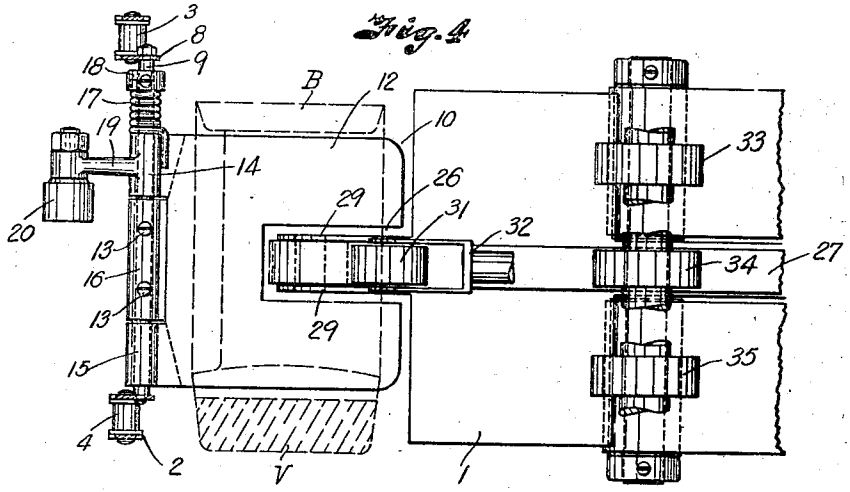


Fig. 4



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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR DRYING THE CLOSURE FLAP GUMMING OF ENVELOPES AND THE LIKE

Application filed January 22, 1931, Serial No. 510,460, and in Germany April 9, 1929.

This invention relates to a method of and apparatus for drying the gummed closure flaps of bags, envelopes and the like.

In machines commonly employed in the manufacture of flat bags, envelopes and the like, and particularly those having high capacity, it is difficult to dry adhesive on the flaps in the allotted time and space without curling of the closure flaps. For example, if the drying time is shortened by employing high temperatures, the quick drying of the adhesive will cause curling of the closure flaps and when the flaps are dried at low temperatures the great length of time required for drying them limits output of the machine.

It is therefore an object of the present invention to provide a method of and an apparatus for drying the closure flaps at high temperatures rapidly but without curling of the flaps.

It is also an object of the invention to insure the positive contact of the glued side and bottom flaps with the bodies of the envelopes during the drying operation.

In accomplishing these and other objects of the invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a drying mechanism embodying our invention.

Fig. 2 is a perspective view showing the curvature of an envelope during the drying operation.

Fig. 3 is a side elevation of the receiving portion of the drying track particularly illustrating its relation with the delivery conveyor of an envelope making machine.

Fig. 4 is a horizontal section through the drying track and a plan view of the discharge end of the delivery conveyor for bringing the envelopes to the drier mechanism from the envelope machine.

Referring more in detail to the drawings: 1 designates the delivery end of a conveyor for conducting envelopes from a forming machine (not shown) to drying apparatus generally designated 2, including a housing 5, and conveying apparatus preferably including an endless belt preferably formed of a pair of roller chains 3 and 4 spaced apart a distance substantially equal to the width of the conveyor and adapted for travel through the housing, the housing being of sufficient length to permit the envelopes to dry during their travel therethrough. The chains 3 and 4 operate over guiding sprockets 6 rotatably mounted on shafts 7, selected links on the chains being provided with outwardly projecting ears 8, and corresponding links on the paired chains being connected by rods 9. Mounted on each of the rods 9 is an envelope carrier generally designated 10, preferably consisting of a pair of complementary curved plates 11 and 12, one of which, here shown as the plate 11, is fixed to its rod 9 by screws or other fastening devices 13 extending through a nave 16 on the plate to engagement with the rod so that the plate extends at substantially a right angle to the belt. The complementary plate 12 has naves 14 and 15 pivotally mounted on the rod at the ends of the nave 16 of the fixed plate, and coiled about each rod is a spring 17 connected at one end with a collar 18 fixed on the rod with its opposite end in engagement with the pivoted plate 12 to retain the latter in clamping relation with its complementary fixed plate.

The nave 14 of each plate 12 is provided with an arm 19 having a roller 20 adapted to engage a cam 21 on the shaft 7 adjacent the delivery end of the conveyor, and a complementary cam 22 on the shaft adjacent the discharge end of the dryer housing so that the carriers may be opened thereby to receive an envelope in the first instance and to discharge an envelope in the second instance.

The cams are retained in fixed position by brackets 23 and 24 respectively, so that high

lobes 25 thereon, engage the rollers to rock the arms in effecting opening of the carriers as hereinafter described. The forward edges of the plates are provided with slots 26 through which a conveying belt 27 on the conveyor 1 projects, so that as the envelopes are successively moved from the end of the belt 27, they are positioned between the plates which have been opened to receive them.

The conveyor belt 27 is guided in the path of the carrier members by a roller 28 carried by arms 29 projecting from the conveyor frame 30. Supported above the belt and movable backward and forward in the directions indicated by the arrows is a roller 31 supported by a yoke-shaped arm 32 and cooperating therewith are aligning rollers 33, 34 and 35 for advancing the envelopes into the carriers.

The conveyor chains are preferably moved intermittently by any type of intermittent transmission mechanism, not shown, so that the carriers are stopped momentarily as they are opened to receive the envelopes from the conveyor 1, the opening being accomplished by the rollers 20 riding over the high lobes of the cam 21.

As the rollers move off the high points of the cam 21, the pivoted plates close on the envelopes received therein under influence of their springs, and curve the bodies of the envelopes and their extended closure flaps on a line of curvature corresponding to the curvature of the plates.

In operating a machine constructed and assembled as described, the envelopes with their end flaps B closed and their gummed closure flaps V open are delivered from the forming mechanism into the dryer with the closure flaps edgewise, i. e., with the closure flaps extending laterally relative to the direction of travel, to be received in the carriers of the conveyor mechanism. As each carrier reaches a position in front of the delivery mechanism the rocker arm of the pivoted plate member of the carrier engages the adjacent cam to open the carrier against the tension of its spring so that an envelope may be deposited in the carrier. Further movement of the conveyor conducts the rocker arm out of contact with the cam, thereby effecting release of the pivoted plate so that the latter closes against its complementary fixed plate, clamping the envelope and bending the envelope and closure flap to concavo-convex contour.

The paired plates, constituting the respective carriers, are so arranged on the belt with relation to delivery of the envelopes from the forming mechanism that the gummed strips on the flaps will be on the convex side thereof in order that the tendency of the gum to draw the material upon drying of the gum will effect a straightening of the flap as distinguished from curvature of the flap which would occur if the gum were dried on a flat surface. Travel of the conveyor from the receiving station through the housing 5 is at a speed to insure drying of the gum within the housing, and as the envelopes emerge from the housing the rocker arms of the pivoted plates move into engagement with another cam arranged to open the carrier and permit the envelopes to discharge at a receiving station.

It is thus apparent that by our method and with the apparatus described we not only take advantage of the drying operation to insure properly formed closure flaps, but further insure effective sealing of the closed flaps to the body of the envelope by compression of the envelopes between the carrier plates.

What we claim and desire to secure by Letters Patent is:

1. The method of drying the gummed closure flaps of envelopes comprising rearwardly curving the envelopes transversely to the line of gumming of the flaps and passing the envelopes through a heat zone while bent as described.

2. An envelope or like drying conveyor including spaced chains, sprockets for the chains, pairs of curved plates on the chains, means for separating the plates to receive the envelopes, means for closing the plates to curve the envelopes and their flaps rearwardly and transversely to the line of gumming of said flaps while they are being carried thereby, and means for opening the plates to allow discharge of the envelopes.

3. The method of drying the gummed flaps of envelopes including bending the flaps to concavo-convex formation with the gummed surfaces at the convex sides of the flaps, conducting the envelopes through a drying zone, and retaining the flaps bent as described during travel of the envelopes through said zone.

4. The method of drying the gummed flaps of envelopes including delivering the envelopes to a drying zone with their gummed flaps open and extended laterally of the line of travel, bending the flaps on axes parallel with the longitudinal axes of the envelopes and the extended flaps, and retaining the flaps bent as described during their travel through said zone.

5. In apparatus of the character described, a conveyor including grippers formed to receive envelopes having open, freshly gummed flaps rearwardly and to bend the flaps transversely of their lines of gumming, and means for closing and opening the grippers to grasp and release the envelopes.

6. In apparatus of the character described, a conveyor including pairs of curved jaws shaped to rearwardly curve envelopes delivered thereto, means for delivering envelopes to the paired jaws with gummed closure flaps of the envelopes extended laterally of the jaws, means for closing and opening

the jaws at spaced stations, and a dryer housing enclosing the conveyor between the stations.

7. In apparatus of the character described, a conveyor including a pair of curved jaws shaped to rearwardly curve envelopes delivered thereto, one movable toward and from the other, means for actuating the movable jaw at spaced stations to grip and release envelopes delivered between the jaws, and a dryer housing enclosing the conveyor between the stations.

8. Apparatus of the character described including a conveyor belt, curved jaws fixed to the belt at spaced intervals, movable jaws complementary to the fixed jaws, means for rocking the movable jaws to receive and discharge envelopes at spaced stations, said jaws being shaped to rearwardly curve envelopes delivered thereto, and a dryer housing enclosing the conveyor between the stations.

9. In apparatus of the character described, a conveyor including a belt, paired plates on the belt, one movable relative to the other and having a rocker arm, said paired plates being shaped to rearwardly curve envelopes delivered thereto, means for yieldingly urging the movable plate toward closed relation with the fixed plate, and cam mechanism engageable by the arm to shift the movable plate to open position relative to the fixed plate.

10. In apparatus of the character described, a conveyor including a belt, curved plates fixed to the belt and extending outwardly therefrom, plates complementary to the fixed plates pivotally mounted on the belt, said jaws being shaped to rearwardly curve envelopes delivered thereto, and means for opening and closing the movable plates relative to their complementary members.

11. In apparatus of the character described, a conveyor including paired belts, rods extending between the belts, curved plates fixed on the rods, complementary curved plates pivotally mounted on the rods and provided with rocker arms, said plates being shaped to rearwardly curve envelopes delivered thereto, yielding means urging the pivotally mounted plates toward their complementary members, and cam mechanism engageable by the rocker arms to shift the pivotally mounted plates against the tension of said yelding means.

12. In apparatus of the character described, a conveyor including spaced chain belts, rods extending between corresponding links of the belts, curved plates fixed to said rods and extending outwardly from the belts, said plates being shaped to rearwardly curve envelopes delivered thereto, complementary curved plates pivotally mounted on the rods and having rocker arms extending inwardly from the belts, spaced cams engageable by said arms to rock the pivotally mounted plates at envelope receiving and discharging stations, and a dryer housing enclosing the conveyor between the receiving and discharging stations.

13. The method of drying the gummed flaps of envelopes comprising bending the freshly gummed flaps backwardly, and passing the envelopes through a drying zone with the flaps bent as described.

In testimony whereof we affix our signatures.

ALFRED WINKLER.
MAX DÜNNEBIER.