271-270. OR 2,287,719 SR

40

June 23, 1942. H. H. BEASLEY 2,287,719

ARRANGING AND FEEDING ENVELOPES OR BAGS FOR GUMMING THE FLAPS

Filed July 5, 1941 2 Sheets-Sheet 1

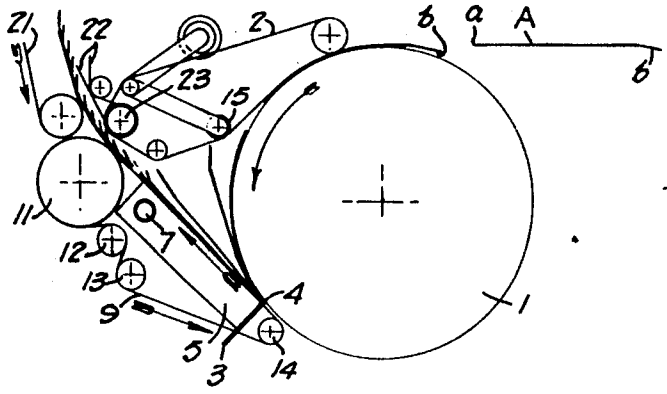


FIG. 1.

31271

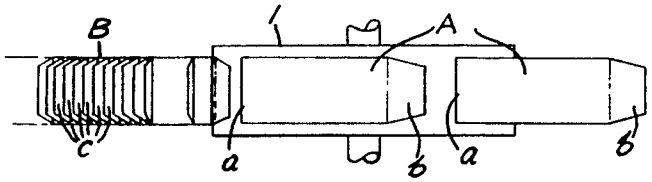
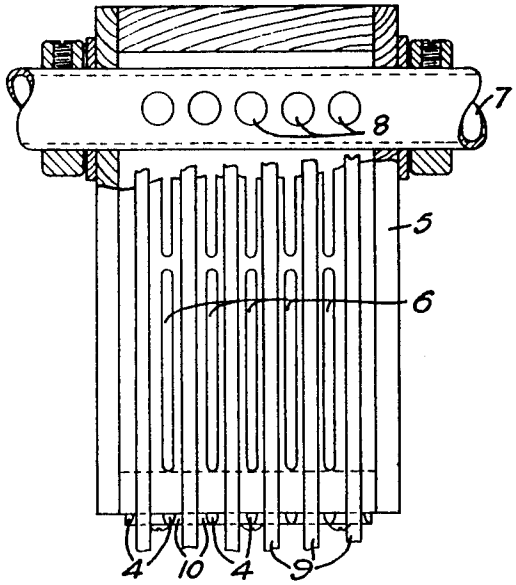


FIG. 2.

FIG. 4.



INVENTOR
H. H. BEASLEY.
BY
Rayner & Co
ATTORNEY

June 23, 1942. H. H. BEASLEY 2,287,719

ARRANGING AND FEEDING ENVELOPES OR BAGS FOR GUMMING THE FLAPS

Filed July 5, 1941 2 Sheets-Sheet 2

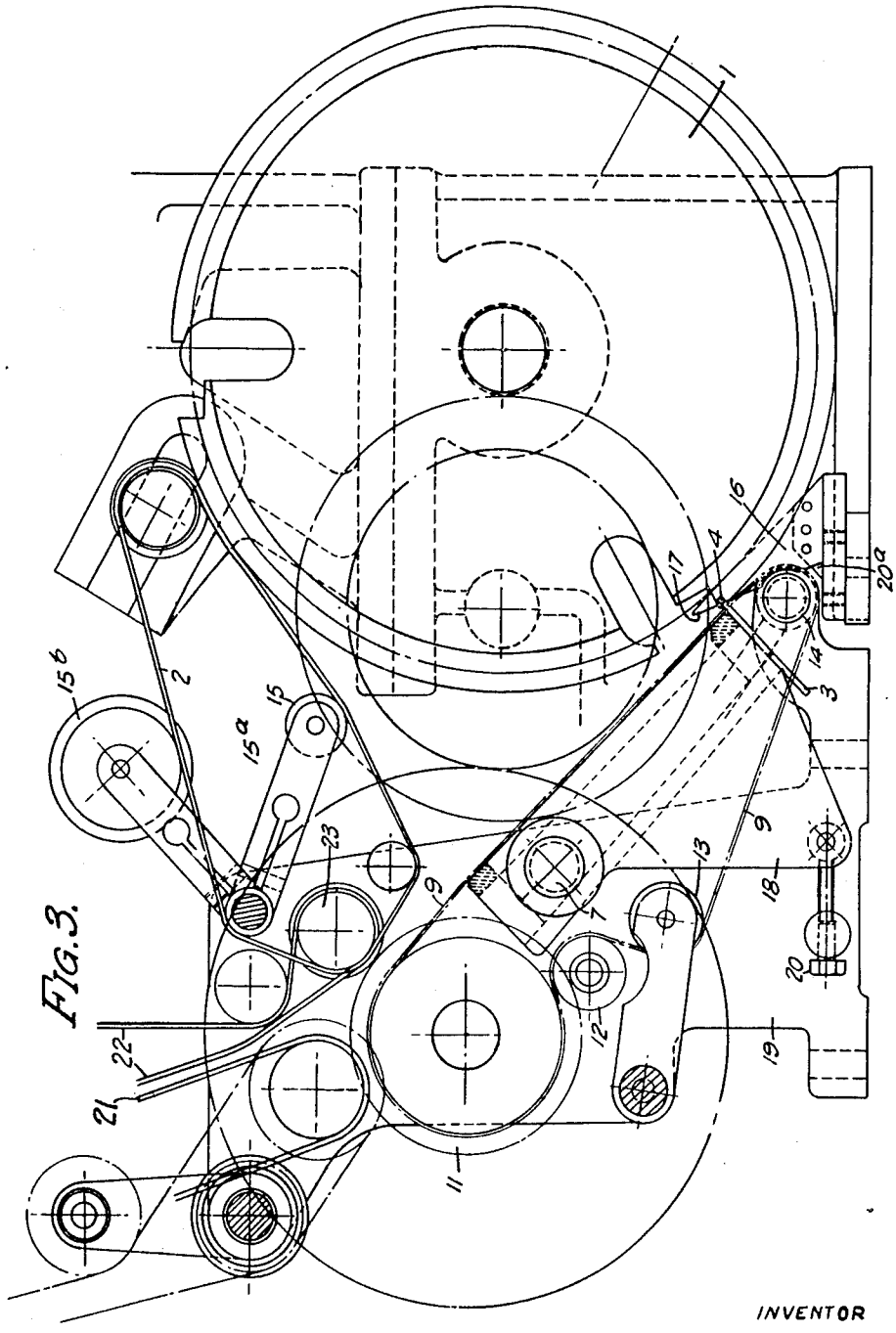


FIG. 3.

INVENTOR
H.H. BEASLEY.
BY Raymer Co
ATTORNEY

UNITED STATES PATENT OFFICE

2,287,719

ARRANGING AND FEEDING ENVELOPES OR BAGS FOR GUMMING THE FLAPS

Harold Holmyard Beasley, Ashton Gate, Bristol, England

Application July 5, 1941, Serial No. 401,210
In Great Britain June 20, 1940

9 Claims. (Cl. 271—8)

This invention relates to machines for making envelopes or bags, more particularly to machines in which the envelopes or bags are made from lengths of tubular material and closed at their bases before the flaps are folded over and gummed. The object of the present invention is to provide improved means for gumming the envelope flaps so that they can be gummed uniformly in quantities commensurable with the rate of delivery of the machine. Another object of this invention is to simplify and improve upon the means for feeding the envelope sections to the gumming stage. A further object of this invention is to provide an apparatus which can be readily fitted to existing envelope making machines for the purpose of transferring the envelopes following the closure of their bases to means for applying gum to the flaps and in doing so to adjust the envelopes in such manner as to enable a continuous gumming operation to be effected as distinct from the intermittent gumming of the flaps as the envelopes issue from the shaping mechanism, so that a smooth, accurate and rapid sequence of operations is possible on one machine.

The usual practice with the manufacture of bag type envelopes or bags is to feed sheet material over a former to bring it to tubular form and then to cut it into lengths so as to provide at one end of each envelope length a flap to form the base, and at the other end a flap for closure purposes, the base flaps being folded over and sealed, and thereafter the envelopes being fed to suitable means for gumming the flaps. The usual means for gumming the flaps involves a complicated or slow method which impedes production, and also takes up a large amount of floor space for the machine, and an object of the present invention is to provide an attachment which obviates these disadvantages and rearranges the envelope or bag sections after their bases have been closed in the manner appropriate to gumming the flaps without idle intervals, so that a continuous process is provided.

Another object of the present invention is to provide means adapted to reverse the envelope sections during their travel from the base closing stage to the gumming stage, such reversal consisting in making the trailing ends at the base sealing stage into the leading ends at the flap gumming stage, whereby the normal practice of folding over the leading ends of the envelope sections to close the bases can be maintained without interrupting the continuity of operation of the machine for the purpose of subsequently applying gum to the other ends of the envelope sections to produce gummed flaps.

A suitable embodiment of the invention comprises an attachment which is located in juxtaposition to the usual take-off cylinder, this cylinder taking off the envelope or bag sections as their bases are closed. The attachment makes use of this cylinder for the purpose of conveying the envelopes or bags to a reversing device, and for this purpose the envelopes or bags are maintained in contact with the periphery of the cylinder by suitable means until their leading ends successively engage an abutment, whereupon the envelopes or bags are drawn by suction against conveying means travelling in a direction counter to the direction of travel of the envelopes or bags towards the said abutment, so that the leading ends of the envelopes or bags which engage the abutment now become the trailing ends. The rate of travel of this conveying means is adjusted in relation to the peripheral speed of the cylinder in such manner that the envelopes will overlap each other with their flaps foremost, the amount of overlap being the full length of each envelope less the depth of gumming area of each flap.

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

Fig. 1 is a diagrammatic side elevation view showing the method of overlapping the envelope sections.

Fig. 2 is a diagrammatic plan view showing the change in relationship of the envelopes at the base closure delivery stage and at the reversing stage.

Fig. 3 is a side elevation of the reversing mechanism, and

Fig. 4 is a detail upper face view of the suction device of such mechanism.

Referring to the drawings the envelope sections which issue from the machine as their bases are closed are indicated in Figs. 1 and 2 by the reference letter A, and the envelopes which are subsequently overlapped in a manner suitable for gumming their flaps are indicated by the reference letter B. It will be seen that the base sealed ends *a* of the envelope sections A are leading and the flaps *b* trailing with their sides to be gummed facing downwards as the envelopes pass to the usual take-off cylinder 1 provided with grippers in known manner, but that after they leave the cylinder 1 the envelopes overlap in staggered form with their flaps leading and their sides to be gummed facing upwardly, the extent of their overlap being such as to afford a continuous succession of transverse exposed flap area *c* to be gummed.

The envelopes are held at their leading ends by the gripper mechanism of the gripper cylinder, and the belt 2 acts to impel the trailing end of each envelope over toward the suction chamber so as to avoid the stream of envelopes jamming in the opening leading up between the belts

2 and 9. The individual envelopes maintain contact with the cylinder until their leading ends engage a transverse abutment 3 located near the lowest point of travel of the cylinder 1 on its descending face.

The said transverse abutment comprises a number of short teeth or fingers 4 projecting slightly into one or more circumferential channels in the said cylinder so as to form a positive stop located at the lower end of a suction box 5. This suction box 5 inclines upwardly away from the periphery of the drum (a suitable angle being in the neighbourhood of 45° to the horizontal), and it is formed with a number of parallel slots 6 in its upper face and is subjected internally to suction by being connected to a suitable source of suction by a transverse suction conduit 7 at its upper end provided with suction apertures 8. By this means each envelope will be drawn smartly towards the upper face of the box 5, the slotted area being such that it is adequately covered by a single envelope, yet affords sufficient area between the trailing end of the last received envelope and the next approaching envelope to suck the latter envelope into the correct predetermined position to ensure uniformity of overlap of the envelopes.

The envelopes are now conveyed automatically upwardly towards the gumming stage, and this is effected by means of a suitable number of narrow belts or tapes 9 (preferably rubber faced tapes) passing between the said slots (but not covering them) and guided in the channels 10 between the teeth 4 at the lower end of the suction box, these belts forming an endless conveyor which passes over a roll 11 in juxtaposition to the upper end of the box 5 and a grooved pulley 12 at the lower end. Suitable tensioning means such as a jockey pulley 13 co-operates with a further pulley 14 to maintain the conveyor 9 taut. Likewise a counter-weighted pulley 15 carried by an adjustable lever 15*a* weighted as at 15*b* can vary the length of contact of the belt or belts 2 with the periphery of the cylinder 1, and also maintains the tension of the belt or belts.

In addition to the abutment (teeth 4) at the lower end of the suction box two or other suitable number of wedge shaped plates 16 engage in the channels in the periphery of the cylinder 1 and their apices project upwardly slightly beyond the said abutment 4 to provide inclined edges 17 which positively guide the envelopes against the said abutment 4 and prevent the envelopes from curling and jamming between the cylinder 1 and the abutment.

Any suitable means may be provided for adjusting the inclination and position of the suction box 5 so that it is readily adjustable to ensure proper alignment with the rubber faced tapes 9. For this purpose the suction box can be supported by depending side brackets 18 journalled by suitable bosses and bolts to the frame 19 of the envelope reversing mechanism and located in position by one or more set screws or studs 20. Likewise, the said wedge shaped plates 16 can be translatively adjustable upon suitable supporting brackets 20*a*.

The appliance may be adapted to operate in such manner that the envelope sections may overlap on the said take-off cylinder although normally they would follow each other successively at intervals, in which event the rate of travel of the conveying bands 9 appropriate to the suction box 5 will be such as to ensure the envelopes being overlapped to an amount corresponding to the depths to which their flaps are to be gummed.

The endless conveyor (bands 9) appropriate to the suction box passes over its upper roll 11 in juxtaposition to a take-off belt 21 serving as an endless conveyor for conveying the overlapping envelopes to an overhead gumming stage, the overlapping envelopes spanning the gap between the two conveyors. Another endless conveyor 22 negotiates a roller 23 in juxtaposition to this gap thus maintaining proper bridging contact of the envelopes with the two conveyors 9 and 21, and this additional conveyor 22 is then brought into proximity and parallel with the said take-off conveyor 21 so that the envelopes are gripped between two travelling surfaces and conveyed upwards to the gumming stage.

By means of the present invention the rate of travel and accuracy or uniformity of the gumming of flaps of envelopes or bags is materially enhanced by mechanism which is readily adapted to existing machines or can form simple, relatively inexpensive additions or parts of new machines. The present invention is also particularly useful when adopted in conjunction with the overhead gumming means.

I claim:

1. Improved apparatus for arranging and feeding envelopes or bags as a preliminary step in gumming the flaps thereof in connection with envelope or bag making machines, comprising means adapted to reverse the envelope sections during their travel from the base closing stage to the gumming stage, such reversal consisting in making the trailing ends at the base sealing stage into the leading ends at the flap gumming stage, means automatically partially overlapping the reversed envelopes or bags in such manner that a continuous line of envelopes or bags is formed and predetermined areas of the flaps are exposed on one side of the line of envelopes or bags, and means automatically conveying the line of overlapped envelopes towards a flap gumming stage.

2. Improved apparatus for arranging and feeding envelopes or bags from the shaping to a flap gumming stage in envelope or bag making machines comprising a conveyor adapted to receive and traverse the shaped envelopes towards the flap gumming means, means adjacent the entry end of said conveyor to momentarily arrest the translative movement of each envelope from the envelope or bag shaping mechanism, and means co-operating with said arresting means to impart reversing movement to each envelope so that the trailing ends of the envelopes or bags at the shaping stage become the leading ends on the said conveyor and the reversed envelopes or bags partially overlap to expose a continuous line of flap areas for gumming.

3. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a belt conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes as the envelopes descend on face of said cylinder to momentarily arrest the translative movement of each envelope or bag, and suction means adapted during each such non-translative movement period to locate the appropriate envelope or bag against

said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor.

4. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes on the descending or delivery face of the cylinder to momentarily arrest the translative movement of each envelope or bag, means adapted during each such non-translative movement period to locate the appropriate envelope or bag against said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor, and means adapted to subject the envelopes or bags to pressure so as to press them firmly together in overlapping relationship when they are received by said conveyor.

5. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes on the descending or delivery face of the cylinder to momentarily arrest the translative movement of each envelope or bag, means adapted during each such non-translative movement period to locate the appropriate envelope or bag against said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor, and means adapted to subject the envelopes or bags to suction as they pass on to said conveyor so as to draw them close against such conveyor.

6. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes on the descending or delivery face of the cylinder to momentarily arrest the translative movement of each envelope or bag, means adapted during each such non-translative movement period to locate the appropriate envelope or bag against said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor, a suction chamber immediately subjacent to said conveyor and apertures in said suction chamber in close proximity to the track of the conveyor which receives the envelopes or bags to expose the envelopes or bags to the influence of suction so as to press the envelopes or bags together in close overlapping relationship when they are received by the conveyor.

7. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes on the descending or delivery face of the cylinder to momentarily arrest the translative movement of each envelope or bag, means adapted during each such non-translative movement period to locate the appropriate envelope or bag against said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor, said conveyor comprising a number of parallel endless belts, a suction chamber with one wall parallel with and close to the track of the conveyor which receives the envelopes or bags, and a number of lines of apertures in said wall exposed between said belts to expose the envelopes or bags to the influence of suction to press them in close overlapping relationship against the conveyor.

8. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to a flap gumming stage in envelope or bag making machines comprising a conveyor adapted to receive and traverse the shaped envelopes towards the flap gumming means, means adjacent the entry end of said conveyor to momentarily arrest the translative movement of each envelope from the envelope or bag shaping mechanism, means co-operating with said arresting means to impart reversing movement to each envelope so that the trailing ends of the envelopes or bags at the shaping stage become the leading ends on the said conveyor and the reversed envelopes or bags partially overlap to expose a continuous line of flap areas for gumming, and two conveyors with opposed parallel closely related tracks located with their entry end in juxtaposition to the delivery end of said conveyor and adapted to receive and grip the overlapping envelopes or bags at the delivery end of said conveyor for the purpose of maintaining the envelopes or bags in a continuous overlapping line and conveying them to the flap gumming stage.

9. Improved apparatus for arranging and feeding envelopes or bags from the shaping stage to the flap gumming stage in an envelope or bag making machine comprising a cylinder adapted to receive envelopes or bags passing from the shaping stage, a conveyor adapted to receive and traverse the shaped envelopes or bags towards the flap gumming stage, an abutment located so as to be engaged by the leading ends of the envelopes on the descending or delivery face of the cylinder to momentarily arrest the translative movement of each envelope or bag, means adapted during each such non-translative movement period to locate the appropriate envelope or bag against said conveyor so that the end of the envelope or bag remote from said abutment becomes the leading end on said conveyor, said conveyor comprising a number of parallel endless belts, a suction chamber with one wall parallel with and close to the track of the conveyor which receives the envelopes or bags, a number of lines of apertures in said wall exposed between said belts to expose the envelopes or bags to the influence of suction to press them in close overlapping relationship against the conveyor, and two endless conveyors with opposed closely related tracks adapted to receive between them and convey to the gumming stage the envelopes or bags delivered from the beforesaid parallel endless belts and one of them overhanging the delivery end of the said endless belts.

HAROLD HOLMYARD BEASLEY.