Dec. 12, 1961 A. NOVICK 3,012,774

ENVELOPE MAKING MACHINERY

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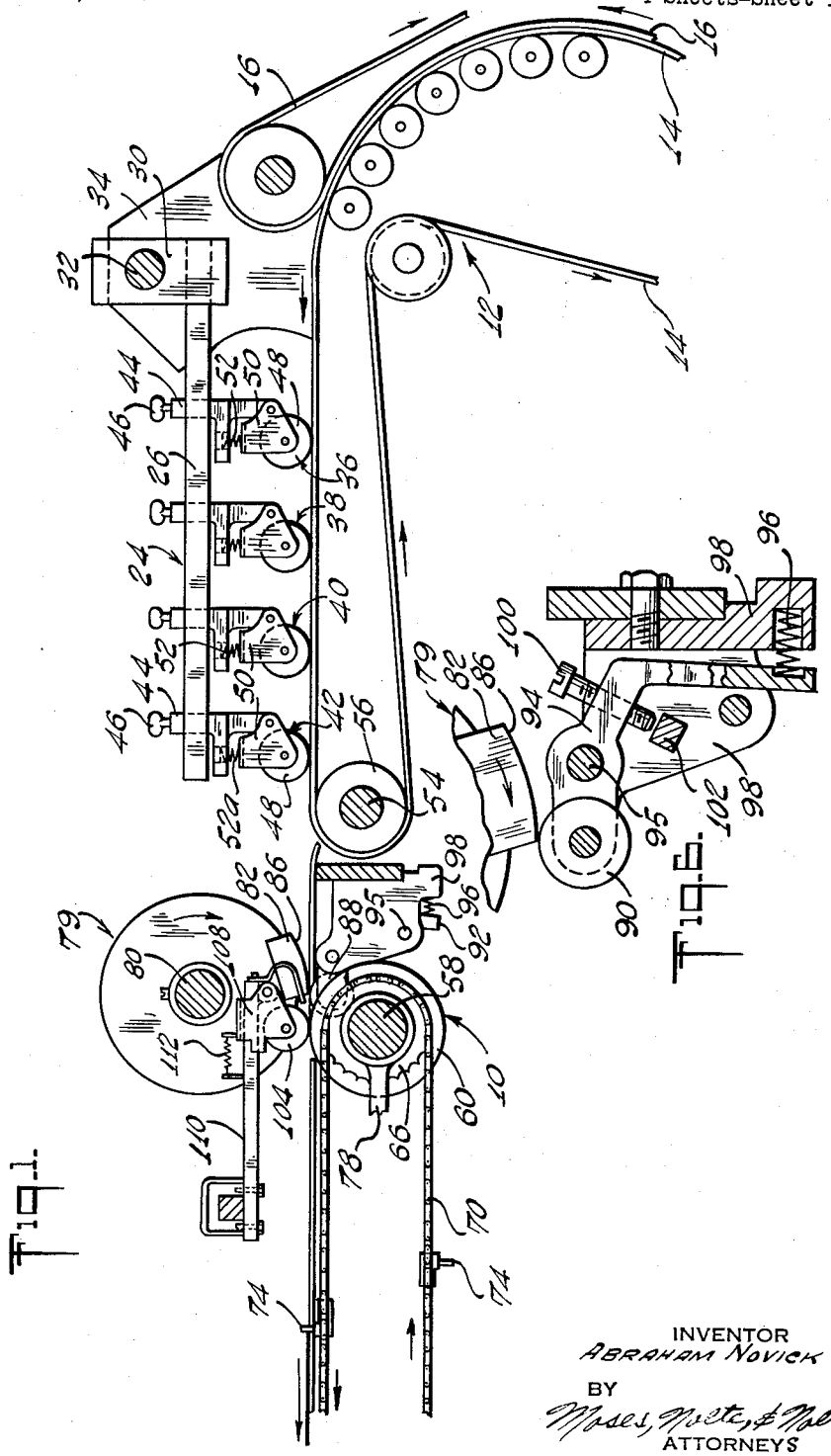


Fig. 1.

Fig. 5.

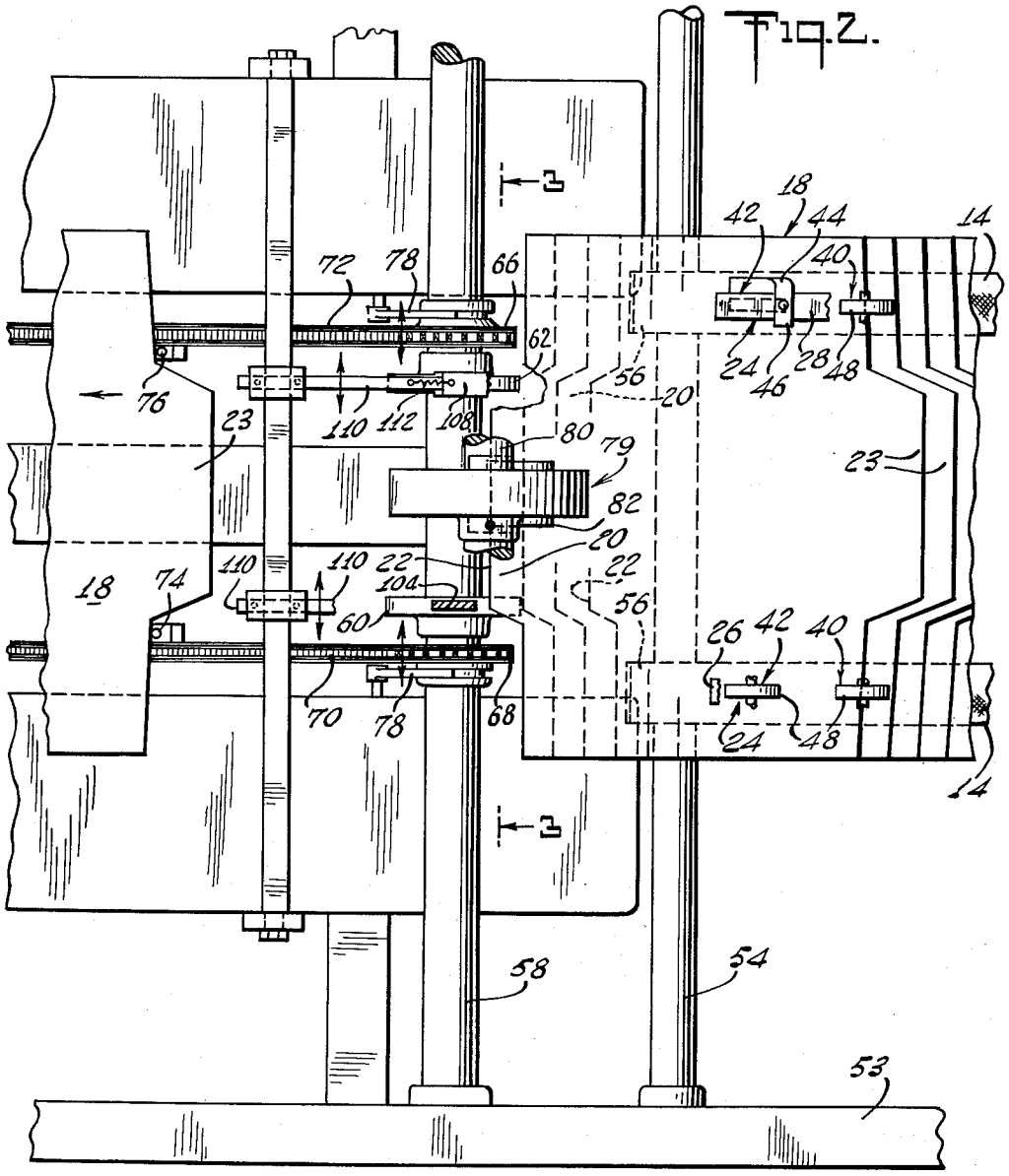
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Fig. 2.



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Fig. 3.

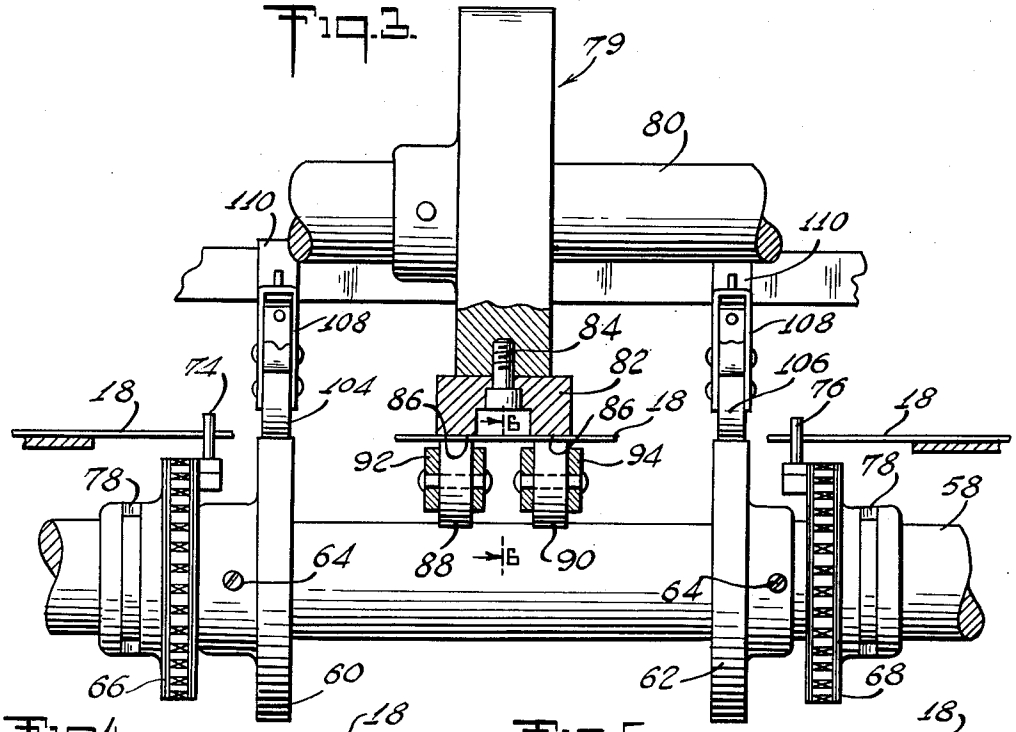


Fig. 4.

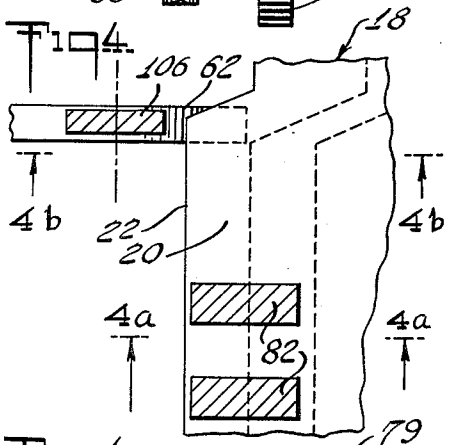


Fig. 5.

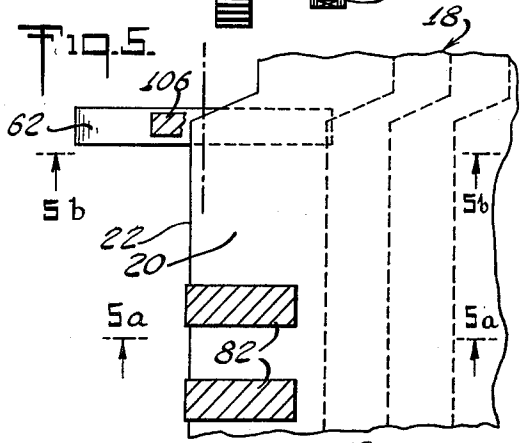


Fig. 4a.

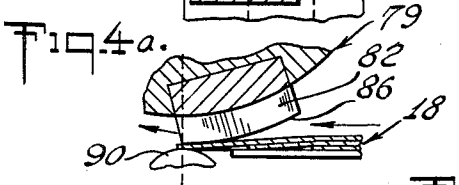


Fig. 5a

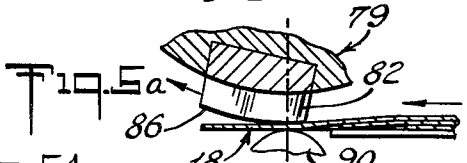
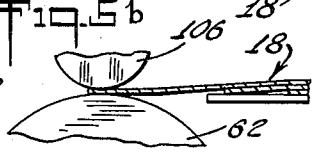


Fig. 4b



Fig. 5b



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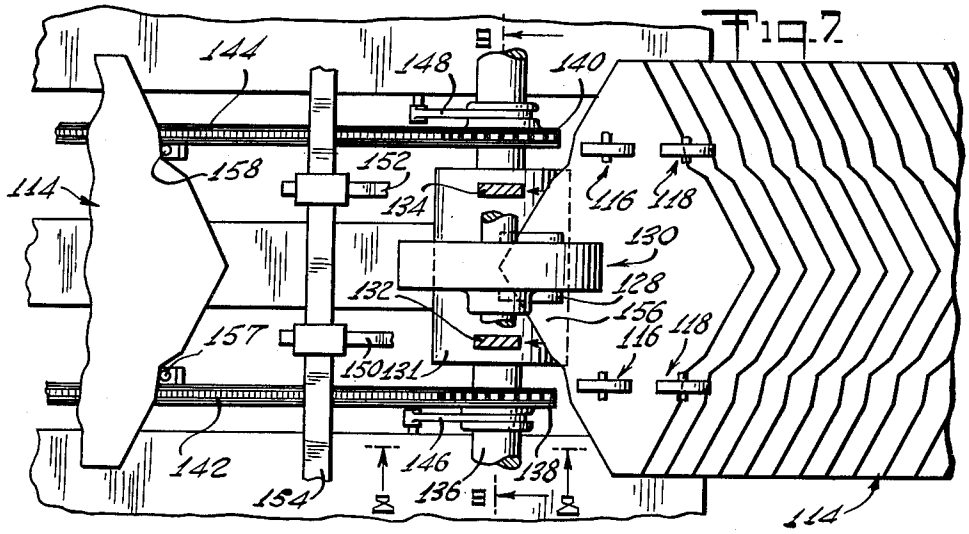


FIG. 7

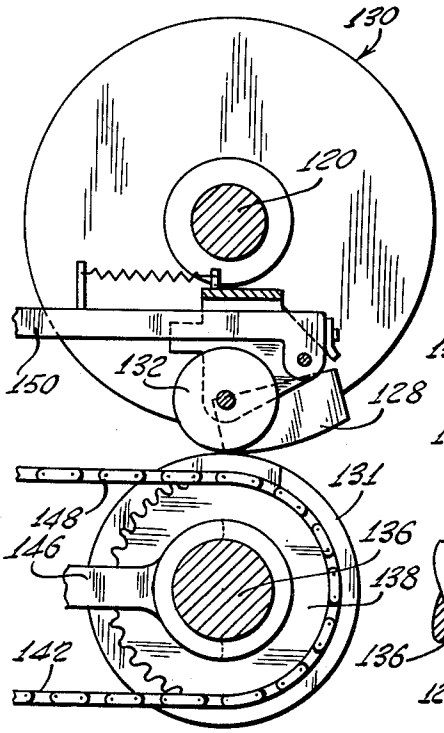


FIG. 8

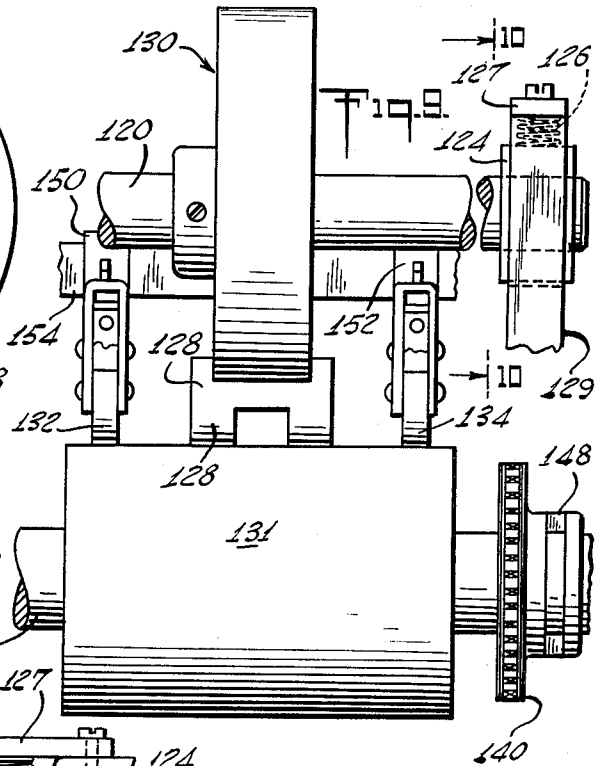


FIG. 9

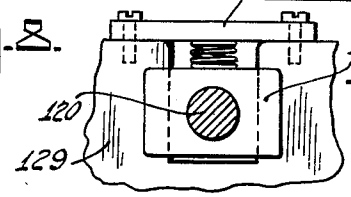


FIG. 10

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United States Patent Office 3,012,774 Patented Dec. 12, 1961

3,012,774

ENVELOPE MAKING MACHINERY

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Filed Dec. 4, 1958, Ser. No. 778,225
26 Claims. (Cl. 271—37)

This invention relates in general to blank separating apparatus such as is employed in envelope making machines and particularly to a new and useful apparatus for separating blanks advanced in fanned-out overlapping relationship and for feeding such blanks in individualized spaced and timed relationship.

The present invention represents an advance over the prior art constructions, particularly in the arrangement which permits the rapid feeding of a multiplicity of fanned-out blanks and the withdrawal of each blank in succession by a pullout mechanism which includes means for first initiating the rapid withdrawal of the first envelope of the fanned-out group and partially separating it from the remainder, as the latter are being continuously advanced toward the pullout mechanism. The mechanism for initiating withdrawal of each blank in succession cooperates with a roller feed mechanism, which seizes the partially separated blank and continues the rapid withdrawal thereof until it is completely separated from the fanned-out group.

The apparatus of the present invention includes a rapidly rotating segment of relatively short peripheral extent which is timed to operate in conjunction with the speed of advance of the fanned-out blanks to engage the foremost blank at a point slightly to the rear of the forward edge thereof. As the blank is engaged a pressure retaining roller is rolled off the rear edge thereof to aid in effecting rapid instantaneous separation and advance of the topmost blank from the remaining group. The blank is fed by the said segment a short distance to a position where a forward edge thereof is brought into engagement with the mechanism for completing the withdrawal of the blank. The latter mechanism carries the blank to a position for operating thereon by precise timing and aligning mechanism for further feeding. The apparatus is both simple to operate and maintain and includes an arrangement to adjust the mechanism for blanks of the various widths.

In accordance with one embodiment of the invention there is provided means for rapidly pulling out envelope blanks having front flaps with substantially straight forward edges from a group of such blanks which are continuously advanced in fanned-out relationship.

In accordance with another embodiment of the invention there is provided means for pulling out envelopes of substantially rhomboid shape from a group of such envelopes fed in fanned-out relationship.

Accordingly, it is an object of this invention to provide a blank pullout and advancing mechanism for individualizing blanks fed in overlapping relationship.

A further object of the invention is to provide a mechanism for individualizing envelope blanks from a stack of such blanks fed in fanned-out relationship including a rapidly rotating segment which is adapted to operate in timed relationship to the feed of advance of the fanned-out blanks to withdraw the uppermost blank from the group and initiate its rapid movement away from the remaining portion of the group into association with mechanism for completing the withdrawal of and further feeding the individualized blank.

A further object of the invention is to provide a device for separating individual blanks from a plurality of overlapped blanks for any configuration.

A further object of the invention is to provide a blank

individualizing mechanism which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described preferred embodiments of the invention.

In the drawings:

FIG. 1 is a fragmentary elevation partly in section of a portion of an envelope machine indicating a blank individualizing mechanism constructed in accordance with the invention and arranged to individualize blanks fed thereto in overlapping relationship;

FIG. 2 is a fragmentary top plan of portions of the mechanism indicated in FIG. 1;

FIG. 3 is a vertical section taken on the line 3—3 of FIG. 2;

FIG. 4 is a somewhat schematic top plan indicating the initial position of the blanks as the separating segment contacts the forward edge of the topmost blank;

FIG. 4*a* is a fragmentary vertical section taken on the line 4*a*—4*a* of FIG. 4;

FIG. 4*b* is a fragmentary vertical section taken on the line 4*b*—4*b* of FIG. 4;

FIG. 5 is a top plan similar to FIG. 4 but indicating the segment in an advanced position of travel with the uppermost blank pulled away from the remaining blanks an initial distance;

FIG. 5*a* is a fragmentary vertical section taken on the line 5*a*—5*a* of FIG. 5;

FIG. 5*b* is a fragmentary vertical section taken on the line 5*b*—5*b* of FIG. 5;

FIG. 6 is a fragmentary vertical section taken on the line 6—6 of FIG. 3;

FIG. 7 is a fragmentary top plan of another embodiment of blank pullout mechanism for blanks which do not have a straight forward edge, such as rhomboid blanks;

FIG. 8 is a fragmentary vertical section taken on the line 8—8 of FIG. 7;

FIG. 9 is a fragmentary vertical section taken on the line 9—9 of FIG. 7; and

FIG. 10 is a fragmentary vertical section taken on the line 10—10 of FIG. 9.

Referring to the drawings in particular, the invention as embodied therein includes portions of an envelope making machine generally designated 10 indicating a belt conveyor mechanism generally designated 12 including spaced pairs of lower endless belts 14 and spaced pairs of cooperating endless belts 16 (only one of each of which is shown in FIG. 1). The belts 14 and 16 cooperate to advance a series of envelope blanks generally designated 18 which are arranged in overlapping fanned-out relationship. The envelopes are fed from a drying mechanism (not shown) upwardly around an arc to a horizontal feed line for operation thereon by pullout mechanism constructed in accordance with the invention. The pullout mechanism is effective to rapidly separate each blank as it is fed from the remaining blanks in the series of fanned-out blanks, and thereafter feed it into association with mechanism for properly aligning and spacing the blanks for further operation thereon by mechanism (not shown) to complete the formation of the blanks into an envelope.

In the embodiments illustrated in FIGS. 1 to 6, inclusive, the pullout mechanism constructed in accordance with the invention is adapted for pulling out blanks which are substantially rectangular and include a front flap 20 which has a substantially straight forward edge 22. In this embodiment the blanks are arranged in an overlapping

relationship at which the forward edge 22 of each succeeding blank is spaced rearwardly of each next overlying blank a distance of approximately 1⅜". It should be appreciated that the pullout mechanism includes a device for operating on this marginal edge to separate the topmost blank from the remaining blanks in the fanned-out series. It is, of course, within the invention to operate on blanks which are arranged with their forward edges overlapped a greater or lesser amount than 1⅜" by making simple adjustments in the size and speed of rotation of the pullout mechanism.

Each blank 18 is also provided in the present instance with a trailing flap 24 which is slightly larger than the leading flap 20.

The series of fanned-out blanks are advanced by the conveyor mechanism 12 beneath a blank holding device generally designated 24 (FIGS. 1 and 2). The holding device 24 includes arms 26 and 28 which are mounted on associated arms 30, each of which is rotatable on a shaft 32 fixed to a frame member 34. The arms are adjustable along the shaft 32 and one of each of the arms 26 and 28 is arranged to overlie the marginal edges of the flaps being advanced therebeneath. Each of the arms 26 and 28 is provided with a plurality of roller holding devices, in this instance four, arranged in spaced location along the direction of feed of the blanks and generally designated 36, 38, 40 and 42. Each of the roller holding devices includes a bracket portion 44 which is slid over the associated arm 26 or 28 and which is tightened thereon in a selected position by a set screw 46. Each roller holding device is provided with a roller 48 which is pivotally mounted on the end of a link piece 50 which is biased by means of a compression spring 52 downwardly against the surface of the blanks being advanced therebeneath. In accordance with the invention, the roller holding device 42 is provided with a compression spring 52*a* of substantially less compressive force than the remaining compression springs 52 to provide only slight holding pressure on the uppermost blank after the others have rolled off this blank.

The envelope machine 10 includes side frames 53, one of which is indicated in FIG. 2, in which is rotatably mounted a shaft 54 on which a pulley 56 of the conveyor mechanism 12 is affixed. Also journalled in the end frames 53 is a shaft 58 which carries two hubbed backing rollers 60 and 62 (FIG. 3) which are adjustably positioned on the shaft 58 to align with the side edges of the forward flap 20 which is being fed by the conveyor 12. The rollers 60 and 62 are clamped in position on the shaft 58 as by set screws 64 for rotation with the shaft. Slidably positioned on the shaft 58 for rotation independently thereof are a pair of sprockets 66 and 68 arranged outboard of each of the backing rollers 60 and 62. The sprockets 66 and 68 are driven from chains 70 and 72 which are driven from mechanism (not shown) located at the end of the machine toward the direction of blank feed. The chains 70 and 72 converge slightly in the direction of feed in order to permit pairs of timing pins 74 and 76, respectively, to move behind blanks which are advanced by the pullout mechanism and gradually center and align the blanks as the pins 74 and 76 move inwardly along the trailing edge toward the sides of the trailing flap 24. The gradual convergence of the timing pins 74 and 76 insures that there will be adequate space between the edge of the trailing flap 24 for the pins to move therebehind on each side thereof. Thus, there is little likelihood that the pins will by-pass a misaligned flap. It should be appreciated that the sprocket wheels 66 and 68 may be shifted laterally on the shaft 58. Each sprocket wheel 66 and 68 is mounted on a yoke mechanism 78 which includes a lever control for shifting these sprockets.

In accordance with the invention means are provided to rapidly pull out the foremost blank from the remaining series of blanks being slowly fed in fanned-out relationship. This mechanism includes a segment roller generally designated 79 which is affixed to a shaft 80 which is rotatably mounted in end frame members (not shown). The segment roller 79 includes a U-shaped pullout segment 82 which is bolted thereto by means of a bolt 84. The segment 82 includes a curved outer surface 86 of a precise circumferential dimension to effect pullout of only one envelope blank from the blanks being fed in fanned-out relationship at a predetermined speed of rotation thereof.

The pullout segment 82 cooperates with a pair of spaced rollers 88 and 90 (FIG. 3) which are located on the end of an arm of associated yoke crank arm members 94 and 92, respectively. The yoke crank arm members 92 and 94 are pivoted at the central portion as at 95 and are biased in a clockwise direction as viewed in FIG. 6 by a compression spring 96. The spring 96 is retained within a socket of a frame member 98. The arm 94 is provided with a stud stop 100 which contacts a stationary stop 102 affixed to the frame member 98 and limits the upward movement of the rollers 88 and 90 when the segment 82 is not in contact therewith.

Rotation of the roller 79 with its segment 82 is designed to initiate the removal of the uppermost blank from the blanks being fed in fanned-out relationship by the conveyor 12 and advance it a short distance into the bight of feeding rollers 60 and 62 which cooperate with laterally adjustable rollers 104 and 106, respectively (FIG. 3). The rollers 104 and 106 are mounted on a plate member 108 which is pivotally connected to the end of an adjustable frame arm 110. The plate 108 is biased by a tension spring 112 affixed to the arm 110 to urge the rollers 104 and 106 into engagement with the rollers 60 and 62, respectively.

The timing and precise feeding of the blanks by the pullout mechanism is indicated schematically in FIGS. 4, 4*a* and 4*b* and 5, 5*a* and 5*b*. The segment 82 first contacts the forward edge of the flap 20 to the rear of the forward edge 22 and rapidly moves it ahead of the slowly fed blanks being advanced by the conveyor 12. The segment never compresses the forward edges of the subjacent blanks but merely contacts the forward margin of the flap 12 with the aid of the backing rollers 88 and 90. It can be seen that small adjustment of the size of the segment 82 or its speed of rotation would be required to accommodate blanks fed in different overlapping relationships. The present mechanism effects a rapid pullout of very closely spaced overlapped blanks. In FIGS. 4, 4*a* and 4*b* it should be noted that the cooperating rollers 60 and 104 of the advance feed mechanism has not as yet contacted the forward edge of the flap 20. As the segment 82 continues its rotation as indicated in FIGS. 5, 5*a* and 5*b*, the blank is rapidly accelerated out from the remaining series of blanks and fed into association with the forward feeding mechanism between the rollers 60 and 104 and 62 and 106 for further feeding to the aligning pins 74 and 76 of the chains 70 and 72, respectively.

In order to insure that the segment 82 pulls out only the uppermost blank and leaves the remaining blanks intact, it is essential to precisely adjust the roller holding devices 36, 38, 40 and 42 in their blank holding positions above the conveyor 12. The last holding device 42 to bear upon the flap which is being pulled out is provided with a very light compression spring 52*a* which urges the rollers downwardly against the blank with only a small amount of force necessary to keep it from lifting off the feed line. The arrangement is such that the segment 82 will contact the forward edge as shown in FIG. 4 precisely at the time or shortly after the time that the roller 48 of the first of the higher compression spring holding devices 40 starts to roll off the trailing edge of the blank 18.

Since the roller 48 of the holding device 42 is biased into contact with the blanks by a spring 52*a* of lesser force than the remaining devices 36, 38, and 40, the

uppermost sheet is held at the last instant by a slight downward tension, only to prevent it from being lifted off the horizontal feeding line as the segment **82** is moved into contact with the forward edge of this uppermost blank. The positioning of the roller **40** is such that it rolls off the trailing edge of the blank **18** precisely at the instant, or shortly before the instant that the segment **82** contacts the forward edge and begins pulling it from the remaining series of blanks. Thus, the heavy tension rollers **40**, **38** and **36** remain on the blanks until they are moved into a position at which the segment becomes operative to rapidly accelerate the blank and pull it away from the remaining blanks, at which time the roller **48** of the holding device **40** rolls off the trailing edge blank **18**.

After the blank is rapidly pulled out by the cooperation of segment **82** and rollers **60** and **104** and **62** and **106**, it is positioned on the chains **70** and **72** whereupon a pair of timing pins **74** and **76** move behind the blanks and advance them at the new timing and individual spacing. The pins **74** and **76** gradually converge behind the trailing edge of the blank **18** and move adjacent the side edges of the trailing flap **24**.

In FIGS. 7 to 10 there is illustrated an embodiment of the invention particularly adapted for feeding blanks of rhomboid configuration or of a configuration other than those having a straight forward edge. Rhomboid blanks **114** are advanced by conveyor mechanism (not shown) similar to the conveyor mechanism **12** with their edges overlapped a small amount. In this embodiment the blanks are held to the conveyor by a series of holding rollers such as the rollers **36**, **38**, **40** and **42**, including a forward set **116** of light downward resilient force followed by sets **118** of substantially greater downward resilient holding force. In this embodiment a segment shaft **120** is mounted in vertical alignment with a sprocket and backing roller shaft **122**. The segment shaft **120** is rotatably mounted on a block **124** which is biased downwardly by a compression spring **126** held between the block and a bar **127** affixed to a frame member **129**. A segment roller **130** is affixed to the shaft **120** and includes a substantially U-shaped segment **128** which is affixed thereto as by bolts (not shown). The shaft **120** and hence the segment **128** is biased downwardly as it rotates.

In this embodiment a single backing roller **131** is provided for cooperation with the segment **128** as well as with lateral biasing rollers **132** and **134** which are adjustable laterally similarly to the previous embodiment and which are biased into contact with the backing roller **130**. In this instance they are aligned in the feed direction with the axis of the segment roller **130**.

The backing roller **131** is adjustable laterally on a shaft **136** which also holds sprocket wheels **138** and **140** carrying chains **142** and **144**, respectively, of the advance feed conveyor for the blanks. The sprockets **138** are adjustable laterally on the shaft **122** by means of yokes **146** and **148**, respectively, as in the previous embodiment. Similarly, the rollers **132** and **134** are adjustable along bars **150** and **152**, which bars are adjustable on a cross member **154**, similar to the previous embodiment.

It should be realized that in the case of feeding rhomboid blanks or blanks which do not have a straight forward edge, the timing of pull out for the blanks and movement into association with the advance feed conveyor chain is determined by the distance from the foremost point on the blank which is the centerline of a forward flap **156** to a position adjacent the side portions of the forward edge of this flap. The segment **128** operates as in the previous embodiment to contact the forward margin of the uppermost blank without contacting the underlying blanks and rapidly advance each blank out of association with the remaining fanned-out blanks. The segment **128** is designed to move a slight distance in contact with the blank and the cooperating backing roller **131** before the rollers **132** and **134** with the cooperating backing roller **131** advance the blank forward at the new rate of speed to complete the separation thereof from the overlapped blanks. After the blank is pulled out, it is positioned in advance of the pullout mechanism on the sprocket chains **142** and **144** whereupon aligning pins **156** and **158** move into contact with the trailing edge of the blank and engage notched portions at the side of the blank to properly align the blank and space it from the next following blank.

Thus, the invention provides a simple mechanism for rapidly pulling out and separating the foremost blank from a series of blanks fed in overlapping fanned relationship. The mechanism is adjustable to accommodate various sizes of blanks as well as to accommodate blanks which are fanned-out with various degrees of overlap. The invention provides mechanism for separating and feeding blanks at spaced controlled time rates regardless of the size of the blank or its configuration.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A device for separating blanks from a series of blanks being fed continuously in fanned-out formation with the forward margins of successive blanks spaced apart by a predetermined amount, comprising a segment rotatable at a greater peripheral speed than the speed of feed of said blanks and substantially horizontally aligned with the level of feed of said blanks, said segment being rotationally timed to contact the forward margin of the foremost blank only of each blank in succession as it is being fed, backing means operatively associated with said segment to effect rapid advance of the said foremost blank to initiate the separation of said blank from the remaining blanks in said fanned-out formation, and roller feed means in position to engage the said blank after it has been initially advanced from the fanned-out formation by said segment to thereafter feed it to complete the separation of said blank, said roller feed means being substantially horizontally aligned with the level of feed of said blanks.

2. A device for separating blanks in accordance with claim 1 including high speed conveyor means having individual blank, aligning and centering means thereon to receive blanks in succession as they are pulled out from said fanned-out series, said conveyor means being in substantial horizontal alignment with the level of feed of said blanks.

3. A device for separating blanks in accordance with claim 1 wherein said roller feed means is spaced forwardly in the direction of feed from said segment.

4. A device for separating blanks from a series of blanks being fed continuously in overlapped fanned-out relationship with the forward margins of successive blanks spaced apart by a predetermined amount, comprising a segment rotatable at a greater peripheral speed then the speed of feed of said blanks and horizontally aligned with the level of feed of said blanks, said segment being rotationally timed to contact the forward margin of the uppermost blank only of each blank in succession as it is being fed, backing means operatively associated with said segment to effect rapid advance of the uppermost blank and separation of said blank from the remaining blanks being fed, and resilient means in contact with said blanks as they are being fed in overlapping fanned-out relation to hold said blanks in position in said line of feed, said means being spaced from said segment an amount sufficient to cause said blank to move out of contact with said means just prior to the time when the forward margin of said blank is contacted by said segment.

5. A device for separating blanks according to claim 4, wherein said backing means includes a roller biased

upwardly into the path of feed of said blanks and located beneath said segment, and wherein said segment rotates through an arc to contact a blank fed over said roller and cooperates with said roller to rapidly separate and advance the uppermost blank of the series.

6. A device for separating blanks from a series of blanks according to claim 4 wherein said resilient means to hold said blanks in position in said line of feed includes a roller arranged to rotate on the face of said blanks in biased engagement therewith, said roller being adjustable along the line of feed of said overlapping blanks.

7. A device according to claim 4 wherein said resilient means for holding said blanks in position in said line of feed includes a plurality of spaced rollers arranged in the direction of feed of said blanks and in rolling contact with said blanks, said rollers being biased downwardly against the face of said blanks, one of said rollers being spaced from said segment an amount to effect its rolling off of the trailing edges of said blank as said forward edge is contacted by said segment.

8. In an envelope making machine including first conveyor means for continuous feeding of blanks in fanned out overlapping relationship with the uppermost blanks leading the next adjacent lower blank by a predetermined amount, second conveyor means having a faster linear speed than said first conveyor means and means for feeding individual blanks thereon in timed aligned sequence, said second conveyor means arranged adjacent to said first conveyor means to receive blanks therefrom and advance each individually, said second conveyor means being substantially coplanar with the level of said first conveyor means the improvement comprising, a pullout mechanism for rapidly separating each uppermost blank in succession from the b'anks being fed from said first conveyor means and delivering said blank at increased speed into association with said second conveyor means in timed spaced relationship including, a rapidly rotating segment, means cooperating with said segment for biasing the forward edge of said blanks upwardly for engagement by said segment as the latter is rotated, resilient means in engagement with said blanks for holding said blanks on said first conveyor means, including at least a portion of said resilient means which is movable out of contact with said uppermost b'anks to lessen the holding force thereon substantially at the same time as said segment rotates into contact with the forward marginal edge of said uppermost blank, and means to rotate said segment at a speed to effect, together with said cooperating means, contact of the marginal overlapped edge of the uppermost blank without contacting the underlying blanks and to direct said blanks into engagement by said second conveyor means.

9. In an envelope making machine according to claim 8 wherein said resilient means includes rollers biased into contact with the upper faces of said blanks on said first conveyor means and wherein the rollers are arranged and spaced along the line of feed of said blanks whereby they roll off the trailing edge of said blanks as the latter are advanced there beneath.

10. In an envelope making machine according to claim 9 wherein the rollers of said resilient means nearest to said segment are only lightly biased in order to maintain a light contact with the uppermost blank when it is being withdrawn from the remaining group of blanks.

11. In an envelope making machine according to claim 10 wherein all of the rollers but the lightly biased ones are moved out of engagement with the uppermost blank when the latter is in position for engagement by said segment.

12. In an envelope making machine according to claim 8 wherein said cooperating means includes a roller centered beneath said segment and biased upwardly for engagement of a blank by said segment cooperating with said roller.

13. In an envelope making machine according to claim 12 wherein said segment is substantially U-sectioned and including a separate roller biased into engagement with each leg of said U-section.

14. In an envelope making machine according to claim 8 wherein said segment is located to rotate in alignment with the center of envelopes being advanced there beneath, and including at least one cooperating pair of feed rollers laterally spaced from said segment, and means to rotate said rollers to advance blanks delivered thereto by said segment to said second conveyor means, said segment and feed rollers positioned to advanced blanks in substantially coplanar relation with said first and second conveyor means.

15. In an envelope making machine according to claim 14 wherein said pair of feeding rollers are spaced in the direction of feed away from said segment.

16. In a device for transferring blanks being fed continuously by a first conveyor in fanned-out lapped relationship with the forward margins of successive blanks spaced apart by a predetermined amount to a second conveyor for feeding the blanks in non-overlapping timed relationship, the improvement comprising a pullout mechanism arranged between said first and second conveyor means for rapidly separating each uppermost blank in succession from the blanks being fed by said first conveyor and delivering it at increased speed into operative association with said second conveyor, including, a rapidly rotating segment, backing means cooperating with said segment, resilient means in engagement with said blanks on said first conveyor, including a portion which is moveable out of contact with said blanks to lessen the holding force thereon substantially at the same time as said segment rotates into contact with the forward marginal edge of the uppermost blank, said segment rotating at a speed to bring said segment into engagement with the marginal overlapped edge of the uppermost blank without contacting the underlying blanks and to direct said blanks into engagement with said second conveyor, said first and second conveyors and said pull-out mechanism being substantially horizontally aligned with the level of feed of said blanks.

17. A device according to claim 16 wherein said segment is mounted on a shaft, and means for biasing said shaft downwardly toward said backing means.

18. A device according to claim 17 wherein said backing means includes a backing roller shaft, and a backing roller affixed to said shaft arranged to cooperate with said segment.

19. A device according to claim 18 including means to rotate said backing roller shaft at substantially the same speed as said segment and including roller means on each side of said segment cooperating with said backing roller for advancing blanks fed by such segment.

20. A device according to claim 19 wherein said backing roller and said laterally spaced cooperating rollers are arranged in alignment with the axis of rotation of said segment.

21. A method for separating a series of blanks, comprising continuously feeding the blanks at a predetermined speed with the forward margins of successive blanks spaced apart by a predetermined amount, rotating a segment member at a location overlying and substantially coplanar with said blank feed level and arranged to contact the forward margin of each blank as it is being fed to initiate separation of said blank from the remaining blanks while simultaneously holding the trailing edge of the remaining blanks, and after said blank has been initially separated from said fanned-out blanks, completing said separation by moving the blank into association with advance feeding rollers.

22. A device according to claim 4, wherein said resilient means includes a plurality of longitudinally spaced rollers biased downwardly on said series of blanks, the forward one of said rollers being biased downwardly with

a lighter holding force than the others and maintained in contact with said blank as the segment engages said blank.

23. In a device for transferring blanks being fed continuously by a first conveyor in fanned-out lapped relationship with the forward margins of successive blanks spaced apart by a predetermined amount to a second conveyor for continuously feeding the blanks in non-lapped spaced relation at a higher linear velocity than the speed of feed of said blanks on said first conveyor, the improvement comprising a pull-out mechanism having a first and second stage arranged between said first and second conveyors for rapidly separating the foremost blank in succession from the blanks being fed on said first conveyor and accelerating it to an increased speed into operative association with said second conveyor, said first stage including high speed rotating segment means engaging the unlapped marginal area of the foremost blank on said first conveyor to initiate the required acceleration thereof, said second stage including rotating means to engage the leading edge of the blank accelerated by the segment means of said first stage to continue said acceleration, whereby improved high speed transfer of blanks from said first to said second conveyor is accomplished.

24. Apparatus according to claim 23 wherein said first and said second stages of said pull-out mechanism are in substantial vertical alignment on an axis transverse to the longitudinal feed axis of said conveyors.

25. Apparatus according to claim 24 wherein said pull-out mechanism includes singular backing means cooperative with said first stage segment and said second stage rotating means.

26. Apparatus according to claim 23 wherein said first and second stages of said pull-out mechanism are spaced longitudinally along the longitudinal axis defined by said first and second conveyors.

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