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J. H. KRAPF

CARTON BLANK SEPARATOR

Filed May 20, 1926 2 Sheets-Sheet 1

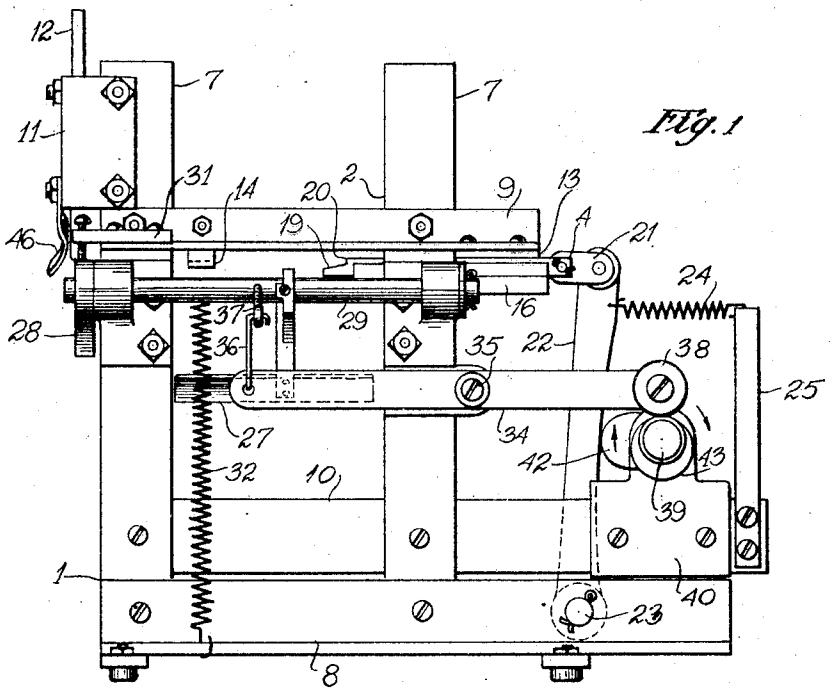


Fig. 1

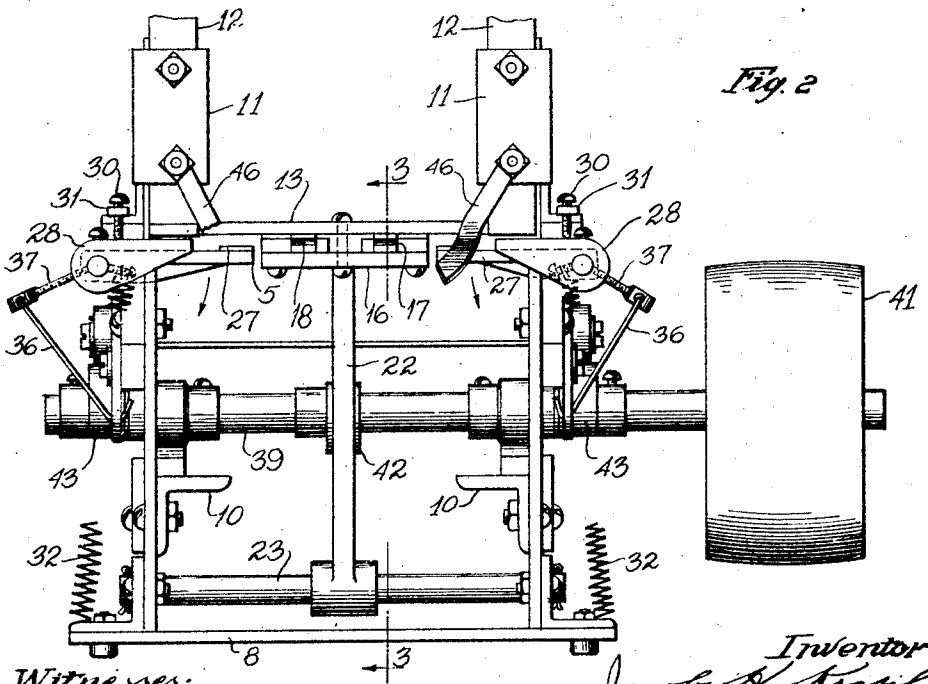


Fig. 2

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Fig. 3

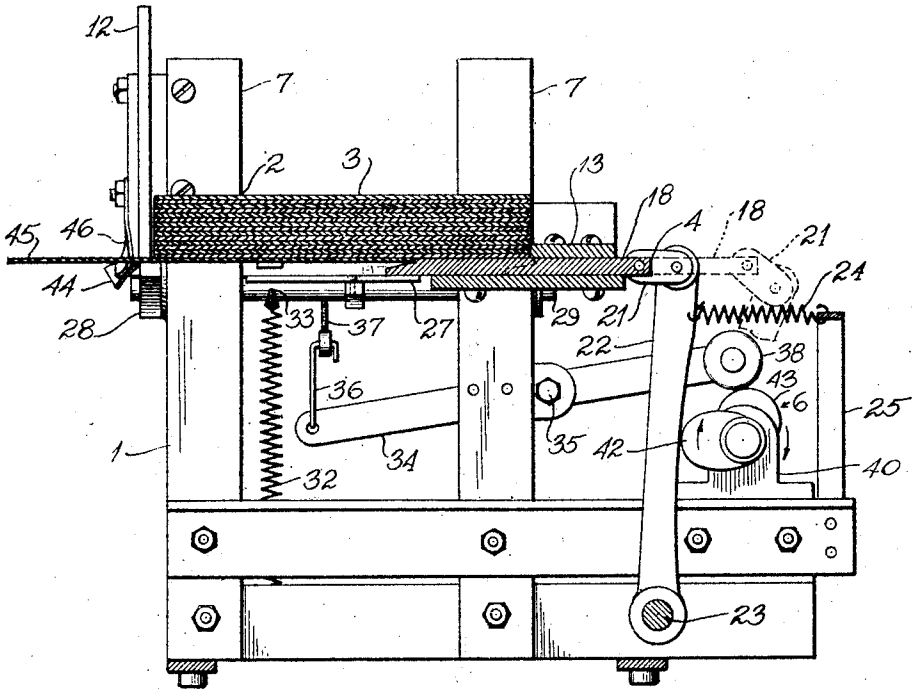
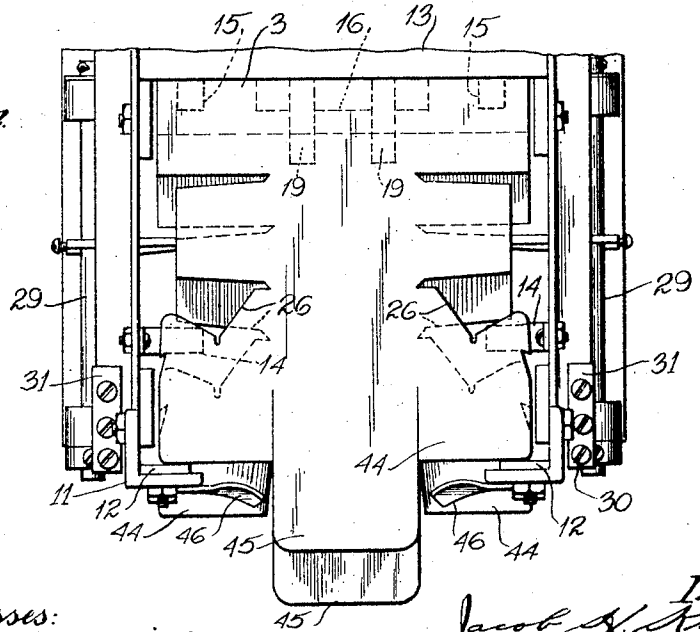


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CARTON-BLANK SEPARATOR.

Application filed May 20, 1926. Serial No. 110,495.

The main objects of this invention are to provide improved means for separating cards, carton blanks and the like from a stack whereby they may be fed to a machine by which they are operated upon individually; to provide an improved separator of this kind whereby the cards may be removed one at a time from the bottom of the stack; and to provide means of this kind which is particularly adapted for use in separating cardboard blanks from a stack so as to permit them to be fed rapidly one at a time to mechanism which folds the blanks into cartons.

An illustrative embodiment of this invention is shown in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a separator to which this invention is applied.

Fig. 2 is an end elevation of the same, taken from the left of Fig. 1, but showing the supporting wings in position for supporting the separated blank.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1, and showing the lowermost blank of a stack in its separated position, the retracted position of the pusher slide being shown in dotted outline.

Fig. 4 is a fragmentary top plan of the device.

A separator embodying this invention may be applied to various types of machines but, in the specific construction herein shown, it is adapted for use in a machine wherein a stack of carton blanks are fed, one at a time, to a mechanism which forms the blank into a carton. Inasmuch as the present invention relates to the separator, parts of the machine not relating thereto and believed unnecessary to a complete understanding of the invention have been omitted from the drawings. As herein illustrated, a stack of blanks is supported in an upright magazine from which the lowermost card is shifted edgewise for separation from the stack by a horizontally reciprocating pusher slide arranged to support one end of the card which is to be separated. Improved means is also provided for supporting the blank in its separated position. To permit the blank to drop from the separator, the supporting means is movable out of supporting position by the operating mechanism which controls the ejector slide.

In the specific construction herein shown, the carton blank separator comprises a frame 1 having an upright magazine 2 for supporting a stack of blanks 3 from which the lowermost card is separated by an improved ejector 4 arranged to shift the blank horizontally onto supporting means 5. The ejector 4 and supporting means 5 are intermittently actuated by a continuously driven operating mechanism 6.

The frame 1 includes upright standards 7 mounted on a base 8 and connected to horizontal braces 9 and 10. The upper parts of the standards 7 form the magazine 2. Mounted on two of the standards at the front side of the magazine, are brackets 11 which support vertical guide bars 12. The guide bars 12 terminate above the plane of the lowermost blank so as to permit the blank to be ejected through the forward end of the frame. The braces 9 project rearwardly beyond the rear standards 7 to provide supports for a horizontal plate 13. Mounted on the braces 9 and plate 13 are inwardly projecting lugs 14 and 15 respectively arranged to support the stack of cards in the magazine. Rigidly mounted on the lower face of the plate 13, is a centrally located block 16 having a pair of substantially parallel guideways 17 for supporting the reciprocating slides of the ejector.

In the form shown, the improved ejector 4 comprises a pair of pusher slides 18 supported in the guideways 17. The forward ends of the slides 18 are recessed to provide bearing surfaces 19 which are arranged substantially in the plane of the lugs 15 so as to support the rear end of the lowermost card at two points adjacent its central portion. The bearing surfaces 19 are inclined downwardly and forwardly so as to permit the lowermost card to sag slightly adjacent its rear extremity. At the rear ends of the bearing surfaces 19, are undercut shoulders 20, which engage the extremity of the lowermost blank for shifting the blank edgewise when the slides are moved forwardly. The shoulders 20 are of less thickness than the blanks, so that they never engage more than one blank at a time. When the slides 18 are retracted to the initial position, shown in dotted outline in Fig. 3, the shoulders 20 are substantially flush with the inner edge of the plate 13 so as to permit the rear end of the lowermost blank to rest upon the bearing surfaces 19. The rear ends of the pusher slides 18 project beyond the guide block 16 and are pivotally connected to a pair of

links 21 carried at the upper end of a rocker arm 22 which is provided at its lower end with a shaft 23 pivoted in the frame 1. The rocker arm 22 is normally urged rearwardly to retract the ejector slides 18 by means of a spring 24, which is connected at one end to the arm 22 and at its other end to a bracket 25 fixed on the frame. The arm 22 is positively urged forwardly against the action of the spring 24 by the operating mechanism 6, hereinafter more fully described, which moves the slides 18 forwardly so as to shift the lowermost blank edgewise from the stack. When the slides 18 reach the limit of their forward movement, the cutaway portions 26 of the separated blank are alined with the supporting lugs 14 and the central and forward parts of the blank are thereby permitted to drop onto the supporting means 5.

In the construction shown, the improved supporting means 5 comprises a pair of wings 27 and a pair of arms 28 fixed on a pair of shafts 29 journaled on opposite sides of the frame 1. The wings 27 and arms 28 are located below the plane of the supporting lugs 14 and extend inwardly into position to support the central portion and forward end respectively of the separated blank. The level of the wings 27 and arms 28 may be readily adjusted by set screws 30 mounted in brackets 31 on the forward standards 7 and arranged to engage the arms 28.

To permit the separated blank to drop from the separator, the wings 27 and arms 28 are swung downwardly to the positions shown in Fig. 1 by means of springs 32. The lower ends of the springs 22 are connected to the base 8 and the upper ends thereof are connected to inwardly projecting pins 33 mounted on the shafts 29. The wings 27 and arms 28 are positively urged upwardly into supporting position by a pair of rocker arms 34 pivoted to the rear standards 7 by pins 35. The forward ends of the arms 34 are provided with links 36 connected to outwardly projecting pins 37 mounted on the shafts 29 so that, when the forward ends of the arms 34 are moved downwardly, the shafts 29 are rocked to move the wings 27 and arms 28 upwardly into horizontal position. Journaled on the rear ends of the rocker arms 34, are rollers 38 which engage the operating mechanism 6.

In the form shown, the operating mechanism 6 comprises a horizontal shaft 39, journaled in brackets 40 fixed on the frame 1, and having a pulley 41 for connection to suitable driving means, not shown, whereby the shaft 39 is rotated continuously. Fixed on the shaft 39, is a centrally located eccentric cam 42 arranged to engage the rocker arm 22 and a pair of end cams 43 located in position to engage the rollers 38 of the rocker arms 34. The cams 42 and 43 are relatively arranged so that when the cam 42 has forced the slides 18 to the limit of their forward movement, the high points of the cams 43 move away from the rollers 38 so as to permit the springs 32 to retract the wings 27 and arms 28.

In the form shown, the carton blanks 3 are slit longitudinally to provide a pair of side wings 44 and a central flap 45. In order to prevent the wings 44 of the lowermost blank from being caught by the flap 45 of the adjacent blank, a pair of inclined fingers 46 are arranged to bend downwardly the wings 44 of the separated blank as it is being projected edgewise through the front of the frame. The fingers 46 are rigidly secured to the front standards 7 and project downwardly across the normal plane of the lowermost blank.

In operation, a stack of carton blanks is placed in the magazine 2, while the pusher slides 18 are retracted, so that the lowermost blank 3 is supported by the lugs 14 and 15 and by the bearing surfaces 19 of the slides. The slides 18 are then moved forwardly under the action of the eccentric 42 so as to push the lowermost blanks edgewise onto the supporting wings 27 and arms 28, which thereupon swing downwardly to permit the separated blank to drop to a conveyer or other suitable mechanism, not shown. The slides 18 then move rearwardly under the action of the spring 24, so as to engage the rear end of the next blank.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A device of the class described comprising a frame having a magazine for supporting a stack of blanks, means for supporting the lowermost blank, an ejector arranged to shift the lowermost blank edgewise for separating it from the stack, and a plurality of fingers pivotally mounted on the sides of said frame for supporting said blank in its separated position, said fingers being movable out of supporting position to permit the blank to drop vertically from such position.

2. A device of the class described comprising a frame having a magazine for supporting a stack of blanks, an ejector having a bearing part located below said magazine in position to support one end of the lowermost blank, said ejector being movable to shift said blank edgewise for separating it from the stack, a pair of shafts journaled on opposite sides of said frame, and fingers on said shafts for supporting said blank in

its separated position, said shafts being rotatable for moving said fingers out of supporting position to permit the blank to drop vertically from such position.

3. A device of the class described comprising a frame having a magazine for supporting a stack of blanks, means for supporting the lowermost blank, an ejector arranged to shift the lowermost blank edgewise for separating it from the stack, other means for supporting said blank in its separated position, and mechanism for moving said other means out of supporting position to permit the blank to drop when said ejector reaches the limit of its forward movement.

4. A device of the class described comprising an upright magazine having means at its lower end for supporting a stack of cards, a reciprocating pusher slide having a bearing part located below said magazine in position to support one end of the lowermost blank, a shoulder on said slide arranged to engage the extremity of the lowermost blank for shifting said blank edgewise to separate it from the stack and to disengage it from said supporting means, other means disposed below the plane of said first mentioned means for supporting the card in its separated position, and mechanism for moving said other means out of supporting position to permit the card to drop when said pusher slide reaches the limit of its forward movement.

5. A carton blank separator comprising a frame having an upright magazine for supporting a stack of blanks, an ejector arranged to move the lowermost blank edgewise through an opening in one side of said magazine, and a pair of fingers on said frame projecting across said opening in the path of the lowermost blank for bending its forward end away from the remainder of the stack.

Signed at Chicago this 15th day of May, 1926.

JACOB H. KRAPF.