Aug. 12, 1952 W. WOCKENFUSS 2,606,762

FEED MECHANISM FOR TABULATING CARDS

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Fig. 1

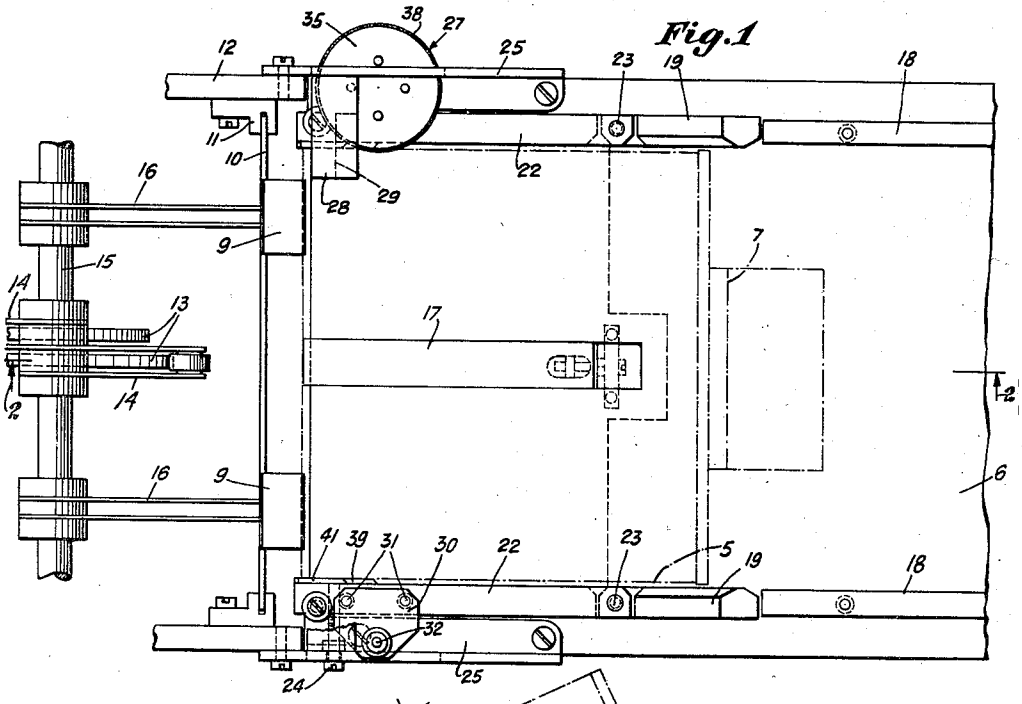


Fig. 2

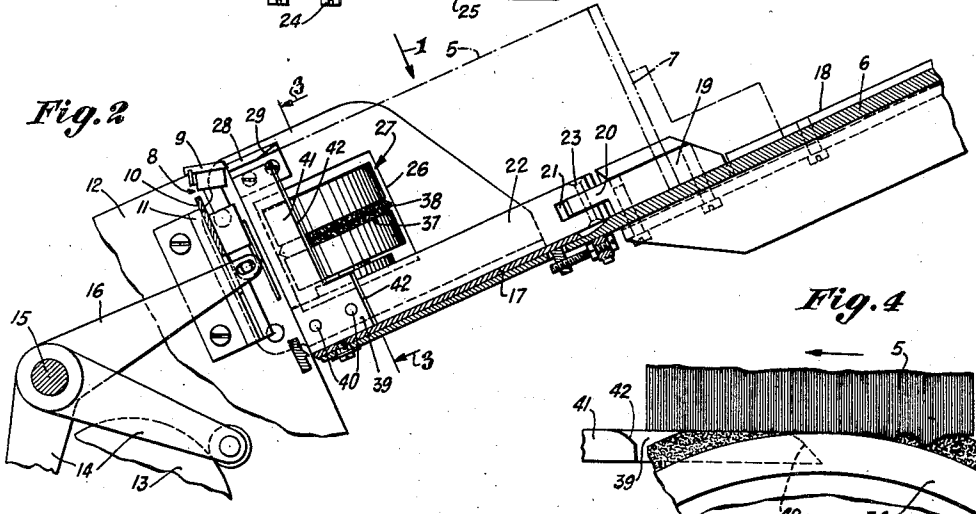
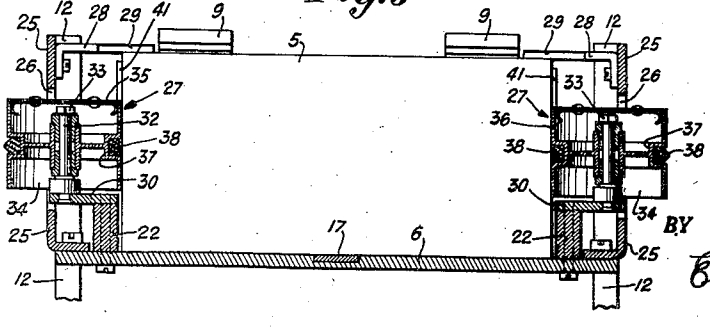


Fig. 4

Fig. 3



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FEED MECHANISM FOR TABULATING CARDS

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7 Claims. (Cl. 271—43)

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This invention relates to improvements in feed mechanisms for tabulating cards and has particular reference to a card aligning means therefor.

In feed devices of the type herein involved, it is well known to employ a picker mechanism to strip cards from a stack and convey them to an analyzing means where the perforations punched in said cards are sensed. When placing a stack of cards in a magazine or chute preliminary to the operation of the feed mechanism, unless extreme care is exercised in the stacking of said cards, the edges of some of the cards will protrude slightly beyond others and if this misalignment is not corrected before the cards are fed from the stack the perforations in the various columns of said cards will not be directly in line with the analyzing elements and there will exist the possibility of complete failure or improper sensing of said perforations. It is, therefore, highly essential, as the cards are stripped by the picker mechanism, that they be properly aligned column-wise with respect to the analyzing elements so as to assure proper sensing of the perforations in the cards.

The above desiratum is attained in the present invention by the provision of an improved aligning means for the cards which will act positively to align the edges thereof in the stack during the movement of the cards toward the feed mechanism therefor.

More specifically, the invention contemplates the positioning of rotatable aligning elements contiguous to opposed walls of a card magazine or chute and so arranged with respect to a stack of cards that any protruding edges of the latter in said stack will be engaged by said aligning elements and moved thereby into direct alignment with each other as the cards approach the feeding mechanism.

The inventive idea involved is capable of receiving a variety of expressions one of which, for purposes of illustration, is shown in the accompanying drawing; but it will be expressly understood that said drawing is employed merely to facilitate the description of the invention as a whole and not to define the limits thereof, reference being had to the appended claims for this purpose.

In the drawing:

Fig. 1 is a fragmentary top plan view of a card feed mechanism constructed in accordance with the invention and with one of the aligning elements removed, the view being taken in the direction of the arrow indicated in Fig. 2;

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Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1;

Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 2; and

Fig. 4 is an enlarged fragmentary end view, partly in section, of one of the aligning elements and an associated guide plate shown in association with a stack of cards and illustrating the manner in which said element acts to align edges of the cards as they pass said element in their movement toward the feed mechanism.

In the preferred form of the invention shown herein, a stack of cards 5, indicated in Figs. 1 and 2 by dot and dash lines, is placed upon the bottom 6 of an inclined chute or magazine and backed by a weighted follower 7, also indicated by dot and dash lines, which acts to force the cards downwardly to present the foremost card in the stack to the picker mechanism generally indicated at 8. Said mechanism is of a known type comprising the picker heads 9 supported for reciprocation by a plate 10 slidable in guides 11 secured to the side members 12 which partially enclose the picker mechanism. Any suitable means may be employed to reciprocate the plate 10 and heads 9 supported thereby, this means being conventionally shown as comprising complementary cams 13 which operate followers 14 carried by a rock shaft 15 on which is also secured the arms 16 each connected to one of the picker heads 9. The usual adjustable throat plate 17 is mounted on the bottom 6 of the chute and permits, upon each operation of the picker mechanism, the stripping of a single card from the stack 5 and through the throat of the chute to the feed rollers (not shown) located below said chute. The rear or upper portion of the chute is completed by the shallow side walls 18 secured to or forming part of the bottom 6 and the space between said walls is slightly greater than the length of the cards 5 so as to facilitate the preliminary stacking of the cards in the chute. The forward end portions 19 of said side walls 18 are of greater height and each portion is provided with a forwardly extending tongue 20 disposed in a recess 21 of a laterally adjustable side rail 22 pivoted at 23 and which forms a continuation of the adjacent side wall 18. A micrometer screw adjustment 24 is provided for each side rail 22 by means of which the latter may be adjusted, along with the aligning elements of the present invention, with respect to the cards to compensate for slight variations in the length of said cards caused by changes in humidity and, also, both

rails 22 may be adjusted in the same direction to similarly shift the aligning elements carried thereby to properly align the columns of the cards with the sensing elements.

At opposite sides of the chute bottom 6 adjacent the forward or delivery end thereof and exteriorly of the side rails 22, said bottom has secured thereto, and to the members 12, the vertically disposed side plates 25 each having an aperture 26 therein for accommodating one of the card aligning elements generally indicated at 27 and presently to be described in detail. Adjacent the upper edges of the plates 25 contiguous to the picker heads 9 and extending inwardly from said plates with their inner ends overlying the upper edges of the cards 5, are the two guide plates 28 having beveled edges 29 which will be contacted by the upper edge of any card which may be projecting from the stack so that said card will be forced downwardly into proper alignment with preceding cards in the stack as the upper edges of the latter engage the undersurfaces of said plates 28 and approach said picker heads, thus insuring proper stripping of the cards from the stack.

Each aligning element 27 is supported by and adjustable with one of the side rails 22 and is freely rotatable thereon, although it is within the scope of the invention that the element may be positively driven by any suitable means. To support said element 27, a mounting plate 30 is secured at 31 (Fig. 1) to the upper edge of the associated rail 22 and carries a spindle 32 whose axis is perpendicular to the direction of movement of the card stack and upon which the element is mounted and secured in position, by a nut 33, for free rotation about said spindle. Each element 27 is in the form of an open ended metal cylinder or roller 34 and has a removable disc cover 35 for its upper end which is frictionally held in position by leaf spirngs 36 carried by the cover. Said cylinder is provided medially of its ends with a circumferential groove 37 in which is seated a yieldable, resilient ring 38 preferably made of sponge rubber and whose outer diameter is slightly greater than that of the cylinder 34 so as to normally project bepond the periphery thereof, and which is readily compressible into the groove 37 by contact with the adjacent end edges of the cards 5 as they approach and pass the cylinder in their movement toward the picker mechanism 8, and said contact will have the effect of freely rotating said cylinder. As seen in Fig. 4, when the cards 5 are unevenly stacked lengthwise, as shown at the right of said figure, the protruding ends thereof on either side of the chute will embed themselves in the ring 38 of the adjacent aligning element prior to contact with the periphery of the cylinder 34. The ring 38 readily yields to the pressure of the cards and, in so doing, effects a gripping action upon the edges thereof which tends to feed the cards forwardly and avoids the possibility of the protruding ends thereof being bent, which might otherwise occur if said ends project unduly and come into direct contact with a hard surface. After the ends of the cards are so engaged by the ring 38, they come into contact with the periphery of the adjacent cylinder 34 and, while still being embedded in the ring 38 before the latter is completely compressed in its groove 37 by pressure of the cards, will be forced inwardly by said contact so that when they reach the center line extending between the two cylinders 34, the card ends will be in perfect alignment as shown at the left of Fig. 4.

To maintain this perfect alignment for the stripping of the cards from the stack, there is introduced between the throat of the chute and each of the cylinders 34, a guide plate 39 which is secured, at 40, to the inner surface of the adjacent side rail 22 so as to be movable therewith and with the cylinder 34 should said rail be adjusted by the screw 24 to compensate for slight differences in the lengths of the cards. Each guide plate 39 has an upper reduced portion 41 and the total height of said plate is substantially equal to the width of the cards. The lower portion of the plate 39 projects rearwardly to approximately the center line extending between the cylinders 34 and the inner surface of the plate is substantially tangential to the periphery of its associated cylinder so that the inner surfaces of both guide plates 39 will coact to maintain the perfect alignment of the cards after they pass said center line between the cylinders. The rear edges of the plates 39, including the upper portions 41 thereof, are beveled and rounded as indicated at 42 so as not to present sharp edges to the cards as they break contact with the cylinders 34 and their rings 38.

What is claimed is:

1. In a card feeding mechanism, a chute having a throat at one end through which cards are fed from a stack therein; means to feed said cards, rotatable elements supported on opposite sides of said chute for peripheral contact with opposed end edges of said cards in said stack as they move toward said throat, and a yieldable member extending about each of said rotatable elements and projecting beyond the periphery thereof for engagement by said card edges.

2. In a card feeding mechanism, a chute having a throat at one end through which cards are fed from a stack therein, means to feed said cards, a rotatable element cooperating with said stack for engagement with adjacent edges of said cards to align said edges in said stack as they approach said throat, and a yieldable member carried by said rotatable element and projecting beyond the periphery thereof for engagement with said card edges preliminary to their contact with said rotatable element.

3. In a card feeding mechanism, a chute having a throat at one end through which cards are fed from a stack therein, means to feed said cards, a rotatable element cooperating with said stack for engagement with edges of said cards to align said edges in said stack as they approach said throat, and a yieldable member extending circumferentially about said rotatable element and slightly beyond the periphery thereof for gripping contact with said card edges.

4. In a card feeding mechanism, a chute having a throat at one end through which cards are fed from a stack therein, means to feed said cards from said stack and through said throat, rotatable elements supported on opposite sides of said chute for peripheral contact with opposed end edges of said cards in said stack, guide plates for said cards disposed between said throat and rotatable elements and having guide surfaces substantially tangential to the peripheries of said elements, and a yieldable member extending circumferentially about each rotatable element and projecting beyond the periphery thereof for gripping contact with card edges prior to contact of the latter with said rotatable elements.

5. In a card feeding mechanism, a chute having

a throat at one end through which cards are fed from a stack in said chute, means to feed said cards from said stack, a revolvable card aligning element supported at one side of said chute for peripheral contact with adjacent end edges of the cards in said stack as they move toward said throat, and means carried by said revolvable element and having gripping contact with said card edges prior to their engagement with said element, said gripping contact being such as to effect revolution of said element in a direction which will urge said cards toward said throat.

6. In a statistical card feeding mechanism wherein a stack of cards are fed so that their columns are maintained in alignment with sensing elements, the combination of a chute having a bottom and a throat at one end thereof toward which the cards move and through which said cards are fed toward said sensing elements, means to feed the cards through said throat, side guide rails pivotally mounted on the bottom of said chute and extending in parallelism toward said throat for contact throughout their lengths by misaligned edges of said cards in said stack, means to adjust said guide rails about their pivots in a plane parallel to said bottom to alter the course of the cards in said stack as they approach said throat thereby to align columns of said cards with said sensing elements as they are fed through said throat, and opposed card aligning rollers carried by said guide rails adjacent their ends remote from the pivots thereof and arranged

for contact by said card edges as the cards pass between said rollers.

7. In a card feeding mechanism, a chute having a card supporting surface and a throat at one end thereof, side guide rails for the cards pivotally mounted on said chute for lateral adjustments relative to said card supporting surface in a plane parallel thereto, means to so adjust said side rails, card aligning rollers carried by said guide rails for adjustment therewith and having opposed surfaces engageable by end edges of said cards at points whose distance apart is determined by adjustment of said side rails, and guide plates for said cards adjustable with said side rails and mounted thereon between said throat and said points of engagement of the cards with said roller surfaces and in tangential relation to the peripheries of said rollers.

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