Aug. 4, 1936. E. B. BERKOWITZ 2,049,728

MACHINE FOR MAKING OPEN WINDOW ENVELOPES

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Fig. 1.

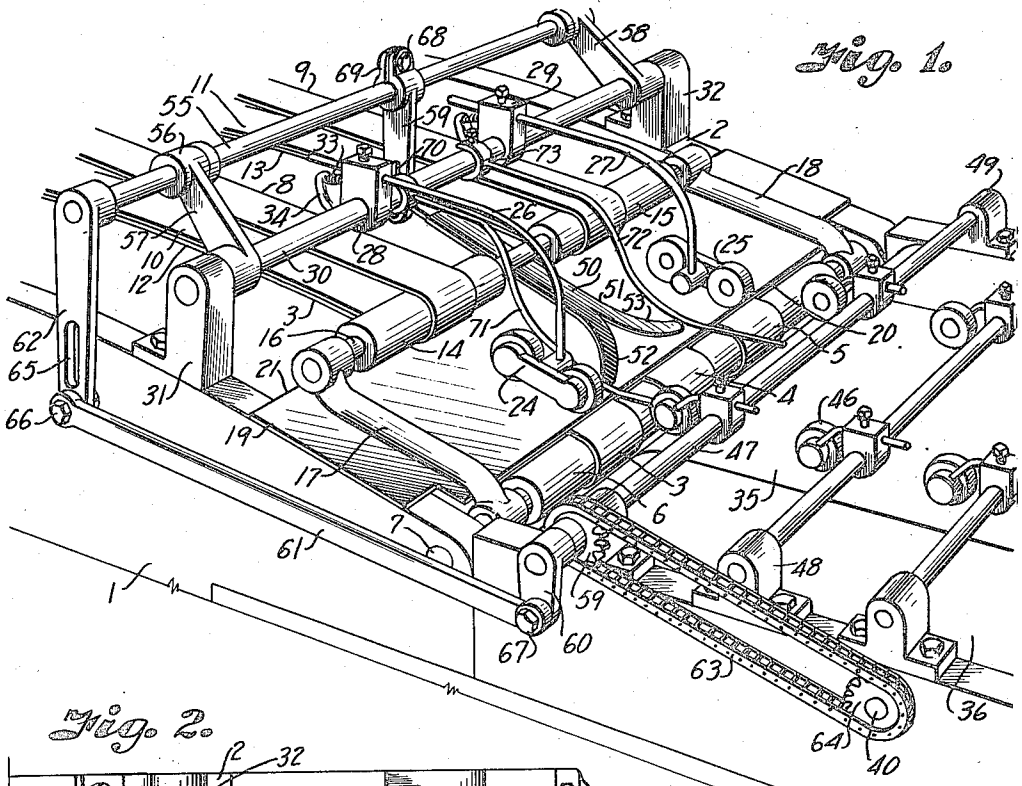
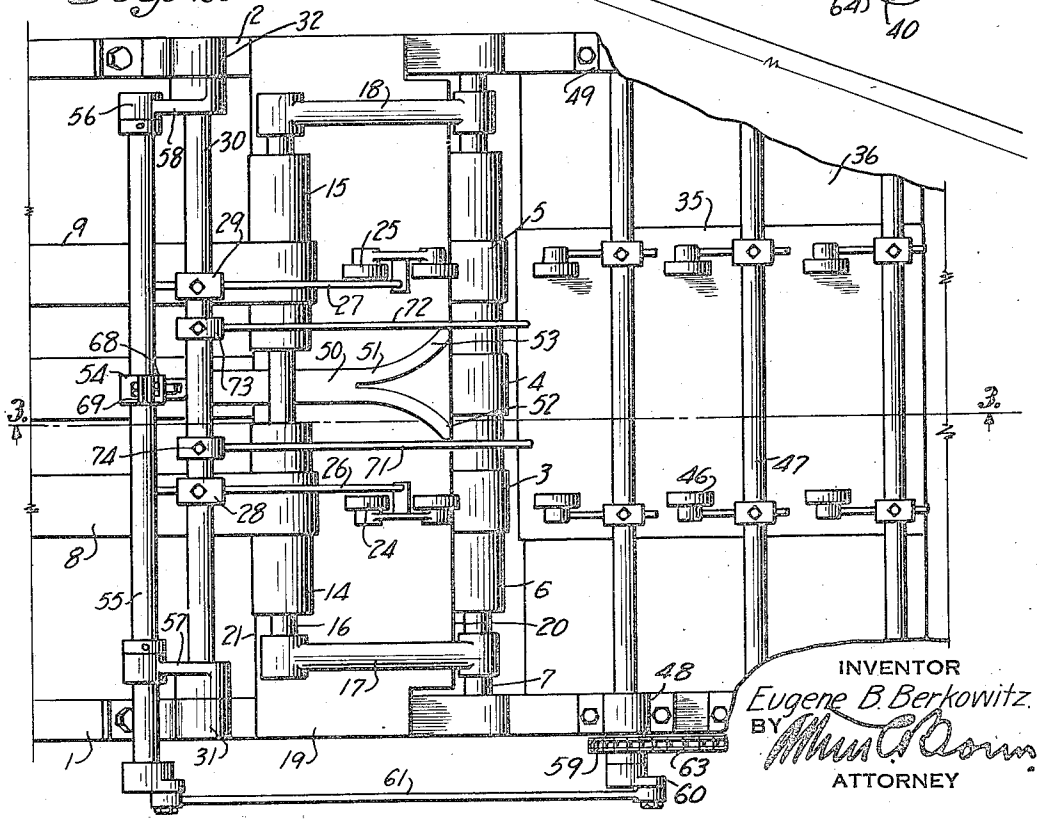


Fig. 2.



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Fig. 3.

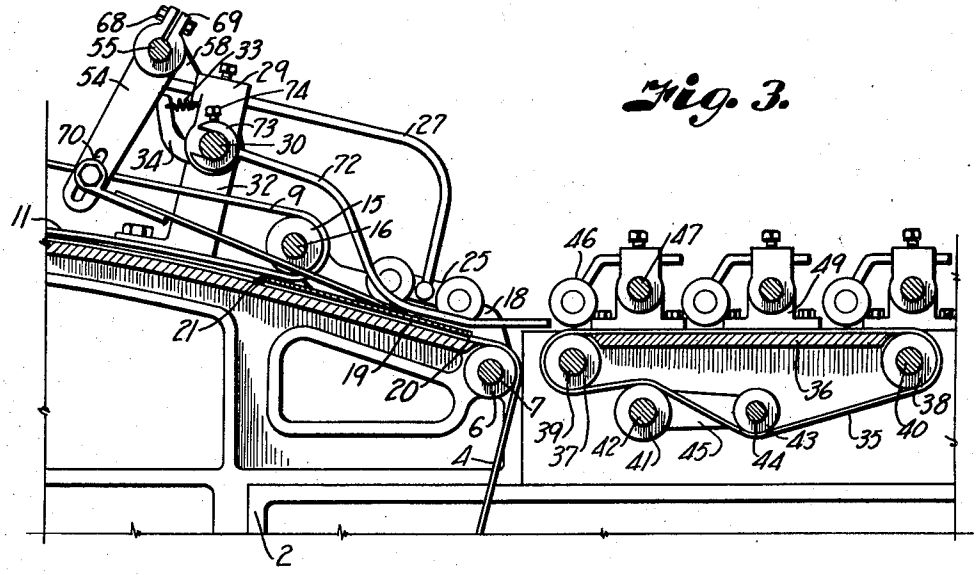


Fig. 4.

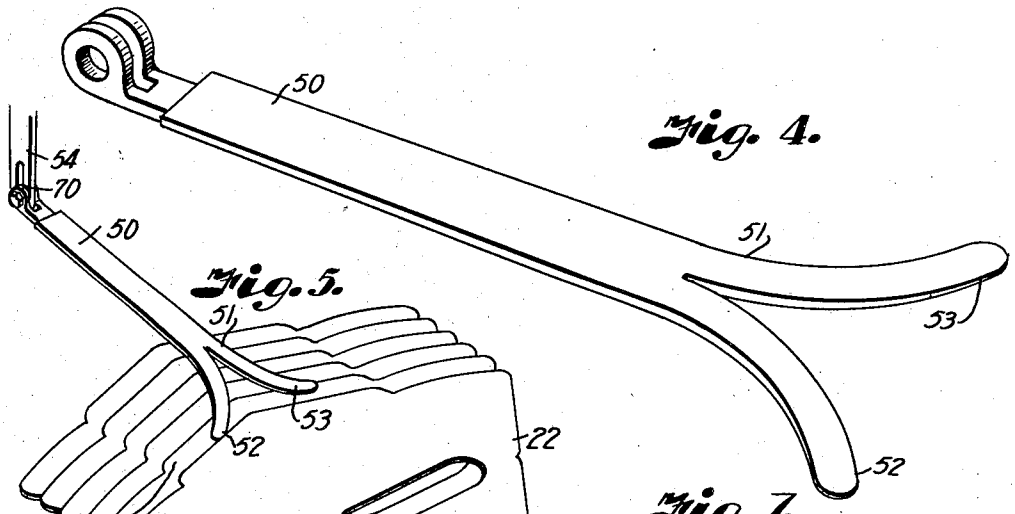


Fig. 5.

Fig. 7.

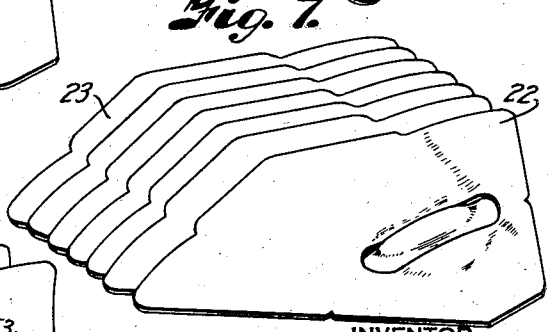
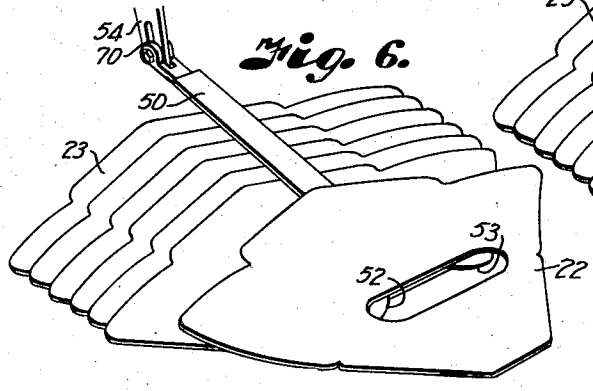


Fig. 6.



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MACHINE FOR MAKING OPEN WINDOW ENVELOPES

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Application August 13, 1934, Serial No. 739,599

11 Claims. (Cl. 271—37)

This invention relates to machines for making open window envelopes and more particularly to a machine of that character wherein the sealing flaps of the blanks are gummed and dried while moving through the machine in fanned-out relation to expose only the portion to which the adhesive is to be applied, and after drying, the blanks are separated for individual travel through the folding mechanism. Separation of the blanks is, however, difficult since they have been pressed together and the natural adhesion of the blanks, static electricity, and burrs produced in the blanking-out process cause the blanks to stick together. Then, when they are engaged by the mechanism for effecting their individual feed, the blanks are distorted and do not retain their flat condition. This distortion of the blanks tends to cause the edges of the window openings to catch on the edges of the window opening of the following blank so that the blank being withdrawn is likely to be torn apart and interfere with the travel of the blanks through the machine.

It is, therefore, the principal object of the present invention to prevent catching of the blanks by providing means operating in synchronism with the blank feeding means to individually release each blank from contact with the succeeding blank so that it is freed therefrom at the time it is gripped by the forwarding mechanism.

In accomplishing this and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a portion of an envelope machine in which the fanned-out blanks are separated for individual advance through the folding mechanism, particularly illustrating the mechanism for effecting disengagement of the blank being separated from the underlying blanks.

Fig. 2 is a plan view of the portion of the machine shown in Fig. 1.

Fig. 3 is a longitudinal section on the line 3—3, Fig. 2.

Fig. 4 is a detail perspective view of the blank separating member.

Fig. 5 is a diagrammatic view of a series of fanned-out blanks showing the separator member in position to move under the foremost blank to effect its disengagement with the underlying blanks.

Fig. 6 is a similar perspective view after the blank has been disengaged by the separating member.

Fig. 7 is a diagrammatic view of a series of blanks in fanned-out relation showing the manner in which the removed blank becomes caught at the time the forwarding means grips the blanks.

Referring more in detail to the drawings:

1 and 2 designate the side frames of a conventional rotary envelope folding machine for manufacturing open window envelopes.

Envelope blanks are carried through the machine in overlapping relation on lower delivering belts 3, 4 and 5 that operate over a roller 6 journalled on a shaft 7 having its ends carried in the side frames 1 and 2. Cooperating with the lower belts are upper belts 8 and 9 having the lower runs 10 and 11 thereof operating on the blanks directly above the upper runs 12 and 13 of the belts 3 and 5 for holding the envelopes in orderly relation.

The upper belts 8 and 9 terminate short of the lower belts and are carried over individual rollers 14 and 15 that are mounted on a shaft 16 which has its ends journalled in arms 17 and 18 carried on the shaft 7 (Figs. 1 and 2).

Extending across the delivery ends of the lower belts is a table 19 closely engaging the upper runs of the lower belts and having its forward edge 20 located adjacent the roller 6 and its rear edge 21 located below the rollers 14 and 15 as shown in Fig. 2, so that the blanks 22 will ride thereover with the trailing edges 23 of a foremost blank spaced from the corresponding edge of a succeeding underlying blank.

While the blanks are moved over the table 19 they are pressed by pairs of rollers 24 and 25 that are carried on the ends of arms 26 and 27 that are adjustably mounted in blocks 28 and 29 loosely supported on a shaft 30 in substantial alignment with the upper belts 8 and 9. The shaft 30 is carried above the ends of the upper belts in brackets 31 and 32 projecting upwardly from the side frames, as shown in Fig. 1.

The pairs of rollers are normally retained in pressing contact with the end flaps of the blanks by springs 33 having one end engaging against the bearing blocks 28 and 29 and their opposite ends against arms 34 projecting from the shaft 30, as best shown in Figs. 1 and 3, the blocks 28 and 29 being loose on the shaft move under action of the springs to exert pressure on the rollers.

Positioned in tandem relation with the conveyor belts just described is a forwarding belt 35 that is driven at a faster speed than the delivery belts so that when the blanks are progressively moved across the table in engagement therewith, the foremost blanks will be successively removed from the table and advanced thereby at greater velocity to effect spaced travel thereof to gluing and folding mechanism (not shown).

The upper run of the forwarding belt operates over a table 36 and is carried on spaced rollers 37 and 38 carried on shafts 39 and 40 having

their ends journalled in the side frames 1 and 2. The belt 35 is retained in taut condition while it is moving over the table 36 by a tensioning device which includes a fixed roller 41 supported on a cross shaft 42 in engagement with the under face of the lower run of the belt and an adjustable roller 43 engaging the upper face thereof and which is supported on a cross shaft 44 having its ends rotatably mounted in arms 45 pivotally carried on the shaft 41. The belt 35 is preferably operated intermittently in timed relation with the folding mechanism and is driven at such a speed that when a blank is engaged thereby it is moved entirely across the length of the conveyor belt before another blank is advanced sufficiently to be engaged therewith to effect the desired spacing of the blanks so that they are advanced through the folding mechanism at proper intervals.

In order to retain the blanks in flat condition against the conveyor belt 35, a series of pressure rollers 46 is provided which operate on the upper face of the belt and are adjustably supported on cross rods 47 mounted in brackets 48 and 49, carried by the side frames 1 and 2.

The natural adhesion of the blanks, static electricity, burrs and the like resist sliding movement of the foremost blank on the underlying blank and cause it to catch so that one edge of the window opening interengages with the edge of the opening in the lower blank, as shown in Fig. 7, unless means is provided to release the blank prior to its movement by the forwarding belt, and thereby avoid tearing of the blank through the window opening incidental to the withdrawing forces being resisted by the holding forces.

To overcome this difficulty in the operation I provide a separating member which is operated in timed relation with the forwarding belt to move between the foremost blank and the next underlying blank, as shown in Fig. 6. The separating member thus raises the central portion of the blank so that the blank is free to be drawn by the forwarding means.

The separating member includes an arm 50 provided with a fork-shaped end 51 having laterally curved feather-edged branches 52 and 53 adapted to bear upon blanks 22 at their near portions 23 as shown in Fig. 5, so that when the separator member is reciprocated in a forward direction, the branches enter between two foremost blanks to raise the central portion of the upper blanks for the purpose described.

In order to reciprocate the separating member, the rear end thereof is suspendingly supported on a rocker arm 54 adjustably clamped to a rock shaft 55 that is mounted in bearings 56 provided on the ends of bracket arms 57 and 58 projecting from the shaft 30, as clearly shown in Fig. 1. Rotatably mounted on the end of the shaft 47 in driving relation with a sprocket wheel 59 is a crank 60 connected by a link 61 with an arm 62 fixed to the outer end of the shaft 55. The sprocket 59 is operated by a chain 63 running over a driving sprocket 64 that is actuated in synchronism with the forwarding belt.

In order to adjust extent of movement of the rock shaft 55, the arm 62 preferably is provided with a slot 65 for mounting the wrist pin 66 which connects the link 61 with the arm. The opposite end of the link is connected with the crank arm 60 by a similar wrist pin 67.

It is apparent that when the crank 60 is rotated through the chain, the arm 62 will be oscillated to rock the shaft 55 which, in turn, effects swinging movement of the arm 54 and reciprocation of the separating member.

The arm 54 is adjustably clamped to the rock shaft 55 by means of a bolt 68 extending through ears 69 in the split hub as shown in Fig. 1. By loosening the bolt, the arm may be pivoted on the shaft 54 to adjustably position the forked end of the separating member so that when it is moved in a retractive position, it will not have moved off of the second blank but will be in position to engage under the foremost blank when the arm is reciprocated in the opposite direction.

In order to adjust the angle of inclination of the separating member and vary the effective lift of the blank, the pivot connection for the rear end of the arm is adjustably mounted in a slot 70.

In order to retain the blanks under control while they are being lifted by the separating member, lift of the outer ends thereof is limited by guard rails 71 and 72 having their rear ends fixed to yokes 73 secured to the shaft 30 by means of set screws 74 and having their forward ends extending downwardly and forwardly to overlie the path of the blanks, thereby preventing withdrawal of the ends of the blanks from engagement with the pairs of pressure rollers 24 and 25.

In operating a machine constructed and assembled as described, and assuming that blanks are being moved by the delivering belts across the table 19 and under the pairs of pressure rollers 24 and 25, the separating arm 50 is adjusted so that the forked ends thereof are in position to move under the sealing flap of the foremost blank when the arm 54 is in retracted position.

This adjustment may be accomplished by loosening the bolt 68 and swinging the arm 54 on the shaft 55 so that the tips of the branches 52 and 53 are resting on the second blank, but are in position to engage under the foremost blank. The angularity of the separating member is then adjusted by moving the pivot connection thereof in the slot of the arm 54, after which the throw of the arm 62 is adjusted to provide the desired stroke of the separating member. This is accomplished by adjusting the bolt 66 in the slot 65.

The separating member being operably connected with the driving mechanism of the forwarding belt 35 is then operated so that it moves under the foremost blank just prior to the time the forward end thereof engages the forwarding belt. The blank is, therefore, moved out of contact with the next lower blank to free it therefrom by the time the forward end thereof is gripped by the forwarding belt. The blank is then free to be withdrawn from the table without catching onto the next lower blank.

From the foregoing it is apparent that upon separation the blank moves in orderly condition across the table 36 for delivery into the gumming and folding mechanism.

What I claim and desire to secure by Letters Patent is:

1. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks to effect individual continuous advancement of the blanks in the same direction, a blank separating member having continuous bearing support on said overlapped blanks and arranged to release the foremost blank from the

adjacent blank, means supporting said separating member for reciprocation between said blanks to effect said separation, and means for reciprocating the separating member.

2. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks to effect individual continuous advancement of the blanks in the same direction, a blank separating member having continuous bearing support on said overlapped blanks and arranged to release the foremost blank from the adjacent blank, means supporting said separating member for reciprocation between said blanks to effect said separation, and means for reciprocating the separating member in timed relation with the forwarding means whereby said blanks are separated prior to movement by said forwarding means.

3. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks for effecting individual continuous advancement of the blanks in the same direction, a shaft oscillatably supported above the conveying means, a rocker arm on the shaft, a blank separating member pivotally supported on said rocker arm and having an end bearing upon said overlapped blanks and adapted to engage between the foremost blank and the adjacent blank to effect separation thereof, and means for oscillating said shaft in timed relation with movement of said forwarding means.

4. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks for effecting individual advancement of the blanks in a continuous direction, a shaft oscillatably supported above the conveying means, a rocker arm on the shaft, a blank separating member pivotally supported on said rocker arm and having an end supported upon the overlapped blanks to engage between the foremost blank and the adjacent blank to effect separation thereof, an actuating arm on said shaft, a crank operably connected in timed relation with the forwarding means, and a link connecting the last named arm with the crank to effect reciprocation of the separating member.

5. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks for effecting individual removal of the blanks from said conveying means, a shaft oscillatably supported above the conveying means, a rocker arm on the shaft, a blank separating member pivotally supported on said rocker arm and having an end adapted to engage between the foremost blank and the adjacent blank to effect separation thereof, means supported above the blanks for limiting upward movement of the foremost blank under influence of said separating member, and means for oscillating said shaft in timed relation with movement of said forwarding means.

6. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks to effect individual removal of the blanks from said conveying means, a blank separating member arranged to release the foremost blank from the adjacent blank, means supporting said separating member for reciprocation between said blanks to effect said separation, means supported above the blanks for limiting movement of the foremost blank by said separating member, and means for reciprocating the separating member.

7. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means for successively engaging the blanks to effect individual advancement of the blanks in a continuous direction, a blank separating member bearing upon the blanks, means supporting said separating member for movement between said blanks to effect separation of said blanks, and means for actuating the separating member to release the foremost blank from contact with the adjacent blank.

8. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means operable in the same direction as the conveying means for successively engaging the blanks to effect individual advancement of the blanks from said conveying means, blank separating means, means supporting the blank separating means for successive retraction over the topmost blank onto the underlying blank and for projection under the topmost blank, and means for actuating the separating means to separate said topmost blank from the underlying blank for individual advancement by the forwarding means.

9. In a machine of the character described, means for conveying blanks in overlapped relation, forwarding means operable in the same direction as the conveying means for successively engaging the blanks to effect individual advancement of the blanks from said conveying means, blank separating means, means supporting the blank separating means for successive retraction over the topmost blank onto the underlying blank and for projection under the topmost blank, and means for actuating the separating means in timed relation with said forwarding means to separate said topmost blank for individual advancement by the forwarding means.

10. In a machine for making open window envelopes, means for conveying blanks having window openings in overlapped relation, forwarding means for successively engaging the blanks to effect individual advancement of the blanks in a continuous direction, blank separating means, means supporting the blank separating means for successive retraction over the topmost blank onto the underlying blank and for projection under the topmost blank to prevent catching of the edges of the window openings in said blanks, means for actuating the separating means to effect said separation of the blanks for individual advancement by the forwarding means, and means for limiting movement of the separated blanks by said separating means.

11. In a machine of the character described, means for conveying blanks having openings therein in overlapped relation, forwarding means for successively engaging the blanks for effecting individual advancement of the blanks in a continuous direction, a shaft oscillatably supported above the conveying means, a rocker arm on the shaft, a blank separating member pivotally supported on said rocker arm and having a forked end bearing upon the overlapped blanks and engaging over the ends of the opening in an underneath blank to effect separation of the foremost blank from the adjacent blank, and means for oscillating said shaft in timed relation with movement of said forwarding means.

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