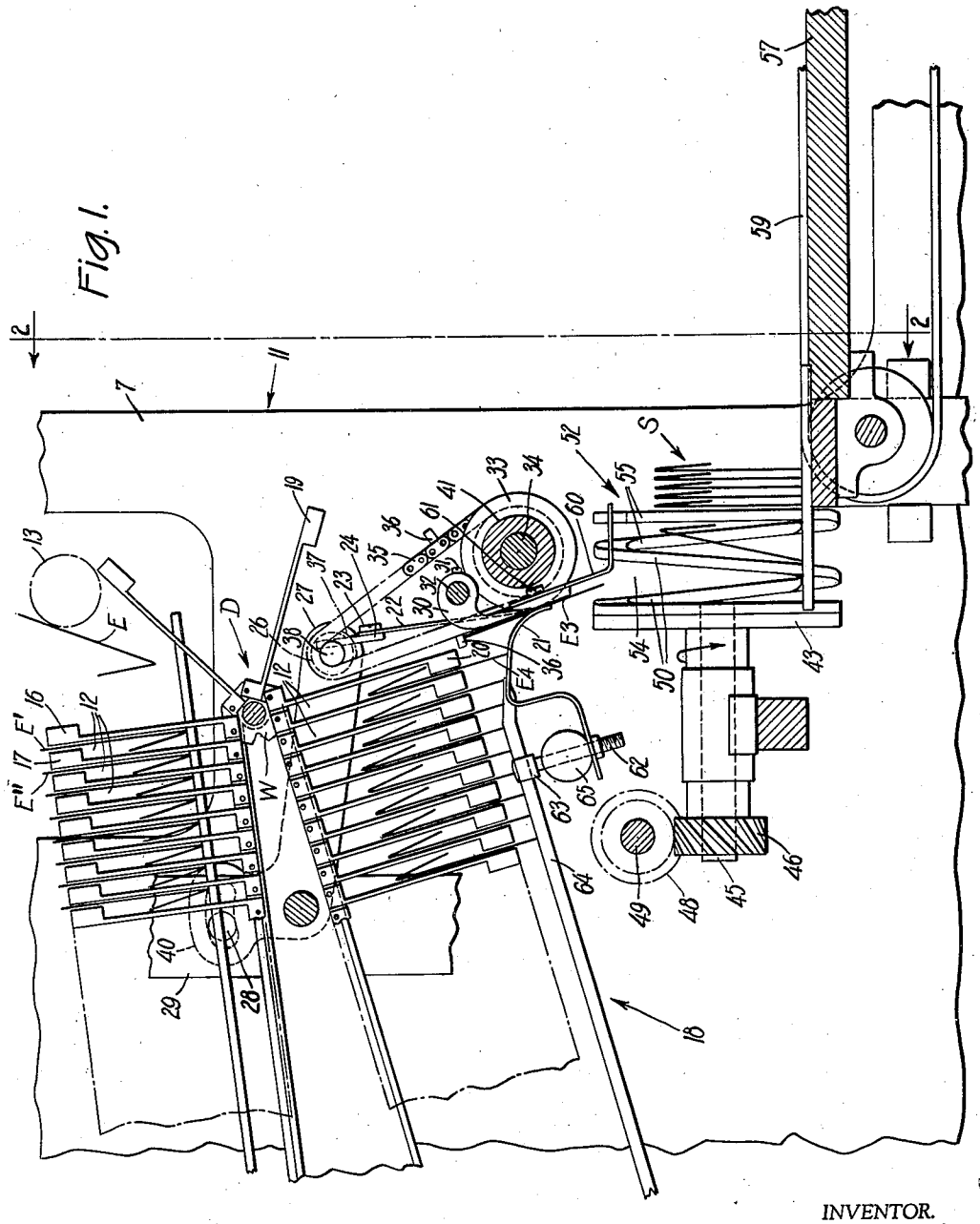
Feb. 25, 1941. A. NOVICK 2,232,720

DELIVERY MECHANISM

Original Filed Feb. 19, 1937 3 Sheets-Sheet 1

Fig. 1.



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DELIVERY MECHANISM

Original Filed Feb. 19, 1937 3 Sheets-Sheet 2

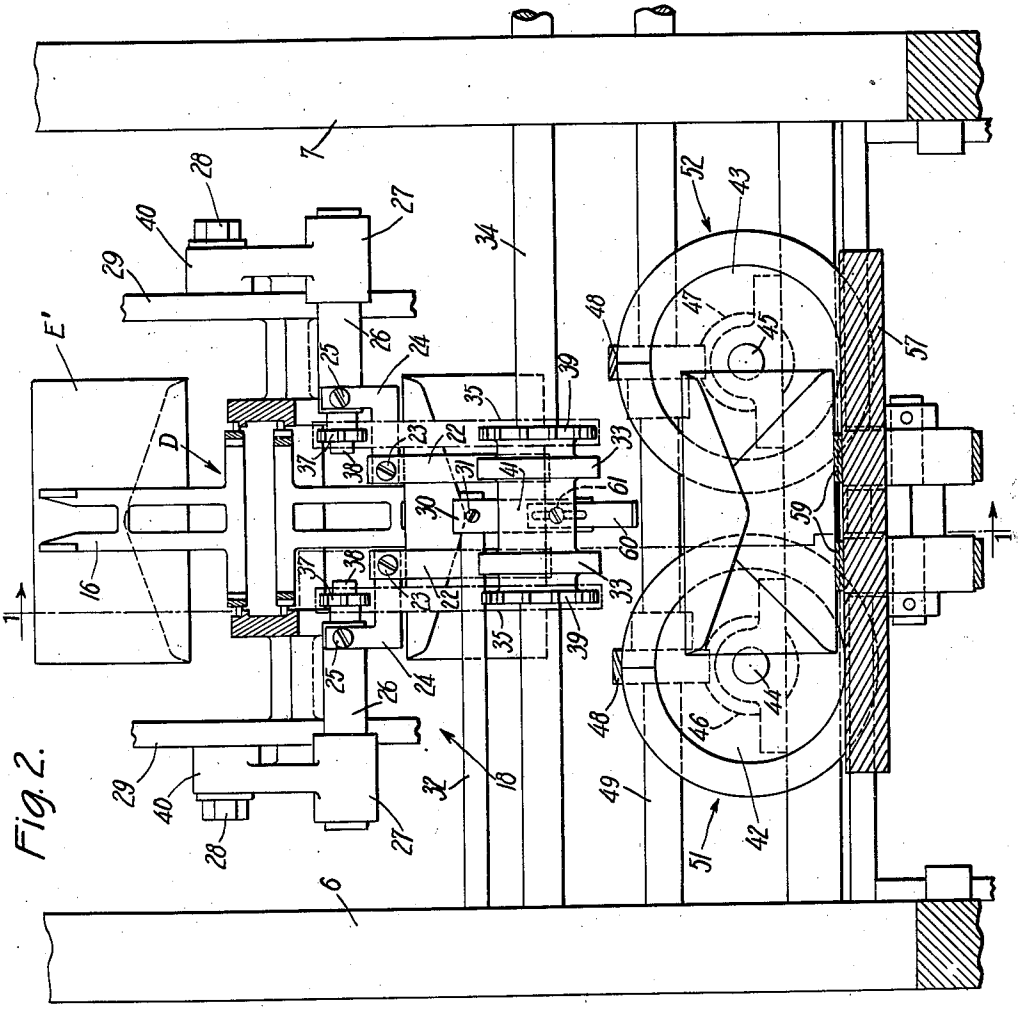


Fig. 2.

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Fig. 4.

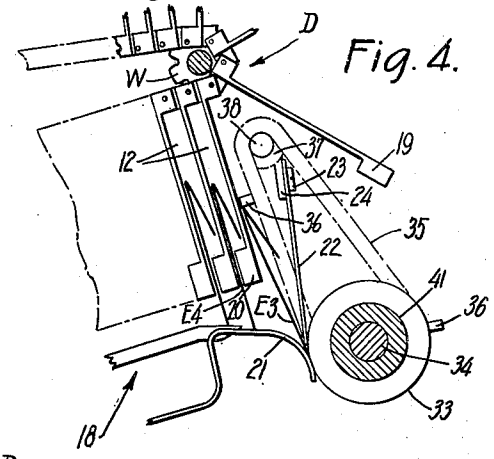


Fig. 3.

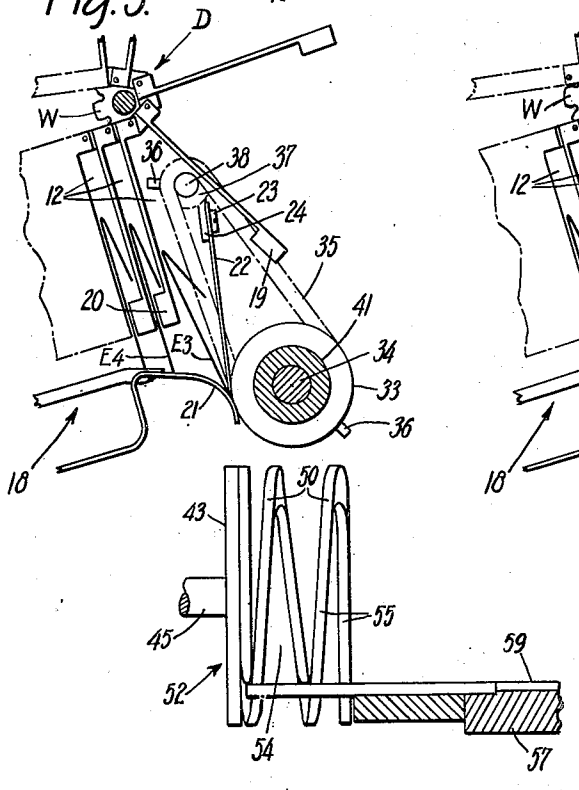
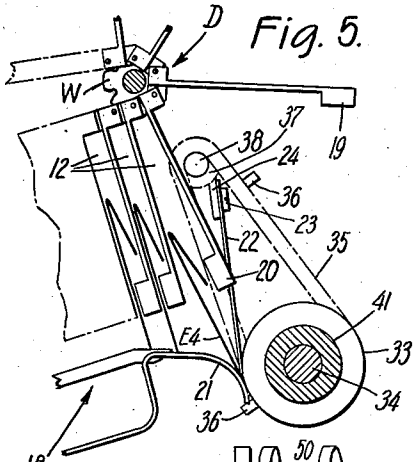
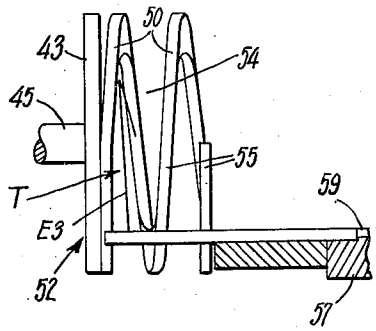


Fig. 5.





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Patented Feb. 25, 1941

2,232,720

UNITED STATES PATENT OFFICE

2,232,720

DELIVERY MECHANISM

Abraham Novick, Flushing, N. Y., assignor to F. L. Smithe Machine Co., Inc., New York, N. Y., a corporation of New York

Application February 19, 1937. Serial No. 126,535
Renewed June 6, 1939

14 Claims. (Cl. 93—75)

This invention relates to a delivery mechanism for planiform articles, such as envelopes having a resilient fold therein, and more particularly relates to an improved means for receiving such envelopes as they are discharged seriatim from compartments of a drying conveyor of known articulated type, the general object of the invention being to provide for positive feeding of the envelopes as they emerge from the articulated drier conveyor, and for their proper transfer to a second conveyor.

Another object of the invention is to provide an improved means for effecting the above-mentioned transfer of the articles from the articulated conveyor for assembly in horizontal relation, this transfer device taking the form of a pair of complemental helical devices adapted to cooperate upon the articles at opposite sides thereof for the purpose of regulating and controlling their relative position by maintaining the individualized relationship of the envelopes while advancing them progressively and delivering them to the horizontal assembly formation under suitable pressure; such helical devices having been disclosed in my co-pending application, Serial #20,575. The present invention, as to this feature, includes as an object, the provision of means by which a downward feed of the articles to the helical devices is effected accurately and reliably, and any tendency of the articles toward aberration from the spiral devices is overcome.

Other objects and features of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses.

In the accompanying drawings, like characters of reference have been applied to corresponding parts throughout the several views making up the drawings, in which:

Fig. 1 is a view in longitudinal sectional elevation, of a somewhat schematic character, but illustrating with sufficient detail a delivery mechanism in the construction of which the present invention has been embodied, the section being taken on line 1—1 of Fig. 2;

Fig. 2 is a view of said delivery mechanism taken in vertical section on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary detail view from the same viewpoint as Fig. 1, showing the operating parts of the transfer mechanism in a different position;

Fig. 4 shows the same parts in a still more advanced position;

Fig. 5 shows the same parts at the beginning of a delivery operation, immediately after release of an article to be transferred.

In a now-preferred embodiment of the invention selected for illustration and description, the reference character 11 designates generally part of the frame of a machine for folding the sealing flaps of envelopes into a position suitable for exposure to a drying treatment when fed from the folding mechanism to the compartments 12 of an articulated conveyor D of known type, as for example by a discharge rotor 13 designed to operate in accordance with the invention disclosed and claimed in my co-pending application for U. S. Letters Patent Serial No. 93,322.

This is merely an illustrative source, as envelopes derived from any suitable source may be dealt with by the novel delivery mechanism of the present disclosure.

Each envelope, as E, of the series E, E', E'', etc., is fed, in its turn, from the source 13 to an appropriate compartment, 12, constituted by two adjacent partitions, as 16, 17 etc., of the aforesaid articulated conveyor D, which is mounted upon sprocket wheels W, etc., only the receiving and delivery stages of the conveyor being shown in the drawings, since the intermediate portion of the articulated conveyor operates in a suitable drier mechanism indicated in general by the reference character 18, but not illustrated in detail, as its structure may be of conventional, or other suitable, construction, and is not claimed herein as an independent invention.

At the discharge stage of the articulated conveyor below the sprocket wheel W in Fig. 1, each envelope, as E3, (see Fig. 3), drops away from its compartment 12 when the leading partition, as 19, swings outward and upward around the sprocket wheel W', opening up the compartment 12 between partitions 19 and 20, so that the envelope E3, is free to escape into a V-shaped guiding means, one side of which is constituted by stationary, preferably convex, guide members or walls 21, while the other side is constituted in part by a pair of guide fingers 22, each secured as by a set screw 23 upon an angle plate 24 which in turn is fixed by a set screw 25 in adjusted position on a shaft 26 extending from a bracket 27 bolted, as at 28, to the frame parts 29, respectively.

Between the fingers 22, is another, cam-shaped finger 30, secured by a set-screw 31 on an arm 32 and this finger acts on the leading end of the envelope and its adjoining flap, to assist in flattening them together so that the divergent flap

will not interfere with forward movement of the envelope.

Abutment rolls 33 on a shaft 34 hold the fingers 22 in proper position to perform the guiding function, as the envelope is advanced positively into the bite of the guide wall 21 and guide fingers 22.

In pursuance of the invention, this feeding is accomplished positively by a pair of laterally spaced chains 35 provided with pins 36 sufficiently long to engage the upper edges of the envelope E3 when the latter has assumed the position shown in Fig. 4, from which position the pins move the envelope positively downward past the Fig. 1 position, and finally into the space 54, Fig. 5.

Each of the chains 35 runs from a sprocket wheel 37 on one of a pair of shafts 38, (see Fig. 2), to a driving sprocket wheel 39 on the shaft 34, the latter being mounted non-rotatively in the frame parts 6 and 7.

The bracket arms 27 can be adjusted to take up slack in the chains 35 respectively, and held in adjusted position by the bolts 28, which pass through slotted segments 40 (see Fig. 1), provided for that purpose.

The sprockets 39 may desirably be formed integrally with the rotor structure 41 which includes also the rolls 33 and the rolls may desirably be of suitable diameter to cause their peripheries to aid in discharging the envelopes from the bite of the guides.

In pursuance of the invention, chains 35 and/or the rolls 33 force each envelope down to a station designated generally by the reference character T, Fig. 5, where the direction of their feed is to be changed from the edgewise movement already described to a movement perpendicular to their faces, for the purpose of assembling them in horizontal relation as indicated at S in Fig. 1.

For this transfer step, the invention provides a pair of complemental helical feeding devices 51 and 52, each mounted upon a disc or collar, 42 and 43 resepctively, one being fixed upon a shaft 44, and the other upon a shaft 45, these shafts being disposed along parallel axes, and so intergeared, as by helical gears 46, 47, 48, and a shaft 49, etc., that they will rotate in opposite directions.

Their convolutions 50 are so spaced, as at 54, that each is disposed in position to receive a bottom edge of the envelope, as E3, which at any given period is being discharged thereinto and the successive convolutions, as 55, are progressively of smaller pitch, so that as the successive envelopes, are advanced toward the pack, they are caused to approach the preceding envelopes more nearly, in order to force gradually against the rear end of the pack that envelope which is about to constitute the last of the series.

Thus, the speed of travel in pack formation is somewhat lower than that of the intial travel in the new direction, this travel being effected by the pushing action exerted against the rear of the stack; and smoothness of travel is promoted by providing a table 57 along which the stack travels.

Provision is made of means adapted to exert an intermittent jogging action in a forward direction at the base of the pack being formed on the tables, a pair of belts 59 serving this purpose, and deriving their intermittent movement from a suitable cyclically variable mechanism not shown.

A guard or hold-down device, as 60, may be provided, to prevent upward displacement or rebound of the envelopes unduly, this device being constituted in the instance illustrated, by a finger secured adjustably, as by a binding screw 61 to the finger 30 already described.

The guide plate 21, (see Fig. 1), may be suitably adjustable, as for example by means of a slot not shown through which extends the bolt 62, carried upon the frame part 65.

The bolt 62 may also serve as shown, to support the forward end of the guide-bar 64.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In a machine of the class described, in combination, an articulated conveyor of the type including an endless link chain having upper and lower stretches, each link carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along said conveyor and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded, moist gummed sealing flap to be dried; a delivery mechanism comprising a pair of spaced-apart rotatable helical members disposed completely below the articulated conveyor and adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of the lower stretch of the articulated conveyor; and an endless transfer conveyor for intercepting the blanks at the delivery end of the articulated conveyor and thrusting them downward, edgewise, to the delivery mechanism.

2. In a machine of the class described, in combination, an articulated conveyor of the type including an endless link chain having upper and lower stretches, each link carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along said conveyor and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded, moist gummed sealing flap to be dried; an article support extending adjacent, and parallel to, the lower stretch of the articulated conveyor and falling away from said conveyor stretch toward the delivery end thereof; a delivery mechanism comprising a pair of spaced-apart rotatable helical members disposed completely below the articulated conveyor and adapted to receive, in the spaces between convolutions of each helix, opposite edges of an envelope delivered thereto from one of said compartments at the end of the lower stretch of the articulated conveyor; and means to rotate said helices to advance each article in turn in a direction parallel to the axes of the helices, against the rear of a pack of said articles so assembled; and an endless transfer conveyor for intercepting the blanks at the deliver end of the articulated conveyor and thrusting them downward, edgewise, to the delivery mechanism.

3. In a machine of the class described, in combination, an articulated conveyor of the type including an endless link chain having upper and lower stretches, each link carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along said conveyor, and each com-

partment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded, moist gummed sealing flap to be dried; an article support extending adjacent, and parallel to, the lower stretch of the articulated conveyor and falling away from said conveyor stretch toward the delivery end thereof; a delivery mechanism comprising a pair of spaced-apart rotatable helical members disposed completely below the articulated conveyor and adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of the lower stretch of the articulated conveyor; a table extending in a direction parallel with the axes of said helices; means to rotate said helices to advance said envelopes successively along said table into stack formation; and an endless transfer conveyor for intercepting the blanks at the delivery end of the articulated conveyor and thrusting them downward, edgewise, to the delivery mechanism.

4. In a machine of the class described, in combination, an articulated conveyor of the type including an endless link chain having upper and lower stretches, each link carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along a run, and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded, moist gummed sealing flap to be dried; an article support extending adjacent, and parallel to, the lower stretch of the articulated conveyor and falling away from said conveyor stretch toward the delivery end thereof; a delivery mechanism comprising a pair of spaced-apart rotatable helical members disposed completely below the articulated conveyor and adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of the lower stretch of the articulated conveyor; a table extending in a direction parallel with the axes of said helices, means to rotate said helices to advance said articles along said table and to form a pack on the table beyond the ends of the helices; and an endless transfer conveyor for intercepting the blanks at the delivery end of the articulated conveyor and thrusting them downward, edgewise, to the delivery mechanism.

5. In a machine of the class described, a delivery mechanism as claimed in claim 2 in which the article support associated with the articulated conveyor is curved downward at the extremity of its delivery end to extend substantially tangent to the endless transfer conveyor.

6. In a machine of the class described, in combination, an articulated conveyor of the type including a chain with links each carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along a run of said conveyor, and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded sealing flap; a transfer mechanism comprising a pair of spaced-apart rotatable helical members adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of said run of the articulated conveyor; and a transfer means intermediate the delivery end of said articulated conveyor and the receiving end of said helices, said transfer means including a rotor and a guide plate adapted to receive there between each article as it is delivered by gravity from the latter end of said articulated conveyor; and means acting to bias said articles successively and positively into the bite of said rotor.

7. In a machine of the class described, in combination, an articulated conveyor of the type including a chain with links each carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along a run of said conveyor, and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded sealing flap; a transfer mechanism comprising a pair of spaced-apart rotatable helical members adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of said run of the articulated conveyor; and a transfer means intermediate the delivery end of said articulated conveyor and the receiving end of said helices, said transfer means including a rotor and a guide plate adapted to receive there between each article as it is delivered by gravity from the latter end of said articulated conveyor; and means acting to bias said articles successively and positively into the bite of said rotor, said biasing means comprising a pair of chains spaced apart transversely of the direction of transfer, and having studs to follow in engagement the rear edge of said envelope and align it properly within said bite.

8. A transfer means as claimed in claim 7 in which said rotor includes, in an integral, unitary structure, a pair of spaced-apart circumferential pressure-roll surfaces, and a pair of spaced-apart sprocket pinions or wheels to actuate said chains.

9. In a machine of the class described, in combination, an articulated conveyor of the type including a chain with links each carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along a run of said conveyor, and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded sealing flap; transfer mechanism comprising a pair of spaced-apart rotatable helical members adapted to receive in the spaces between convolutions of each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of said run of the articulated conveyor; and a transfer means intermediate the delivery end of said articulated conveyor and the receiving end of said helices, said transfer means including a curved guide-plate, and a rotor adapted to operate upon said articles in juxtaposition with said guide-plate, to feed the article away from said delivery end of the conveyor to a pair of helical members for assembly.

10. In a machine of the class described, in combination, an articulated conveyor of the type including a chain with links each carrying a partition adapted to form with an adjacent partition a compartment in a series of such compartments extending along a run of said conveyor, and each compartment being adapted to confine loosely a planiform article with a resilient fold, such as an envelope with a partially folded sealing flap; transfer mechanism comprising a pair of spaced-apart rotatable helical members adapted to receive in the spaces between convolutions of

each helix opposite edges of an envelope delivered thereto from one of said compartments at the end of said run of the articulated conveyor; and a transfer means intermediate the delivery end of said articulated conveyor and the receiving end of said helices, said transfer means including a curved guide-plate, a rotor adapted to operate upon said articles in juxtaposition with said guide-plate, to feed the article away from said delivery end of the conveyor to a pair of helical members for assembly, and a finger adapted to cooperate with said plate in flattening together said fold and its adjoined end of said article, preliminary to introduction thereof to the bite of said rotor and plate.

11. In a machine of the class including an endless articulated conveyor of the type constituted by links with compartment forming partitions adapted to confine an envelope with a partly folded sealing flap, and to separate to permit ejection of said envelope at the delivery stage of the lower run of said conveyor, and a positively acting means to promote downward, edgewise transfer of the article from the path of said partitions, consisting of an endless chain device with studs adapted to move in an orbit intersecting the path of said articles each upon ejection from one of said compartments.

12. In an envelope making machine, in combination, an articulated conveyor of the compartment type including an endless link chain having upper and lower straight stretches and compartment partitions carried individually by the respective chain links, and end sprockets for the conveyor, each compartment being bounded by two successive compartment partitions, one at the leading side and the other at the trailing side of the compartment, said partitions traveling in parallel relation in the straight stretches but being deflected into divergent relation when passing around the end sprockets, an envelope stacking table disposed below the conveyor adjacent the delivery end of the lower stretch of the conveyor, envelope shifting means for engaging an envelope in the compartment which is bounded at its leading side by a deflected partition and at its trailing side by the first undeflected partition of the lower stretch of the conveyor, and for positively moving such envelope edgewise in a downward direction toward the stacking table and clear of the last mentioned partition before substantial deflection of such partition.

13. In an envelope making machine, in combination, an articulated conveyor of the compartment type including an endless link chain having upper and lower straight stretches and compartment partitions carried individually by the respective chain links, and end sprockets for the conveyor, each compartment being bonded by two successive compartment partitions, one at the leading side and the other at the trailing side of the compartment, said partitions traveling in parallel relation in the straight stretches but being deflected into divergent relation when passing around the end sprockets, an envelope stacking table disposed below the conveyor adjacent the delivery end of the lower stretch of the conveyor, envelope shifting means for engaging an envelope in the compartment which is bounded at its leading side by a deflected partition and at its trailing side by the first undeflected partition of the lower stretch of the conveyor, and for positively moving such envelope edgewise in a downward direction toward the stacking table and clear of the last mentioned partition before substantial deflection of such partition, and means cooperative with the stacking table for taking over control of the envelope from the envelope shifting means and adding it to the stack on the table.

14. In an envelope making machine, in combination, an articulated conveyor of the compartment type including an endless link chain having upper and lower straight stretches and compartment partitions carried individually by the respective chain links, and end sprockets for the conveyor, each compartment being bounded by two successive compartment partitions, one at the leading side and the other at the trailing side of the compartment, said partitions traveling in parallel relation in the straight stretches but being deflected into divergent relation when passing around the end sprockets, an envelope stacking table disposed adjacent the delivery end of the lower stretch of the conveyor, envelope shifting means for engaging an envelope in the compartment which is bounded at its leading side by a deflected partition and at its trailing side by the first undeflected partition of the lower stretch of the conveyor, and for positively moving such envelope edgewise toward the stacking position in a direction substantially at right angles to the travel of the oncoming, undeflected partition and clear of such partition before substantial deflection thereof.

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