APPARATUS FOR GUMMING THE FLAPS OF ENVELOPES OR BAGS

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This invention relates to the gumming of the flaps of envelopes or bags and more particularly to apparatus for use in conjunction with envelope or bag making machines of the type in which the bags are manufactured from sheet material fed over a former and then brought to tubular form and cut into the appropriate envelope or bag design. The invention is also particularly useful in combination with apparatus which receives the envelope or bag sections successively from the base closing stage and reverses the positions of the individual envelopes or bags so that instead of their base-closed ends leading, their flaps are leading and the envelopes or bags are superposed to form a continuous chain or line of envelopes or bags with their flaps exposed the predetermined amount for gumming.

The chief object of the present invention is to provide an improved method of gumming the flaps of envelopes or bags. Another object of the present invention is to provide an apparatus which can be erected above the envelope or bag making machine so that its use will not add to the floor space involved for the assembly of a complete set of apparatus which shapes and gums envelopes or bags so that they issue ready for use.

The present invention contemplates arranging the envelopes or bags on conveying means in such manner that they form a continuous chain or line with their flaps exposed on one face the amount to be covered by gum, whereby a continuous gumming surface is presented to gum applying means and this can be effected by means of a conveyor adapted to maintain the envelopes or bags in overlapping relationship and in a continuous chain or line with their flaps presenting a continuous face to gumming means, the said gumming means being located in juxtaposition to one track of the conveying means, and means being provided to convey the gummed envelopes or bags continuously from the gumming stage to a delivery point.

In order that the invention may be clearly understood and readily carried into effect, drawings are appended hereto illustrating an embodiment thereof, and wherein:

Fig. 1 is an elevation view of one end of the apparatus, and
Fig. 2 is an elevation view of the other end of the apparatus, these two views being separated for economy of space, but in practice making a single apparatus.

Fig. 3 is a diagrammatic sectional view showing a bowed delivery conveyor and
Fig. 4 is a diagrammatic inverted plan view showing how the envelopes are arranged with their flaps presented to the gumming means.

Referring to the drawings the apparatus for gumming the envelopes is erected upon a substantially L-shaped lattice girder frame 1, which has a depending entry end section 2 carrying a suitable conveying means for lifting the envelopes from a feeding stage 3, to the upper horizontal portion of the frame which contains means for conveying the envelopes to a gumming stage 4 at the other end of the frame.

The envelopes are arranged in a continuous stream or line overlapped in such manner as to expose their flaps wholly or partially on one face. This line of envelopes is indicated at the feeding stage by the heavy line 5 and it will be seen that the envelopes are carried in a continuous line upwardly between a conveyor belt 6 having one track located close to and concentric or parallel with another track of an endless belt 7, these two tracks being guided in the desired upward direction by means of a guiding plate 8. The said track of the belt 6 is carried over a drum 9 and the said track of the conveyor 7 is conveyed over a roller 10 in juxtaposition to the periphery of the drum 9. By this means the line or chain of envelopes is carried over the drum 7 on to the upper track of the lower of two conveyors 11 and 12. The lower conveyor 11 has its entry end in juxtaposition to the drum 9, and the envelopes are assisted on to it by a supplementary roller 13 located close to the peripheries of and between the drum 9 and a cylinder 14 over which the appropriate end of the conveyor 11 travels. The lower track of the conveyor 12 is parallel with and close to the upper track of the conveyor 11, and these two conveyors extend longitudinally along the horizontal or overhead part of the lattice girder frame 1. Also the direction of travel of these two conveyors is indicated by arrows. The return ends of these two conveyors are determined by the cylinders 15 and 16 which are located in juxtaposition to the gumming stage 4.

The chain or line of envelopes as it issues from between the two cylinders 15 and 16 enters between the lower track of a specially shaped conveyor 17 and the upper track of an endless brush 10 which has gum transferred to it from a reservoir 19. The conveyor 17 comprises two laterally spaced tapes or belts which engage the marginal longitudinal parts of the
envelopes and press the flaps of the envelopes which are presented face downwards against a longitudinal pair of guide rails 20 located parallel with and on opposite sides of the upper track of the endless brush 18.

The brush covers the desired width of the envelope flaps to be gummed and the depth of gumming is determined by the extent of overlap of the envelopes, Fig. 4, showing how the envelopes are overlapped to present the desired area of inner face of each envelope. The parallel guide rails 20 support the envelopes as they issue from the gumming stage and directs the line of envelopes on to the entry end of an endless conveyor 21 which is guided tautly over half the circumference of a drum 22 supported by suitable bearings at one end of the frame 1. Suitable adjustable or jockey pulleys 23 maintain the desired tension in the conveyor 21. This conveyor 21 is preferably a pair of laterally spaced parallel belts which engage the marginal longitudinal parts of the envelopes so as not to contact with the gummed envelopes issue from the drum 22 they are delivered on to the upper track of an endless conveyor 24, such upper track being located between guide rails 28 and 28a which extend to the other end of the frame 1 where the envelopes can be delivered in any suitable collecting means. The upper rails 28a are in duplicate and engage the edges of the envelopes on opposite sides of the gummed portion of the flaps.

The distance of travel of the envelopes along the frame 1 is useful because advantage can be taken thereof for the purpose of drying the gum on the envelope flaps and also thoroughly drying the envelopes before they reach the gumming stage, and for this purpose suitable heaters may be arranged in juxtaposition to the tracks of the conveyors which engage the envelopes.

The gumming apparatus is self-contained being adapted to gum the envelope flaps between the broken lines 9a indicated in Fig. 4 and being supported upon a suitable frame 22a which can be part of the normal envelope or bag making machinery. The conveyors 11 and 12 are supported at their upper tracks by horizontal rails 26 and 27 respectively.

The frame 1 can be supported in juxtaposition to the delivery end of the conveyors 11 and 12 by means for effecting fine adjustments of the position of the frame. This means can comprise one or a pair of cams 30 on which rests rollers 31 on the adjacent parts of the frame 1. Any suitable means being provided to lock the cams 30 in selected position. Likewise the cams 30 can be provided with regulating means for lifting the conveyors 17 clear of the endless brush 18 for the purpose of effecting replacements or repairs or for removing distorted or displaced envelopes or otherwise affecting appropriate adjustments. The other end of the frame is suitably supported by substantial bearings or pivots 35 to provide for this adjustment.

The conveyor 24 which delivers the gummed envelopes carries them past a drying zone and is preferably arranged so that its upper surface is bowed or suitably shaped by bending the guide rail 25 transversely and the guides 25a act as skids arranged along each edge of the conveyor to engage the edges of the envelopes clear of the gummed parts so that the envelopes are correspondingly bent or bowed with the object of preventing curling of the gummed flaps and also to prevent displacement of the envelopes at high speeds.

The rate of travel of the brush 18 is greater than the rate of travel of the chain of envelopes so that the flaps of the envelopes are maintained in proper overlapping relationship and adequately gummed. Also the rate of travel of the roller 22 and conveyor 21 is greater than the rate of travel of the envelopes at the gumming stage, whereby the envelopes are given a slight relative longitudinal separation as they pass to the drum 22 and consequently all their gummed areas are adequately separated when the envelopes pass on to the upper track of the conveyor 25. By this means the envelopes are prevented from sticking together whilst being dried.

The normal envelope or bag making machinery is indicated by the various sections 33 so it will be seen that by means of the present invention there is provided apparatus which can be erected for the purpose of gumming the flaps of envelopes or banded areas as not to contact with the gummed flaps exposed as an uninterrupted surface and traversing the line of envelopes endwise each with an ungummed flap at one end, gumming the exposed areas of the flaps during their translative movement, reversing the direction of travel of the line of envelopes or bags and bending the gummed flaps away from each other while maintaining their travel after their flaps have been gummed in a shaping machine without however increasing the floor space necessary for such additional operation. The present invention also provides a method of gumming which ensures uniformity and continuity in the gumming operation so that on a foreseeable speed up in production is obtained.

I claim:

1. An improved method of gumming the flaps of envelopes or bags in the manufacture of envelopes or bags consisting in arranging the envelopes or bags in overlapping relationship in a continuous line with predetermined areas of their flaps exposed as an uninterrupted surface and traversing the line of envelopes endwise each with an ungummed flap at one end, gumming the exposed areas of the flaps during their translative movement, reversing the direction of travel of the line of envelopes or bags and bending the gummed flaps away from each other while maintaining their travel after their flaps have been gummed in a shaping machine without however increasing the floor space necessary for such additional operation.

2. Apparatus for gumming the flaps on envelopes or bags comprising a pair of conveyors with opposed parallel tracks, means for delivering the envelopes or bags in a continuous line and in an overlapping manner between said tracks, a gumming device at the delivery end of the said conveyors adapted to gum the exposed flaps of the envelopes or bags, further conveying means adapted to feed the envelopes or bags in an overlapping relationship over the gumming device, a still further conveyor acting as a discharge conveyor located in spaced relationship above and substantially parallel with the before said parallel pair of conveyors, and means to traverse the envelopes or bags away from the gumming device on to the said discharge conveyor so as to reverse the direction of travel of the envelopes or bags after gumming their flaps.
3. In an envelope or bag making machine gumming apparatus for gumming the flaps of the shaped envelopes or bags, a frame supporting said gumming apparatus and arranged above the machine, a depending extension at one end of the frame, conveying means supported by said depending extension adapted to elevate and convey the envelopes or bags to the gumming apparatus, a gumming apparatus comprising gumming means, a conveyor and means therewith adapted to maintain the envelopes or bags in overlapping relationship and in a continuous chain or line with their flaps presenting a continuous face to said gumming means, the said gumming means being located in juxtaposition to one track of the conveying means, and means to convey the gummed envelopes or bags continuously from the gumming stage to a delivery point.

4. In an envelope or bag making machine gumming apparatus for gumming the flaps of the shaped envelopes or bags, a frame supporting said gumming apparatus and arranged above the machine, a depending extension at one end of the frame, conveying means supported by said depending extension adapted to elevate and convey the envelopes or bags to the gumming apparatus, said gumming apparatus comprising gumming means, a conveyor and means therewith adapted to maintain the envelopes or bags in overlapping relationship and in a continuous chain or line with their flaps presenting a continuous face to said gumming means, the said gumming means being located in juxtaposition to one track of the conveying means, means to convey the gummed envelopes or bags continuously from the gumming stage to a delivery point, and means to adjust the frame relative to the gumming means for separating the envelope or bag conveying means from the gumming means.

5. In an envelope or bag making machine gumming apparatus for gumming the flaps of the shaped envelopes or bags, a frame supporting said gumming apparatus and arranged above the machine, a depending extension at one end of the frame, said depending extension being pivot- ed to the machine, conveying means supported by said depending extension adapted to elevate and convey the envelopes or bags in an overlapping chain to the gumming apparatus, said gumming apparatus comprising a pair of conveyors with opposed parallel tracks adapted at one end to receive between them the chain of envelopes or bags from the beforeaid conveying means, a gumming device at the other end of said conveyor tracks adapted to gum the flaps of the envelopes or bags, a still further conveyor acting as a discharge conveyor located in spaced relationship above said pair of conveyors, means to traverse the envelopes or bags away from the gumming device on to said discharge conveyor so as to reverse the direction of travel of the envelopes or bags after gumming the flaps, heating means on the said frame for drying the gummed flaps, and means remote from the said support of said frame to adjust the frame about its pivotal support relatively to the gumming device.

6. Apparatus for gumming the flaps on envelopes or bags comprising a pair of conveyors with opposed parallel tracks, means for delivering the envelopes or bags in a continuous line and in an overlapping manner between said tracks, a gumming device at the delivery end of the said conveyors adapted to gum the exposed flaps of the envelopes or bags, further conveying means adapted to feed the envelopes or bags in overlapping relationship over the gumming device and a still further conveyor adapted to receive the envelopes or bags with gummed flaps and to convey them away to a discharge zone, said latter conveyor being bowed transversely so as to bow the envelopes or bags thereon to counteract the curling tendency of the gummed flaps.

7. Apparatus for gumming the flaps on envelopes or bags comprising a pair of conveyors with opposed parallel tracks, means for delivering the envelopes or bags in a continuous line and in an overlapping manner between said tracks, a gumming device at the delivery end of the said conveyors adapted to gum the exposed flaps of the envelopes or bags, further conveying means adapted to feed the envelopes or bags in overlapping relationship over the gumming device and a still further conveyor adapted to receive the envelopes or bags with gummed flaps and to convey them away to a discharge zone, said latter conveyor being bowed transversely so as to bow the envelopes or bags thereon to counteract the curling tendency of the gummed flaps, and longitudinal skids disposed above the bowed conveyor and adapted to engage the longitudinal marginal parts of the envelopes or bags to maintain them bowed.

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