May 5, 1953 K. F. NEWELL 2,637,451

DEVICE FOR REMOVING CARDS FROM BETWEEN STACKED ARTICLES

Filed Feb. 7, 1951 4 Sheets-Sheet 1

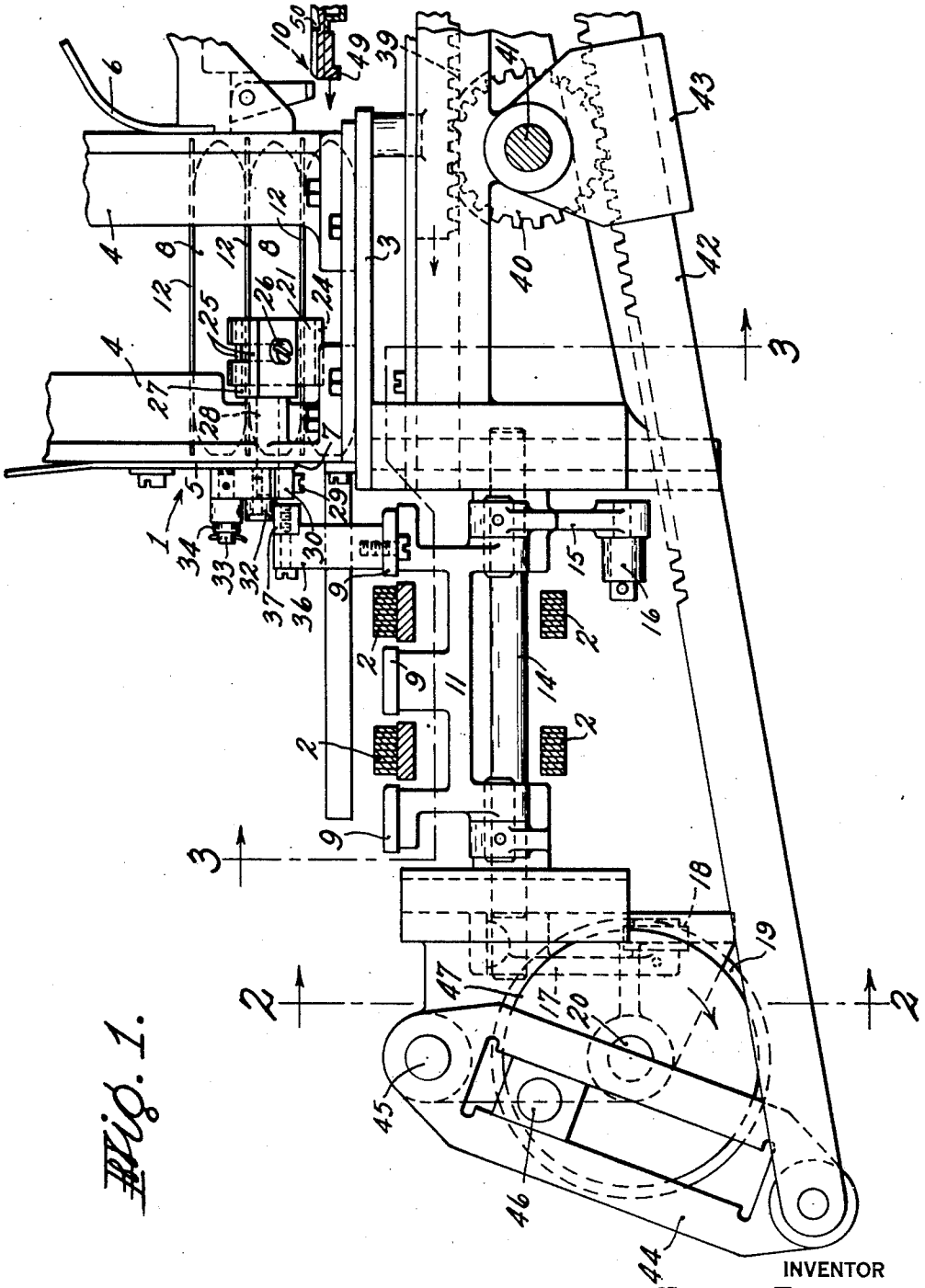


Fig. 1.

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Fig. 2.

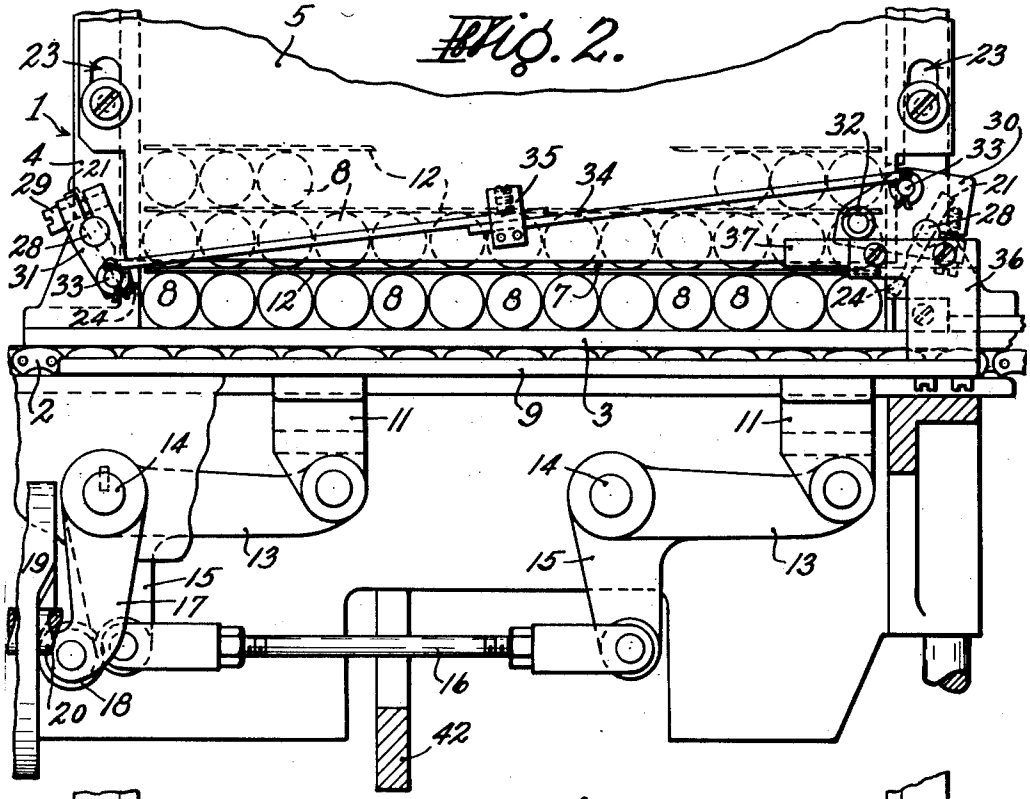
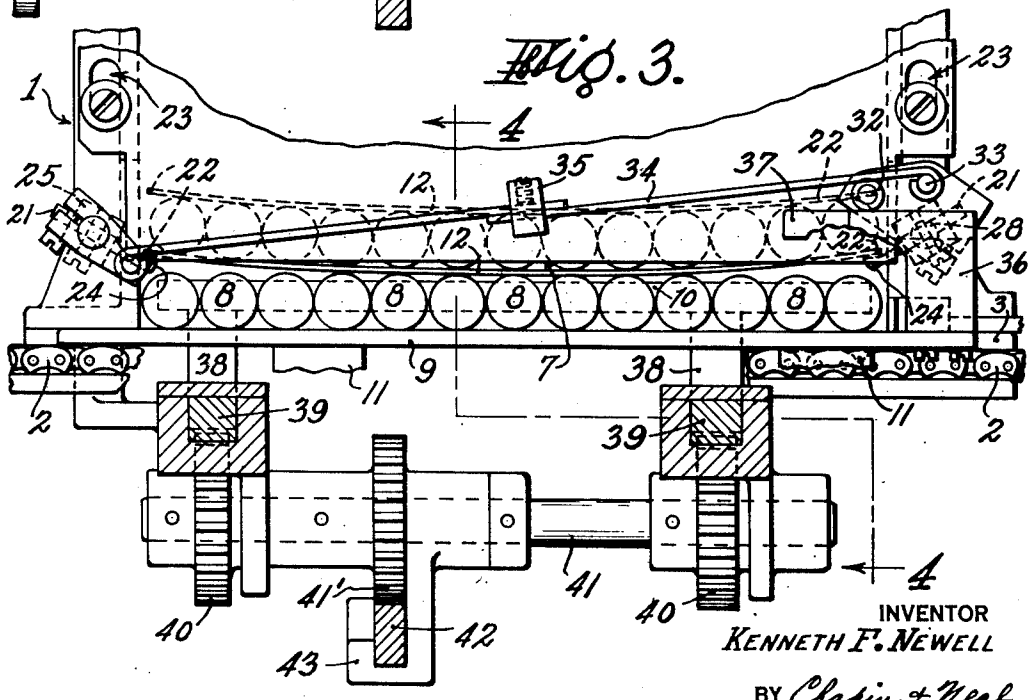


Fig. 3.



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Fig. 4.

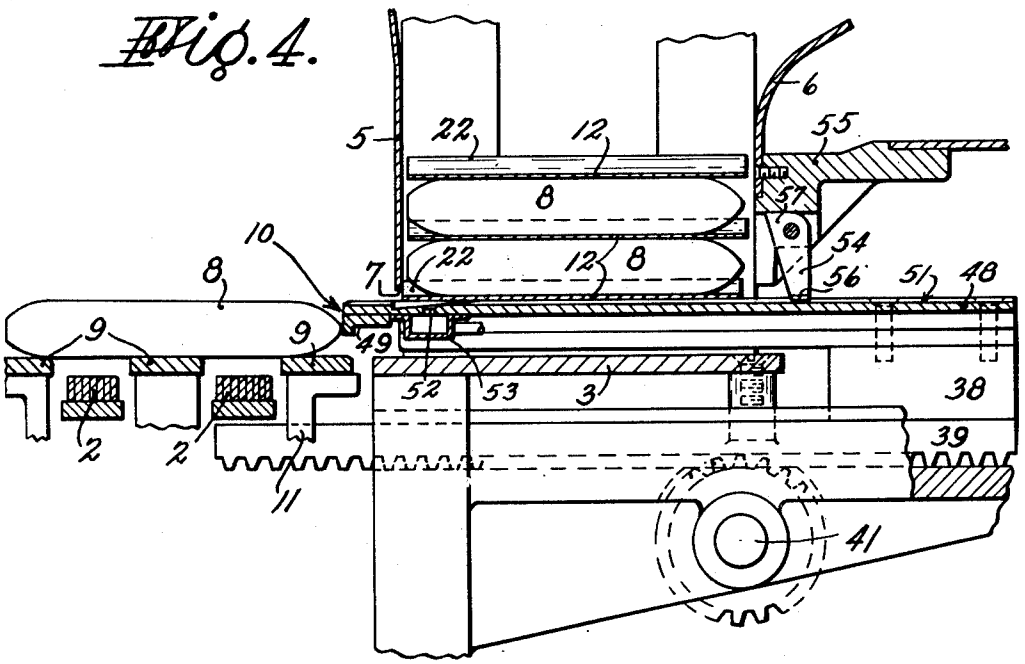
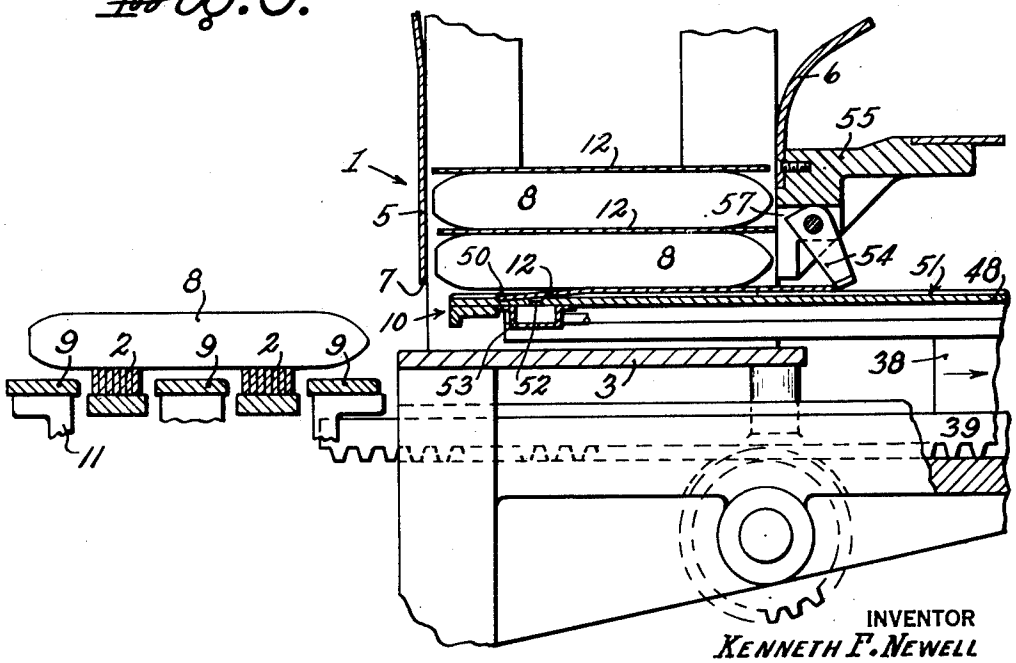


Fig. 5.



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Fig. 6.

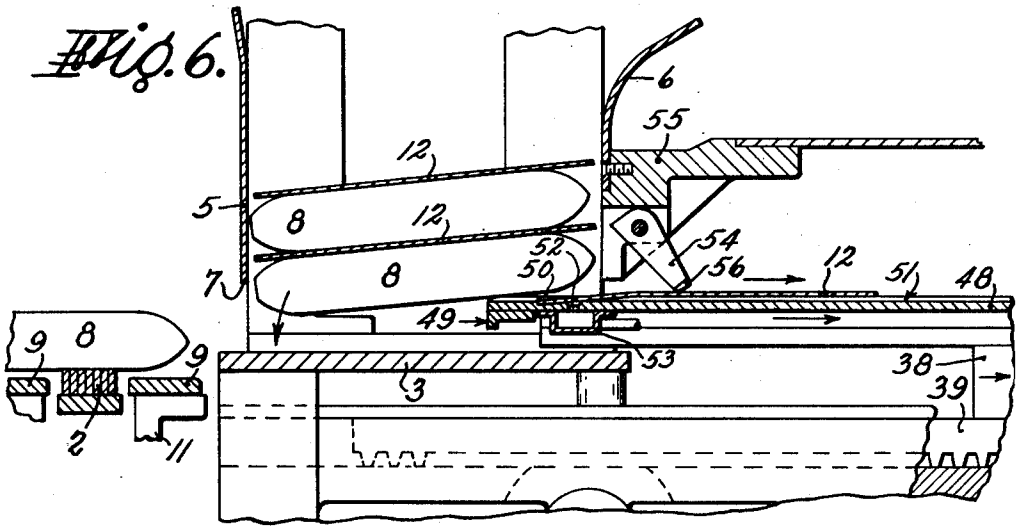


Fig. 7.

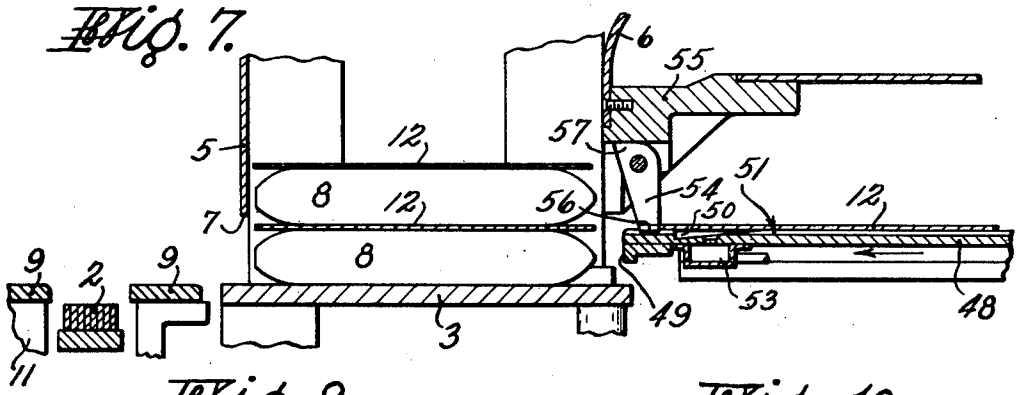


Fig. 8.

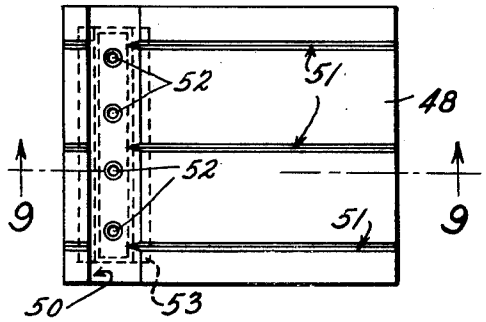


Fig. 10.

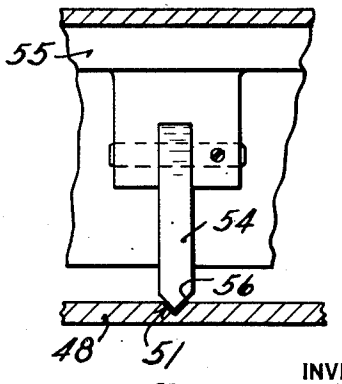
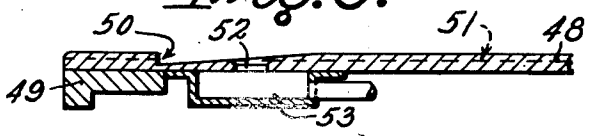


Fig. 9.



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Patented May 5, 1953

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UNITED STATES PATENT OFFICE

2,637,451

DEVICE FOR REMOVING CARDS FROM BETWEEN STACKED ARTICLES

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Application February 7, 1951, Serial No. 209,842

7 Claims. (Cl. 214—8.5)

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This invention relates to a device for discharging rows of cigars from a magazine to the infeeding mechanism of a wrapping machine, banding machine or the like.

As the cigars are manufactured, or accumulated following the manufacturing operation they are commonly stacked in rows, each row resting on a card or sheet of relatively stiff cardboard. When the cigars are placed in the magazine from which they are to be discharged in rows into a conveyor or other means from, or by, which they are fed to a wrapping machine, for example, it has been customary either to remove the separating cards from between the layers before the cigars are placed in the magazine or as the cigars are discharged from the magazine. This procedure has usually involved a hand operation and furthermore, when the cards are removed before the cigars are placed in the magazine, has deprived the cigars of the protection afforded by the cards during the time that they are in the magazine, and as they are being fed therefrom.

It is the principal object of the present invention to provide a discharge means which will permit the separating cards to remain between the layers of cigars when they are placed in the magazine and which provides means to automatically remove the cards individually from the magazine just prior to the discharge of the row of cigars which rested upon it.

Other and further objects residing in the details of the construction will be made apparent in the following specification and claims.

In the drawings,

Fig. 1 is a side view, partly in section, of the discharging device;

Fig. 2 is a sectional view of the device taken approximately on line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the device taken approximately on line 3—3 of Fig. 1;

Fig. 4 is a sectional view on line 4—4 of Fig 3;

Figs. 5, 6 and 7 are views similar to that of Fig. 4, with some of the parts not shown, for clarity, and showing successive stages of operation of the device;

Fig. 8 is a plan view of the discharge pusher of the device;

Fig. 9 is an enlarged sectional view on line 9—9 of Fig. 8; and

Fig. 10 is a detail in elevation of a detent finger shown, e g., in Fig. 7.

As shown in the drawings, a cigar magazine 1 is positioned at one side of a conveyor comprising two endless chains 2 which may be constantly operated to advance cigars to wrapping and/or banding instrumentalities. The magazine comprises a floor plate 3, four upstanding side members 4, a front plate 5 and a rear plate 6, flared as shown, to facilitate insertion of cigars in the magazine. The discharge opening 7 through which a row of cigars 8 is discharged endwise from the front of the magazine is on an elevation above the surface of the conveyor. A cigar receiving means comprising three flat rails 9 is adapted to be moved from a position slightly below the surface of the conveyor to a position substantially on a level with the floor plate 3 at the bottom of the magazine. When the rails are in raised position the bottom row of cigars 8 is pushed from the magazine onto the rails by means of a reciprocating pusher 10.

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The chains 2 of the conveyor may be driven in any suitable manner, either continuously or intermittently, according to the requirements of the cigar wrapping machine.

It will be noted that the three rails 9 are spaced to avoid interference with the chains 2 (Fig. 1). The rails themselves are carried on integral brackets 11 which are raised and lowered by means of a driving connection to be described later.

As will be made clear hereinafter, the separating cards, indicated at 12, which are inter-leaved with the rows of cigars in the magazine, are removed from the magazine on the rearward stroke of the pusher 10. The magazine is therefore preferably loaded with the pusher in its advanced position (Fig. 4), so that upon the first rearward stroke of the pusher, the lowermost card 12 is removed from the magazine, leaving the lowermost row of cigars resting on the floor plate 3 of the magazine. With the row of cigars 8 in this position they will be discharged from the magazine upon the next forward stroke of the pusher. Of course, the magazine may be loaded with the pusher in its rearmost position and the bottom card removed by hand. The first stroke of the pusher in this case will discharge the bottom row of cigars.

Before the pusher 10 begins its advance stroke to discharge the row of cigars 8, the rails 9 must be raised from their position below the level of the conveyor (Fig. 2) to a position level with the floor plate 3 of the magazine, to receive the cigars (Fig. 3). For this purpose, the rail supporting brackets 11, as shown in Fig. 2, are mounted on link arms 13 which in turn are fixed on parallel oscillating rocker shafts 14. The rocker shafts are provided with bell cranks 15

which are pivotally connected at their lower ends by a link 16. By means of the link and bell shaft 14 for an identical motion. To provide crank connection, rotation of one rocker shaft 14 is transmitted directly to the other rocker oscillating rotation to the rocker shafts 14, a crank arm 17 is fixed on one of the shafts 14 as shown. The lower end of the crank arm is provided with a cam roll 18 which is adapted to bear on a crown cam 19 which is rotated continuously by a drive shaft 20. Continuous rotation of the drive shaft 20 is translated, by means of the cam and link connection just described, into a substantially vertical oscillation of the rails 9.

The shaft 20 may conveniently be driven by means connected with the wrapping or packaging machine, or in any other suitable manner.

Before the pusher advances to discharge the row of cigars 8 and before the rails 9 are raised as just described from their position below the conveyor, the card 12 immediately overlying the lowermost row of cigars 8 lies flat inside the magazine 1, just below the upper edge of the discharge opening 7 (Fig. 2). When the pusher moves forward in the magazine to discharge the bottom row of cigars 8, it tends to frictionally push the overlying card 12 out of the magazine with the cigars. To prevent the card 12 from being discharged with the cigars 8, finger members 21 are provided at the sides of the magazine to engage the edge portions 22 of a card to flex the same upwardly and hold them above the upper edge of the discharge opening 7 and in abutting relation with the interior of the front plate 5 of the magazine. This condition is shown by Fig. 3. It will be noted the height of discharge opening 7 may be adjusted by moving the front plate 5 of the magazine vertically in a pin and slot connection at 23.

As shown in Fig. 1, each finger 21 comprises a bifurcated plate having a lower extended curved tip 24 for engagement with the edge portion of a card 12. The finger is held in a slotted block 25 by a set screw 26 which passes through the block 25 between the legs of the bifurcated finger plate. Integrally connected to the base piece 27 of the block 25 is a shaft 28, journaled in the frame, which extends from inside the cigar magazine to the outside front thereof. As shown in Fig. 2, the outer ends of shafts 28 carry respective cranks 30 and 31 secured thereto by set screws 29. The cranks 30 and 31 are connected by a link 34, the ends of which are pivotally connected to the cranks at 33. The length of link 34 is made adjustable as at 35.

Plate 30 carries a cam roll 32, positioned to be engaged by a cam bar 37 carried by a bracket 36 secured to one of the rails 9. As the rails 9 are moved upwardly into position to receive a row of cigars from the magazine, roll 32 is engaged by bar 37 to rock crank 30, and through link 34, crank 31, to simultaneously swing the fingers 24 inwardly as shown in Fig. 3, and bend the sides of the lower card 12 upwardly behind the front plate 5 of the magazine. Card 12 is thus held against movement as the lower row of cigars is transferred to the rails 9 by the pusher 10.

The mechanism for actuating the pusher is also driven by the drive shaft 20 which actuates the rails 9 and the fingers 21. When the rails 9 are in their raised position (Fig. 3) the pusher begins its discharge stroke. The pusher is mounted adjacent its rearmost portion on two spaced support blocks 38 which in turn are carried on spaced parallel gear racks 39. The racks 39 are reciprocated in the line of movement of the pusher by two pinions 40 mounted on a common shaft 41. A link 42 (Fig. 1) is provided with integral gear rack held against one of the pinions 40 by a yoke 43. Link 42 is pivoted to one end of a slotted crank arm 44 on one side of the drive shaft, the other end of arm 44 being pivoted on the other side of the drive shaft at 45 to a supporting frame structure. The crank arm 44 is oscillated by a crank pin 46 carried on a disc 47 which is fixed for rotation on the drive shaft 20. As the drive shaft 20 rotates continuously in one direction, the pinions 40 are oscillated by the crank arm 44 and link 42 to impart a horizontal reciprocation to the gear racks 39 and the pusher 10.

The pusher itself, as best shown in Figs. 4 to 9 comprises a flat plate 48 having a head 49 at its forward end for engaging the ends of the cigars. The upper surface of the pusher is provided with spaced grooves 51 parallel to each other and to the line of movement of the pusher.

Rearwardly of the head 49 the pusher is provided with a transverse groove 50 the floor of which is inclined forwardly from its rear edge to a depth at its forward edge at least equal to the thickness of the cards 12. The floor of the groove is provided with a plurality of openings 52 which communicate with a suction box 53 which is exhausted through suitable control valves not shown.

Pawls as detent arms 54 are pivoted for free swinging on a horizontal brace member 55 on the rear plate 6 of the cigar magazine. The lowermost ends 56 of the arms are pointed (Fig. 10) to fit in the grooves 51 of the pusher plate. Each detent arm 54 has at its upper portion an integral foot 57 (Fig. 7) which abuts the under surface of the horizontal brace member 55 on the rear of the magazine frame to limit the movement of the detents toward the magazine. The detents are free to swing away from the magazine.

As the pusher begins to withdraw from the magazine 1 after having deposited a row of cigars 8 on the rails 9, the rails are lowered, fingers 24 are withdrawn and the overlying card 12 which has been held by the fingers is permitted to drop under the weight of the overlying cigars onto the pusher plate 48. Suction is applied to box 53 to draw the forward edge of the card into the groove 50, as shown in Fig. 5, so that as the pusher moves rearwardly the outer edge of the card is engaged by the shoulder of groove 50.

As the pusher 10 continues to shift out of the magazine, the overlying card 12 is thus carried with it. The detent arms 54 at this stage swing sway from the magazine with their lower ends 56 riding over the card 12, and when the pusher reaches the rearmost point of its withdrawal stroke (Fig. 1) the suction is released and the detent arms 54 hang vertically in front of the pusher head 49. When the pusher commences its next forward stroke, the lower end portions 56 of the detent arms slide through the notches 52 and grooves 51 and the card 12 is stripped rearwardly off the advancing pusher plate 48.

In this manner, the cards 12 are disposed of without interfering in any way with the discharge of the cigars from the magazine to the conveyor.

What is claimed is:

1. A device for discharging rows of cigars or similar articles successively from a magazine and for discharging from the magazine separating cards, inter-leaved with the rows of articles.

which comprises, receiving means movable from a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, retaining means, actuating means carried by the receiving means and positioned to engage said retaining means upon upward movement of the receiving means and move said retaining means into engagement with the card immediately overlying the lowermost row of articles and hold the same against movement by the pusher, said retaining means being released from said actuating means upon downward movement of the receiving means, and means carried by the pusher to withdraw said card rearwardly from the magazine upon the return movement of the pusher.

2. A device for discharging rows of cigars or similar articles successively from a magazine and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises, receiving means movable from a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, retaining means including opposed retaining fingers, actuating means carried by the receiving means and positioned to engage said retaining means upon upward movement of the receiving means to move said fingers into engagement with the opposite side edge portions of the card immediately overlying the lowermost row of articles in the magazine and hold the card against movement by the pusher, said retaining means being released from said actuating means upon downward movement of the receiving means to permit said card to be withdrawn rearwardly from the magazine by the pusher upon the rearward movement of the latter, and means at the rear portion of the magazine to strip said card rearwardly off the pusher upon the advance movement thereof.

3. A device for discharging rows of cigars or similar articles successively from a magazine and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises, receiving means movable from a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, retaining fingers, means carried by the receiving means to actuate said fingers upon upward movement of the receiving means to engage the card immediately overlying the lowermost row of articles in the magazine and hold the card against movement by the pusher, said fingers being released upon downward movement of the receiving means, and the pusher being formed with a shoulder to engage the forward edge of the card and withdraw said card rearwardly from the magazine upon the return movement of the pusher.

4. A device for discharging rows of cigars or similar articles successively from a magazine and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises, receiving means movable from

a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, retaining means, means carried by the receiving means to actuate said retaining means upon upward movement of the receiving means to engage opposite side edge portions of the card immediately overlying the lowermost row of articles in the magazine and hold the card against movement by the pusher, said retaining means being released upon downward movement of the receiving means, and means carried on the forward edge of the pusher to withdraw said card rearwardly from the magazine upon the return movement of the pusher.

5. A device for discharging rows of cigars or similar articles successively from a magazine and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises receiving means movable from a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, retaining means, means carried by the receiving means to actuate said retaining means upon upward movement of the receiving means to engage opposite side edge portions of the card immediately overlying the lowermost row of articles in the magazine and hold said card against movement by the pusher, said retaining means being released upon downward movement of the receiving means, a shoulder forming groove formed in the pusher adjacent its forward edge and positioned to underly the forward edge of said card when the pusher is in its foremost position, and suction means to draw the edge of the card into said groove to withdraw said card rearwardly from the magazine upon the return movement of the pusher, and pawls pivoted rearwardly of the magazine in the path of movement of the card to strip the same rearwardly off the pusher upon the advance movement thereof.

6. A device for discharging rows of cigars or similar articles successively from a magazine having a discharge opening for the purpose and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises, receiving means movable from a position below the magazine to a position to receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, a pair of fingers positioned respectively at opposite sides of the magazine, and means carried by the receiving means to move said fingers into engagement with the adjacent side edge of the card immediately above the lowermost row of articles in the magazine on the upward movement of said receiving means and bend said edges above the magazine discharge opening.

7. A device for discharging rows of cigars or similar articles successively from a magazine having a discharge opening for the purpose and for discharging from the magazine separating cards, inter-leaved with the rows of articles, which comprises, receiving means movable from a position below the magazine to a position to

receive the row of articles as the latter are discharged from the magazine, reciprocable pusher means for advancing the lowermost row of articles in the magazine onto the receiving means when the latter is in raised position, a pair of fingers positioned respectively at opposite sides of the magazine and secured to shafts extending forwardly of the magazine, a rotatable crank plate secured to each of said shafts, one of said plates carrying a cam roll, a link connecting said plates, and a cam carried by the receiving means and engageable with said roll, upon upward movement of the receiving means, to rotate said shafts and bring the fingers carried thereby into engagement with the side edge portions of the card immediately overlying the lowermost

row of articles in the magazine and flex the same above the magazine discharge opening, said fingers being released upon downward movement of the elevator to permit said card to be withdrawn rearwardly from the magazine by the pusher upon the rearward movement of the latter.

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