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1,606,554

CONSTRUCTION OF ENVELOPE FLAP GUMMING AND DRYING MACHINES

Filed Jan. 2, 1925

2 Sheets-Sheet 1

Fig. 1.

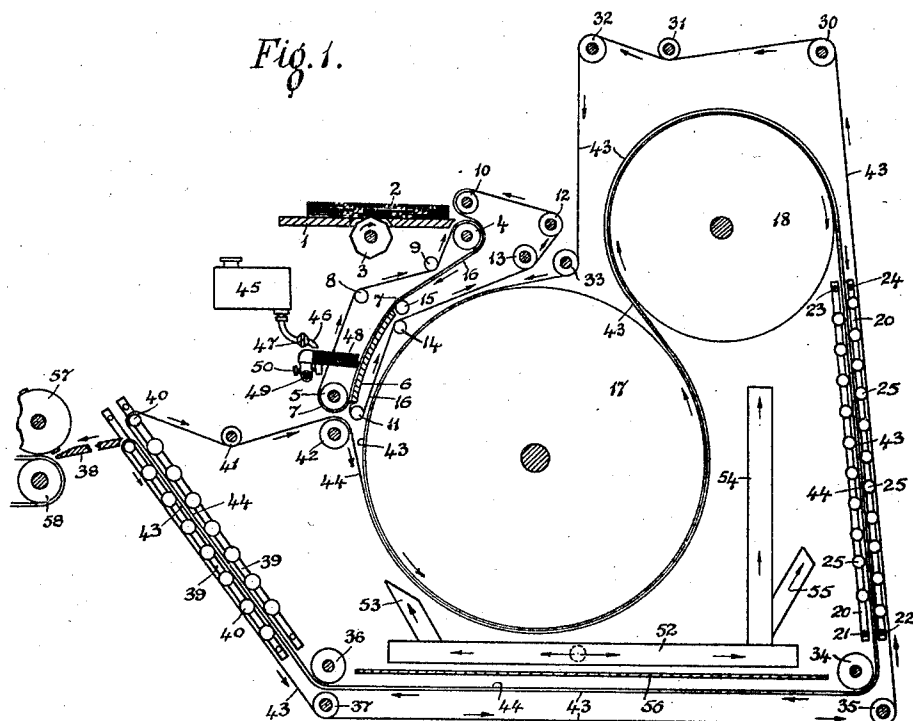
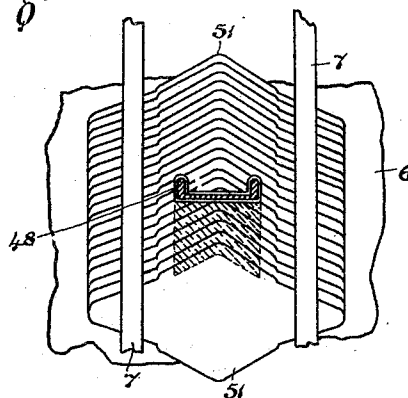


Fig. 2.



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Fig. 3.

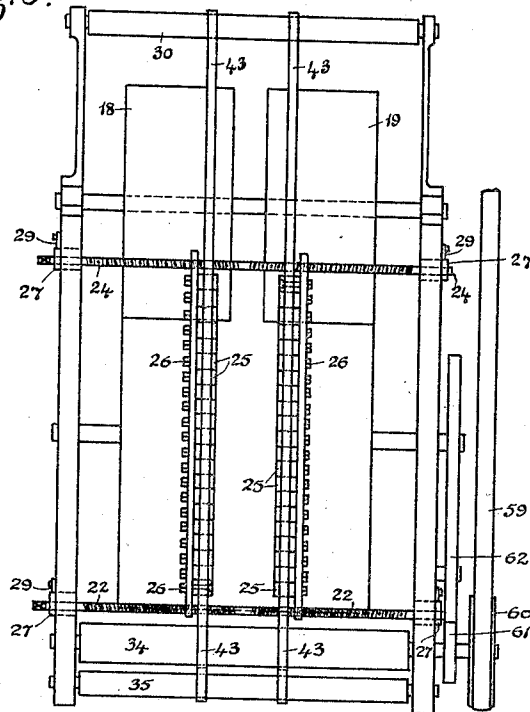
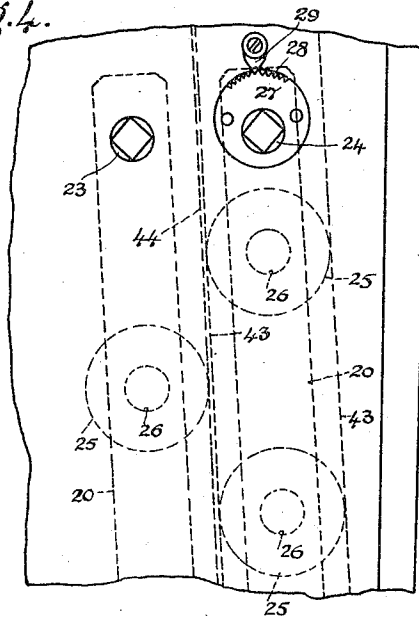


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CONSTRUCTION OF ENVELOPE FLAP GUMMING AND DRYING MACHINES.

Application filed January 2, 1925, Serial No. 223, and in Great Britain June 16, 1924.

This invention relates to a machine for gumming the flaps of envelope blanks whilst they are being passed against the gummer in a spaced out or fanned condition, the spaced out envelope blanks, after being gummed and dried, being delivered to the folding mechanism with the gummed side upwards.

The chief object of the invention is to construct such an apparatus wherein the envelope blanks will be gummed and the gum will be dried more quickly than in machines of this character as heretofore constructed.

According to this invention the apparatus is so constructed that the envelope blanks are fed between the tapes in a spaced out or fanned condition, and the flaps are gummed whilst being carried by the tapes in such condition, after which they are carried by the tapes around drums and then between perpendicularly arranged opposed rollers, around a roller and under a plate between a set of angularly positioned opposed rollers to the feed board of the envelope making machine.

A chamber containing a source of heat is positioned beneath the drums and above the plate and flues extending upwardly from said chamber adjacent its opposite ends deliver heat to the drums and to the perpendicularly arranged set of rollers and heat the envelope blanks as they are carried around and between the drums and between the perpendicularly arranged set of rollers so that such heat will efficiently dry the gum before each blank passes under the plate, whereby all cockling of the flap or cracking of gum is obviated and each blank is presented to the envelope making machine in a perfect condition.

The sets of rollers which are adjustable acting on the tape, will grip the blanks tightly and efficiently prevent any slip during the travel of the tapes either downwards or upwards.

The invention will be more clearly understood from the following description aided by the annexed drawings in which—

Figure 1 is a diagrammatic side elevation showing the approximate position of the various tapes, drums, rollers, feed and gumming appliances, the frame being omitted for sake of clearness.

Figure 2 is a front elevation of a portion

of the machine, slightly larger in scale than Fig. 1, at the point where the gumming is effected and showing a plurality of envelopes carried by the tapes past the gummer; the gummer being shown in section.

Figure 3 is an elevation of the rear end of the machine.

Figure 4 is a view on an enlarged scale of the upper ends of a pair of opposed bars carrying opposed rollers showing a means for adjustment of one of said bars toward and from its opposite bar to determine the grip or pressure on the tapes and blanks to suit the thickness of the paper being used.

Two sets of endless tapes are employed, each set being in duplicate between which the blanks are gripped on each side, as will be understood from Figure 2, the blanks passing from between one duplicate set of tapes to the other duplicate set.

1 is a feed board mounted on the machine and carrying the pile of blanks 2 which are spaced or fanned out by the roller 3 driven by suitable mechanism, as is well known.

At the delivery end of this feed board 1 is positioned a roller 4 and below same, but in a different vertical line is positioned another roller 5 and a curved wall 6 is positioned between these two rollers 4, 5.

Over these two rollers 4, 5 run two endless tapes, one 7 being shown in Figure 1, other rollers 8, 9 being employed to guide the tape 7, and either or both of these rollers 8, 9 can act as jockey rollers to take up any stretch of the tapes.

Above the roller 4 there is provided another roller 10 and at the lower end of the wall 6 is positioned another roller 11, these rollers 10, 11 with other rollers 12, 13, 14, 15 carrying two endless tapes, one of said tapes 16 being shown in Figure 1, and the tapes 7 and 16 travel in superposed relation over the roller 4, then over the roller 15 past the curved wall 6 and leave one another at the rollers 5, 11.

Behind the rollers just referred to are positioned three drums, 17, 18, 19 the two drums 18, 19 being coaxially mounted with their adjacent ends a distance apart and above and slightly behind the other roller 17.

Back of the drums 18, 19 are positioned two pairs of opposed bars 20 engaged at their upper and lower ends by left and right handed screw threaded rods 21, 22, 23, 24

held in bearings in the frame of the machine. Each bar has rollers 25 along its entire length, which rollers revolve on stub axles 26. The rollers carried by one bar are in staggered relation to those carried by the

opposing bar as will be understood from Figures 1 and 4.
The ends of the screw threaded rods 21 and 23 or 22 and 24 are each mounted in an eccentric bearing 27 positioned in the frame of the machine so that the two bars on each of such rods and the rollers carried by such bars can be moved toward and away from the other bars and rollers carried by the latter to ensure a proper grip on the endless tapes as the latter pass between the rollers as hereafter described. Catches 29 engaging notches 28 in the edges of the eccentrics secure the eccentrics and the rods carried by same in adjusted position.

Above the drums 17, 18, 19 are mounted three rollers 30, 31, 32 and just above the roller 17 is mounted another roller 33, and at the lower portion of the machine behind and in front of the drums are mounted rollers 34, 35, 36, 37. Positioned in advance of the rollers 36, 37 and leading to the feed board 38 of the envelope making machine are two pairs of opposed bars 39 having rollers 40 mounted thereon in the same manner as the rollers 25 are mounted on the other bars 20. The upper and lower ends of one of each of the pairs of bars 39 is provided with the same means for ensuring grip on tapes passing between the same as the other bars.

Other rollers 41, 42 are positioned between the upper ends of the bars 39 and the drum 17. A pair of tapes 43 pass around the drum 17, between the drum 17 and the drums 18 or 19, between the bars 20, around rollers 34, 36 between the bars 39 and around uppermost roller of one bar 39 rollers 37, 35, 30, 31, 32, 33 and back to drum 17. Another pair of tapes 44 meet the tapes 43 below the lower end of the wall 6 and pass in superposed relation with the tapes 43 around the drum 17 and the drum 18 or 19, between bars 20, around the rollers 34, 36, upper roller of bars 39 and rollers 41, 42 where they separate from the tapes 43 and pass around the drum 17.

The gum or paste is contained within a vessel 45 supported from the frame of the machine and such vessel 45 is provided with a spout 46 having a valve 47 for regulating the output. The spout 46 delivers gum to an inclined trough 48 pivoted to an arm 49 on the frame of the machine and angularly adjustable by a screw 50.

The trough 48 is covered with felt and its open mouth engages the blanks 51 as they pass the same.

Under the drums is positioned a chamber 52 containing a heating medium, such as a

gas burner and such chamber is provided with flues 53, 54, 55 extending upwardly from its opposite ends for disseminating the heat from the gas flames to the drums and the envelope blanks.

Under the chamber 52 is a plate 56 forming a shield for the blanks as they are carried by the tapes 43 and 44 beneath the chamber 52 so as to prevent cockling or cracking of the gum.

The drum 17 has its ends preferably closed.

57, 58 are the feed rollers for delivering the blanks to the envelope making machine which is not shown, but is of any usual construction, 59 is a belt from a prime mover or gear driving the pulley 60 gear wheels 61, 62, 63 and drum 17, but any system of drive may be adopted.

In the operation of the machine the centre line of the blank is always substantially coincident with the centre line between the sets of tapes and the tapes are adjusted toward and away from one another according to the width of blank.

Assuming that the distance between the tapes has been adjusted by hand and that the bars 20, 39 have also been adjusted to coincide with the tapes and also that the opposed bars 20 and 39 have been adjusted to exert pressure on the tapes to suit the thickness of the paper, the machine is ready for work. The envelope blanks from the pile 2 are fed in a spaced or fanned out condition by the spacing feed roller 3 in the usual manner between the rollers 10, 4 where they are gripped between the tapes 7, 16 and carried down in spaced condition past the wall 6 where the gum is constantly applied, the blanks travelling between the tapes 7 and 16 are conveyed by the rollers 5, 11 over the roller 42 and delivered between the tapes 43, 44 and carried between these tapes around the drums 17, 18, 19 with the gummed portions bridging the space between the adjacent ends of the drums 18, 19, then down between the rows of rollers 25, then around the roller 34, under the shield 56 around roller 36, and up between the rows of rollers 40 and are delivered to the feed board 38 of the envelope making machine to be moved by the feed rollers 57, 58 into such machine.

The uprising heat from the chamber 52 and flues 53, 54, 55 will pass around the drums 17 and 18 and 19 to impart heat thereto and will also act directly upon the gummed portions which are outside whilst passing around the drum 17 and also on the gummed portions directly whilst such gummed portions are travelling over the drums 18, 19, and between the bars 20 and rollers 25. By the time each gummed flap reaches a position midway of the bars 20 the gum is properly dry and moving into a cooler atmosphere and, since the gum on the blanks is protected

by the shield 56, the gum will not dry to such an extent as to cause a cracking or a cockling of the flap.

The grip between the tapes as they pass 5 around the drums and between the rollers 25, 40 is sufficient to prevent any slip or alteration of position of the blanks with regard to each other and the timing of the drum 17 and the feed wheels 3, 57, 58 are 10 in unison, that is to say, the feed to the gumming and drying machine is in the same ratio as the feed of the blanks to the envelope making machine.

In Figure 2 the gummed portions of the 15 blanks are shown in etched lines.

The tapes are adjusted relatively to one another on the rollers and drums by hand.

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

20 1. Apparatus for gumming and drying the flaps of envelope blanks whilst in a spaced out or fanned position and feeding the gummed blanks direct to the envelope making mechanism comprising a blank feed- 25 ing device, a roller, a pair of coaxially mounted rollers of equal diameter having their adjacent ends spaced apart and each having its periphery in close proximity to the periphery of said first-named roller, a 30 series of tapes arranged in cooperating pairs between which envelope blanks are received and conveyed through said apparatus, each of said cooperating pairs of tapes passing between the peripheries of said first-named 35 roller and one of said spaced rollers, a series of rollers arranged in opposed relation in advance of said first-named roller, a second series of rollers arranged in opposed relation at the rear of said spaced rollers, said 40 opposed rollers engaging and gripping the tapes and blanks whilst passing downwards

and upwards through the apparatus, a gum- 45 ming appliance for gumming the flaps of the blanks, means for applying heat to the drums and envelope blanks to dry the gum, said tapes, rollers and drums being so related that the blanks are delivered to the envelope making machine with the gummed side up- wards.

2. In apparatus for gumming and drying 50 the flaps of envelope blanks whilst in a spaced out or fanned condition and feeding the gummed blanks direct to an envelope machine as claimed in claim 1, a pair of bars for guiding each pair of tapes, each of such 55 bars having rollers thereon the rollers on respective bars being opposed to each other, one bar being adjustable with regard to the other to determine the degree of grip of the rollers on the pair of tapes to accommodate 60 the thickness of paper used.

3. In apparatus for gumming and drying envelope blanks the combination of a mech- 65 anism for feeding blanks with an edge of each blank projecting beyond the corresponding edge of the blank immediately above it, means for applying gum to the flaps of said blanks, spaced pairs of tapes between which the blanks are gripped and 70 carried through the apparatus, said pairs of tapes engaging the blanks at opposite ends of the gummed portions thereof, a roller over which said blanks are passed for initially warming and drying the gummed portions thereof, and a pair of secondary rollers en- 75 gaging said blanks at opposite ends of the gummed portions thereof.

In testimony whereof we have hereunto set our hands.

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