Dec. 3, 1929. G. W. HAMAN ET AL 1,738,103

AUTOMATIC STOP DEVICE

Filed July 23, 1928 3 Sheets-Sheet 1

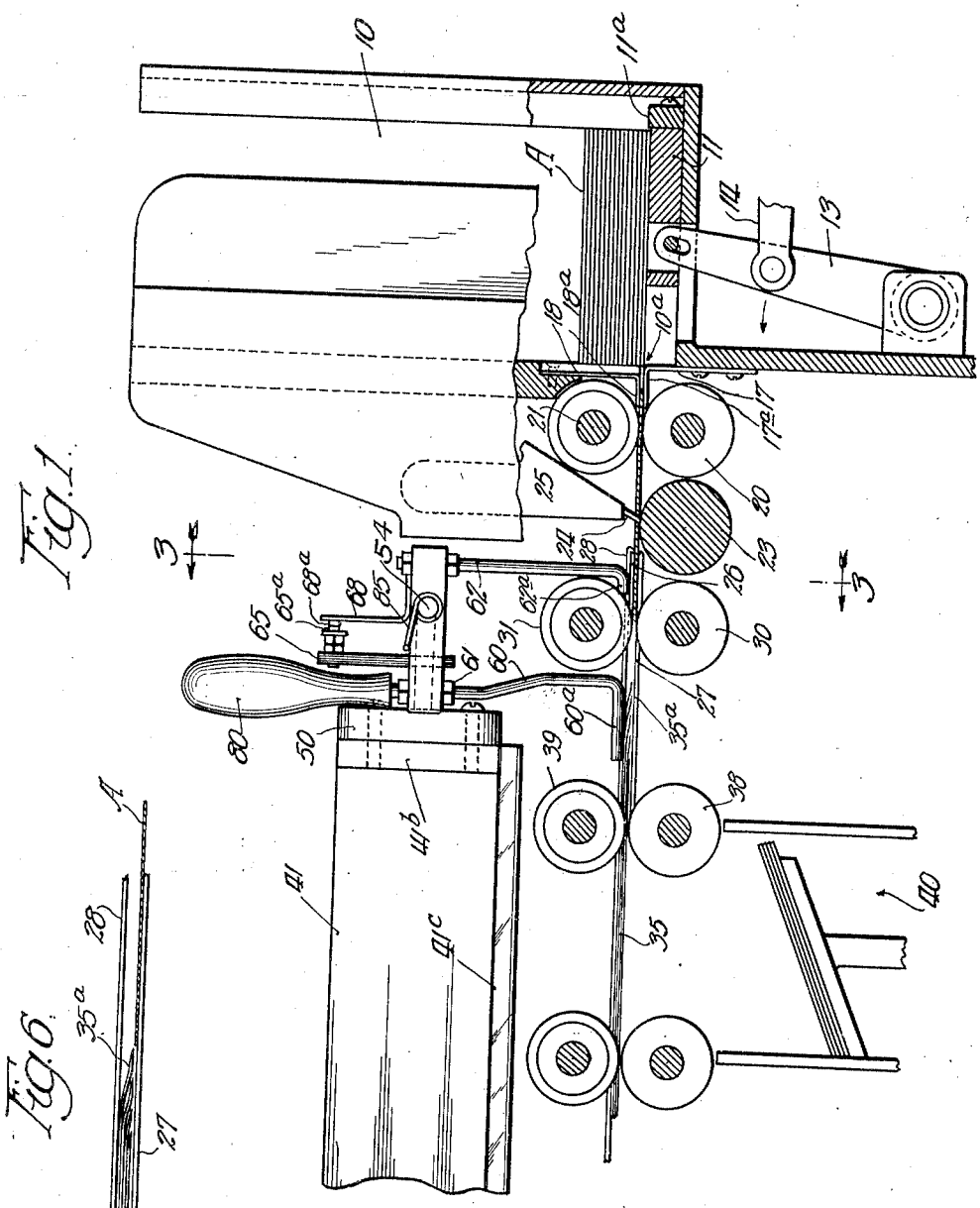


Fig. 1.

Fig. 6.

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AUTOMATIC STOP DEVICE

Filed July 23, 1928 3 Sheets-Sheet 2

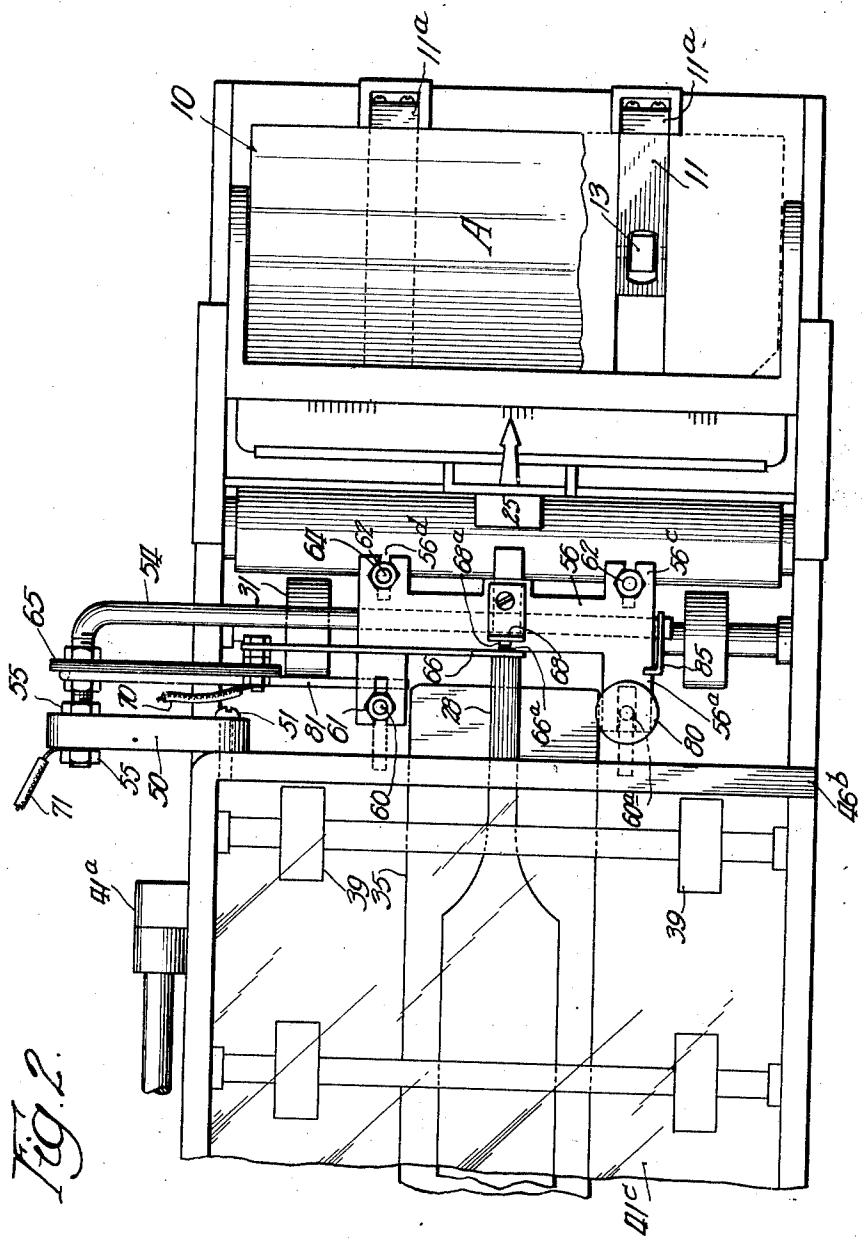


Fig. 2.

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Filed July 23, 1928 3 Sheets-Sheet 3

Fig. 5.

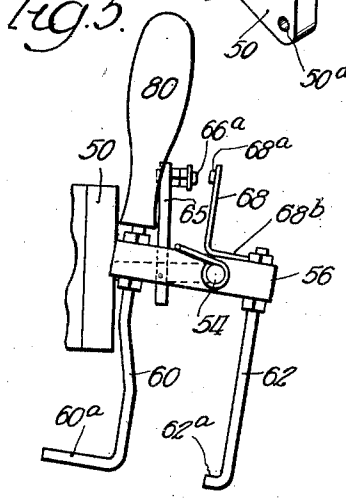
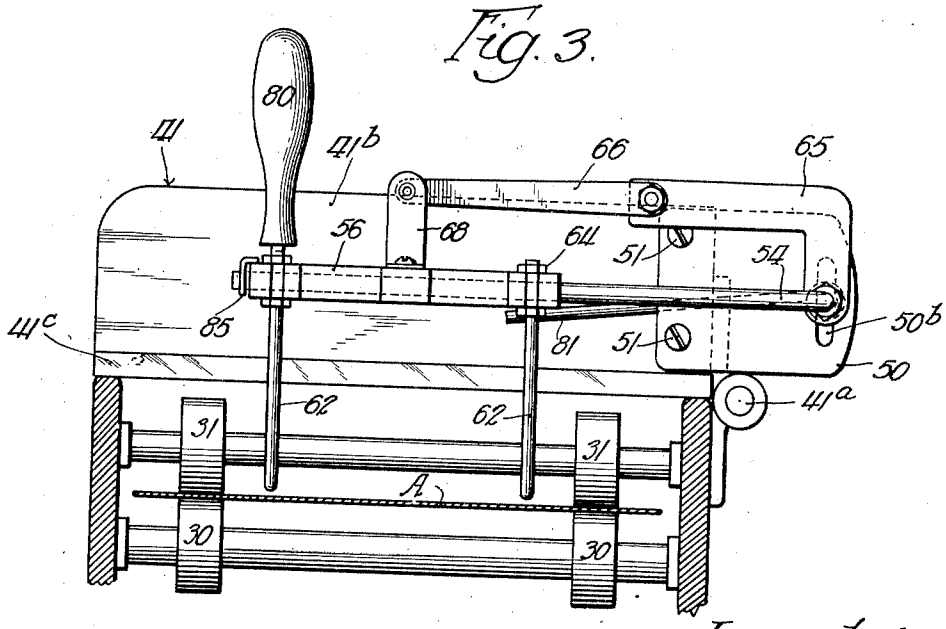


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE

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AUTOMATIC STOP DEVICE

Application filed July 23, 1928. Serial No. 294,804.

This invention relates to automatic stop devices, and has for an object to provide a mechanism which will quickly cut off an operating feeding mechanism. It is particularly adapted for use with a high speed power actuated article feeding mechanism, and more particularly adapted to such mechanisms designed for the handling of planiform articles, such as cards or sheets. Another object consists of the provision of a device of the character indicated, which is actuated by the articles themselves when any portion thereof projects out of the normal path of travel, as for example, when a card is warped or torn, the warped or torn portion will actuate such stop device.

These and other objects will be more fully set forth and described in the following specification and shown in the accompanying drawings, in which

Fig. 1 is a vertical section through a card sorting machine showing our stop device attached thereto;

Fig. 2 is a plan view of the same;

Fig. 3 is a vertical section along the line 3—3;

Fig. 4 is a perspective of the stop device itself;

Fig. 5 is an end elevation of the stop device as attached to the sorting machine showing the same in circuit breaking position; and

Fig. 6 is a detail of the card classifying means drawn to an enlarged scale.

As stated, our stop device is particularly designed and adapted for attachment to a card sorting mechanism, although it may be readily adapted for use with other machines of a generally similar nature.

In the drawings 10 designates the card magazine or hopper showing a plurality of cards A in the lower portion thereof. These cards rest upon a reciprocating feed block 11 having the vertically adjustable card engaging cleat 11^a arranged to pick up a single card in its reciprocation to the left, as viewed in Fig. 1. A crank 13 is illustrated as pivotally attached to the block 11 and reciprocated in turn by a connecting rod 14 which is connected to any suitable source of power as an electric motor. At the front of the magazine 10 is provided an outlet 10^a. A lower gate 17 is secured to the front of the magazine and is provided with the outwardly turned upper flange 17^a. An upper gate 18 is provided with a similarly outwardly disposed flange 18^a, the flanges 17^a and 18^a being spaced apart sufficiently to permit the free exit of a single card. In advance of the outlet 10^a is a pair of co-acting opposed feed rolls 20 and 21, between which the cards are singly fed and by which the feeding is continued. In advance of the lower roll 20 is a contact roll 23 with which co-acts a brush 24 carried by the arm 25. In advance of the contact roll 23 a throat 26 is formed by spaced strips 27 and 28, at either side of which are provided additional opposed feed rolls 30 and 31 which in turn receive the advancing cards singly and continue their travel.

A plurality of superposed switch plates 35 are provided, their forward ends 35^a being arranged sequentially, as illustrated in Fig. 6 for example, the uppermost plate 35 having its end projecting farthest toward the front of the machine and the plates below it having their forward ends arranged in sequence as illustrated. At either side of the switch plates 35 are additional feed rolls 38, 39, and similar co-acting sets of rolls are provided throughout the entire length of travel of the cards.

The sorting mechanism which is not our invention, but is of well known construction and operation, includes magnets (not shown) which co-act with the switch plates 35, the contact roll 23 and the brush 24, so that apertures or punch holes in the cards control selected magnets to determine which of the switch plate ends 35^a will be drawn down to encounter and switch the cards being fed through. This operation is well known and needs no further description beyond stating that for example, if the end 35^a of uppermost switch plate 35 is drawn down by its magnets, the card A next passing through will ride upon the upper switch plate and be carried through the machine by the feed rolls to its deposit compartment. Where a card passing through has no punch holes in alignment with the brush 24, it will pass beneath

all of the switch plates 35 and be deposited in a separate compartment which we have indicated by numeral 40.

A cover generally indicated by numeral 41 is hinged at 41ª (see Fig. 2) at one side of the machine, and is constructed with a front wall or flange 41ᵇ and the glass cover plate 41ᶜ as illustrated in Fig. 1.

A block 50 is secured by machine screws 51 or the like extended through the apertures 50ª to the front wall 41ᵇ at one side of the cover, as illustrated in Figs. 1, 2 and 3 for example. This block is provided with an attachment slot 50ᵇ near one side and spaced from the cover 41 of the machine. A hinge rod 54 is provided, having its end 54ª angularly formed and threaded for projection through the slot 50ᵇ in which it is secured by the clamping nuts 55, which arrangement permits vertical adjustment of the rod 54.

Rotatably mounted upon the rod 54 is the carrier 56 having the forwardly projecting arms 56ª slotted at 56ᵇ and the rearwardly projecting lugs 56ᶜ also slotted at 56ᵈ. Stop fingers or members 60 are adjustably secured in the slots 56ᵇ by means of clamping nuts 61 or the like, and these stop fingers are forwardly turned or bent at their lower ends as indicated by numeral 60ª. Generally similar stop fingers 62, provided with forwardly turned lower ends 62ª, are clamped in the slots 56ᵈ by nuts 64, as illustrated in Fig. 4. While we have shown two pairs of stop fingers, it will be apparent that this number may be varied as found desirable to meet varying conditions.

Mounted upon the angularly bent portion 54ª of hinge rod 54 is the arm 65 of insulating material which is provided with the binding post 65ª. From this binding post 65ª extends a spring contact arm 66 having a contact point 66ª at its free end (see Figs. 1 and 2). A second contact arm 68 having the contact 68ª is provided, the same being attached by its bent base portion 68ᵇ to the top of the carrier 56 (see Fig. 4).

In the form illustrated, the current wire 70 is secured to the binding post 65ª and a ground wire 71 is secured to the threaded end 54ª of the hinge rod 54. These wires form part of the circuit which may either include the electric operating motor which actuates the feeding mechanism of the machine, or they may be connected to a relay which controls the main switch of the motor. Since the motor and switch form no separate part of my invention, we have not felt it necessary to illustrate them, as the arrangement is well known to those skilled in the art.

With the mechanism in normal position as illustrated in Fig. 4, the contacts 68ª and 66ª will meet and the circuit through the switch or motor will be closed. One of the arms 60 is provided with an upwardly extending manually engageable handle 80. Should the arms 60 or 62 be struck by anything traveling through the mechanism, or the operator properly move the handle 80, the carrier 56 will be rotated to the position illustrated in Fig. 5, separating the contacts 66ª and 68ª and breaking the controlling circuit, which would preferably be of such a character as to require manual operation of the main switch before the machine could be restarted.

The stop device is preferably located with the fingers 62 at or adjacent the entrance to the throat 26 and with the lower ends 62ª just above the plane or path of travel of the cards A. The fingers 60 are located at or adjacent the passage of the cards beneath or upon the switch plates 35, and we find it desirable to make the ends 60ª substantially co-extensive with the switching zone, which is the zone including all of the ends 35ª of the switch plates. The fingers 60 should be positioned with the ends 60ª just above the normal path of any of the cards being shunted or switched by the switch plates.

A light spring 85 is provided having one portion attached to the hinge rod 54 and its free end overlying and engaging the adjacent arm 56ª, this spring lightly urging the carrier 56 to contact closing position, as illustrated in Fig. 1 for example. A stop rod 81 is clamped against the fixed arm 65 and projects into the path of travel of one of the fingers 62 to limit the contact breaking movement of the carrier 56.

Machines of the character illustrated feed the cards at a high rate of speed, and it occasionally happens that a card is warped or torn and fails to enter the throat 26 or jams at the switch zone, and before the machine can be shut off a large number of cards have been jammed and torn, and in many instances hours of time are required in extracting and piecing together the cards. As is well known to those skilled in the art or in the use of such machines, the destruction or loss of one card will so disturb the accounting or time recording system as to require checking of many records and a duplication of much effort. With our device, where a card is torn or warped so that a portion of it travels sufficiently out of its normal path of travel as to be likely to jam in the machine, such portion of the card will encounter one or more of the arms 60 or 62 and immediately rock the carrier 56 to open contact position as illustrated in Fig. 5, whereupon the source of power is immediately cut off by the breaking of the electric circuit described. We have found that with a machine equipped with our stop device, not more than two cards were jammed, despite the high rate of speed and the momentum of the mechanism, as opposed to the

jamming and destruction of from twenty to thirty or more cards with the manual shut-off heretofore employed.

It will be apparent that our invention is susceptible of modification, and we do not wish to be restricted to the form shown and described except as defined by the claims properly interpreted.

What we claim is:—

1. In combination, mechanism for feeding articles in a desired path including a source of power and spaced pairs of co-acting driven opposed rollers, and stop means including a member located adjacent said path of travel between said pairs of rollers and actuatable by any of said articles having a portion projecting out of said path to discontinue the application of power to said mechanism.

2. In combination, mechanism for feeding articles in a desired path including a source of power and spaced pairs of co-acting rollers actuated thereby, said mechanism having a restricted passage for said articles, and stop means located adjacent said passage between said pairs of rollers and adjacent the path of said articles, said means being actuatable by any of said articles having a portion projecting out of the normal path of travel to discontinue the application of power to said mechanism.

3. In combination, mechanism for feeding articles in a desired path including a source of power and spaced pairs of rollers actuated thereby, an electric circuit controlling said source of power, said circuit including a pair of contacts, and means actuatable by any of said articles having a portion projecting out of said path between said pairs of rollers to separate said contacts and thereby shut off said source of power.

4. In combination, mechanism for feeding articles in a desired path including a source of power, spaced pairs of co-acting rollers actuated thereby, an electric circuit controlling said source of power, said circuit including a pair of contacts, and means actuatable by any of said articles having a portion projecting out of said path to separate said contacts and thereby shut off said source of power, said last named means including a finger having a portion lying adjacent the path of travel of said articles between said pairs of rollers.

5. In combination, article feeding means comprising co-acting electrically actuated pairs of co-acting rolls, spaced members forming a restricted passage for said articles, a stop device including a member lying adjacent the path of travel of said articles between said pairs of rolls and adjacent said restricted passage, an electric circuit including contacts and controlling the actuation of said feeding rolls, said stop member being actuatable by any of said articles having a portion projecting out of the normal path of travel to separate said contacts to discontinue actuation of said rolls.

6. In combination, article feeding mechanism including electrically actuated spaced pairs of co-acting rolls, means providing a throat for the passage of said articles, and means comprising a switching mechanism for classifying said articles, a stop device including a member having a portion adjacent said throat and a member having a portion adjacent said zone, said members being located between said pairs of rolls, an electric circuit for the control of said feeding mechanism and including contacts, said members being actuatable by any articles having a portion projecting out of the normal path of travel to separate said contacts to discontinue the actuation of said feeding mechanism.

7. In combination, mechanism including spaced feed rolls arranged to convey planiform articles and actuating mechanism for said rolls, means including a stop member having an actuable portion located between the planes of said rolls to discontinue the operation of said actuating mechanism, said actuable portion being adjacent but out of the normal path of travel of said articles between said rolls whereby any of said articles having a portion between said rolls projecting out of the normal path of travel will contact said last named means.

In testimony whereof, we have signed our names to this specification.

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