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[54] **DATA PROCESSING APPARATUS**

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[52] **U.S. Cl.** ..... **194/4 G**, 194/102

[51] **Int. Cl.** **G07f 1/06**

[58] **Field of Search** ..... 194/4, 4 G, 67, 68, 69, 194/97, 99, 102, DIG. 20

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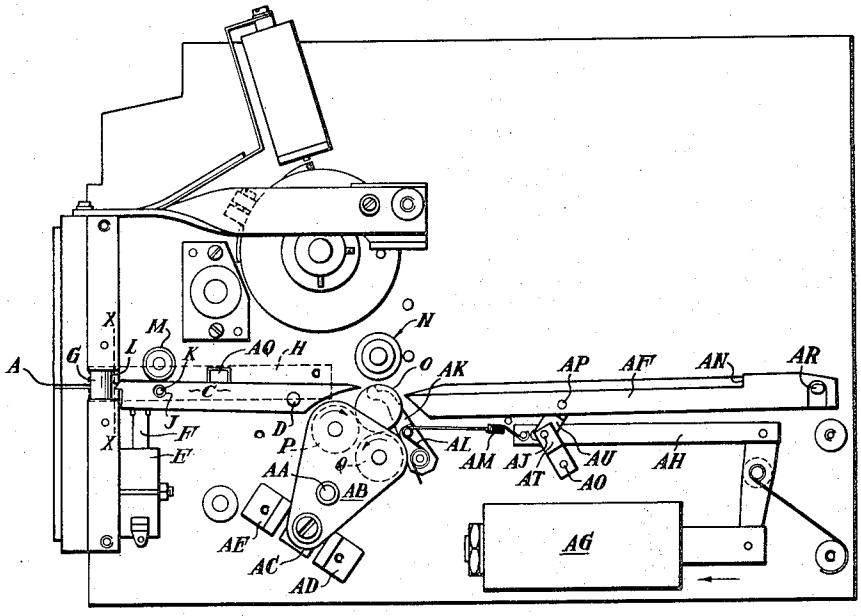
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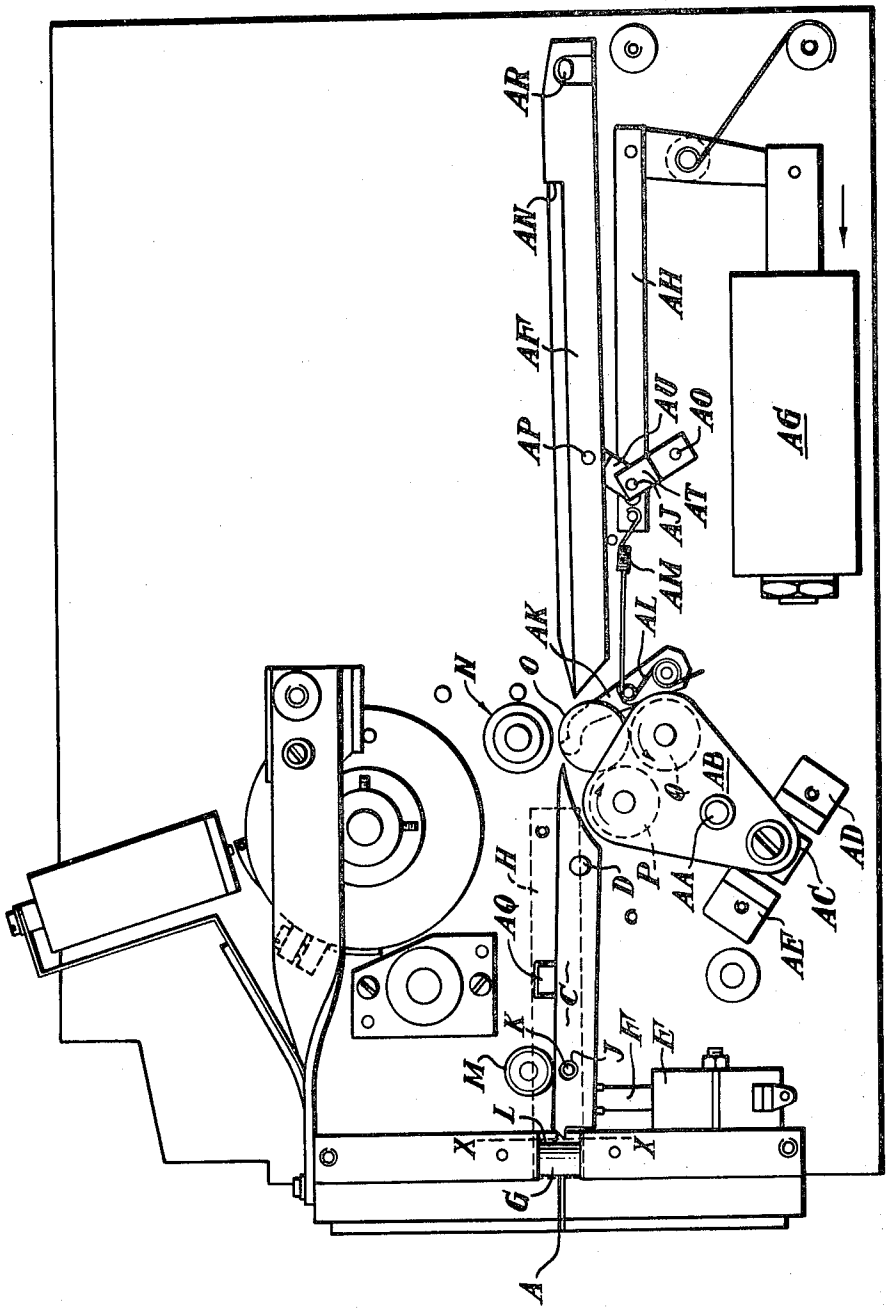
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[57] **ABSTRACT**

The invention relates to apparatus for processing card-carried data, and the object of the invention is to reduce the possibility of an unauthorised card being fed into such apparatus. For this purpose a passage leading from a card entry slot to the data processing means is blocked unless a card of a predetermined minimum width is present in the slot. The passage is normally blocked by a pivotably-mounted tray having a forward edge opposite the card entry slot and being held in this blocking position by two spring members mounted one on either side of the tray. When a card of the required minimum width is inserted in the slot, it separates the two spring members and releases the tray so that it can be pivoted out of the blocking position.

6 Claims, 1 Drawing Figure




AR
AK
AH
AF'
AP
AU
AO
AT
AJ
AM
AL
AK
AG'
N
O
AB
Q
P
D
H
AA
AD
AC
AE
AQ
C
K
M
L
J
F'
E'
X
X
G
A

DATA PROCESSING APPARATUS

This invention relates to apparatus for processing data in or on a card and it is an object of the invention to increase the security of such apparatus by reducing the possibility of an unauthorised card being fed into the apparatus.

The term "card" is used herein to denote any convenient form of token, or the like, which may be carried and inserted in data processing apparatus. Such cards may be used, for example, as requisitioning elements for cash or goods dispensing machines, or as stores or programmes for computers. The data, or some of the data, on the card may be represented by the resonant frequencies of a plurality of passing resonant devices in accordance with United Kingdom Patent Specification No. 1,233,260. Further data may be recorded on a magnetic stripe enclosed within the card in accordance with United Kingdom Patent Specification No. 1,249,061.

From one aspect the invention consists in apparatus for processing data in or on a card, wherein a passage leading from a card entry slot to data processing means is blocked unless a card of a predetermined minimum width is present in said slot.

From another aspect, the invention consists in apparatus for processing data in or on a card, including a card entry slot, blocking means movable from a first position in which it blocks a passage leading from said slot to data processing means to a second position in which said passage is unblocked, spring means urging said blocking means towards said first position, locking means for retaining said blocking means in said first position and release means operative to unlock said locking means when a card of a predetermined minimum width enters said slot.

Preferably, the width of the card entry slot is only slightly greater than said predetermined minimum width so that it defines a predetermined maximum width for the card which does not differ substantially from the predetermined minimum width. Accordingly, in this case, only cards substantially of a particular width can be inserted in the apparatus.

Preferably, the blocking means are constituted by a pivotally mounted tray having a forward edge disposed opposite to said card entry slot and urged by spring means in such a direction that said forward edge normally prevents the entry of a card into the apparatus. Said tray is provided with two laterally projecting pegs capable of entering respective holes in two spring members mounted one on either side of the tray and biassed towards each other so that the pegs are normally engaged in the slots. Each spring member carries at the forward end thereof a roller capable of being engaged by a respective lateral edge of a card as it is inserted through said slot. The rollers and spring members are arranged and located so that, if a card of the predetermined minimum width is inserted through the slot, it will engage both rollers and urge them apart so that the pegs projecting laterally from the tray are disengaged from the holes in the spring members. As a result, the tray is unlocked and capable of being displaced from the first position in which it blocks entry to the apparatus. To enable it to be moved to the second or unblocking position, it is provided with ramps on the forward edge thereof, which ramps can be engaged by the leading edge of the card. As the card is pressed against the ramps, the tray is pivoted to the second position to allow the card to enter the apparatus.

From another aspect the invention consists in any novel features of the embodiment illustrated in the accompanying diagrammatic drawing, taken singly or in combination.

The apparatus illustrated includes a card entry slot A, the height of which is such as to prevent entry of objects thicker than the maximum permitted card thickness. Similarly, the width of the slot is such as to prevent the entry of cards or other objects of a width greater than a predetermined maximum. Two rollers G are carried at the forward ends of respective arms H, one located on each side of the slot. A tracy C, pivoted at D and urged in a clockwise direction by the spring arm F of a microswitch E, normally acts as a barrier to prevent the entry of a card or other object. The tray C is provided with two pins K projecting laterally therefrom and passing through holes J in the springs H. These pins hold the tray locked in the position shown in the drawings in which the passage from the card entry slot is blocked. However, if the card entering the slot is of the predetermined minimum width, it urges the two rollers G apart, thus also moving the spring members H outwardly away from the tray. If the card has the correct width it will, by the time it reaches the line X—X have moved the two spring members H sufficiently far apart to release the tray C. As the card is fed further through the slot A, the leading edge will press against two ramps L, one on either side of the forward edge of the tray C. As a result, the tray C will be rotated in an anticlockwise direction as seen in the drawing, against the action of the spring arm F of the microswitch E. Consequently, the card will be able to travel along the upper surface of the tray and will pass below a roller M. The roller M is fixed in the apparatus and, accordingly, the thickness of the card will maintain the tray C in the anticlockwise position. Thus, the card can be fed further into the apparatus through the slot A and eventually the leading edge will reach the gap between two rollers N and O, the height of this gap being somewhat less than the thickness of the card.

Means (not shown) are provided to rotate two rollers P and Q in opposite directions, as indicated by the arrows. These two rollers are mounted in a frame comprising two yokes AB which are pivotally mounted on two coaxial pins AA. The frame also includes a mild steel armature AC located between two electromagnets AD and AE. Normally, when the apparatus is switched on, the magnet AE is energised so that the frame is rotated in a clockwise direction, as seen in the drawing, and the roller P is then in contact with the roller O. However, when the microswitch E is depressed by the anticlockwise rotation of the tray C, the electromagnet AE is de-energised and the electromagnet AD is energised. Consequently, the frame is rotated in an anticlockwise direction so that the roller Q comes into contact with the roller O in place of the roller P. As a result, the roller O rotates in a clockwise direction and, when the card enters the nip of the rollers N and O, it is carried between the rollers and advanced on to a spring-loaded slide (not shown) carried on a platen AF.

The microswitch E, in addition to controlling the electromagnets AE and AD, also controls an electronic timer which, after a predetermined delay, causes energisation of an electromagnet AG. The delay is suffi-

ciently long to ensure that the electromagnet AG is not energised before the rear edge of the card has passed between the rollers N and O. When the electromagnet AG is energised, the armature moves in the direction indicated on the drawing with the result that a rod AH coupled thereto moves in the opposite direction. This rod is connected through a spring AM to a pivotally-mounted lever AK. This lever is normally biassed in an anticlockwise direction by a spring AL, but is moved in a clockwise direction against the action of this spring by the movement of the rod AH. Accordingly, the upper end of the lever engages the rear edge of the card and forces the forward edge of the slide against a shoulder AN in the platen AF.

The rod AH is provided with a slot through which a pivot pin AJ passes. Pivotally mounted on this pin are two levers AT and AU. The lever AT is pivoted to the frame of the apparatus at AO and the lever AU is pivoted to the platen AF at AP. When the movement of the rod AH commences, it has no effect on the levers AT and AU because the pin AJ slides in the slot in the rod. However, when the pin reaches the end of the slot, further movement of the rod AH causes the pivot AJ to move to the right in the drawing so that the linkage AT/AU tends to assume a straight line position. As a result, the platen AF is moved upwardly away from the pivot AO. This action raises the card until it is pressed against the card reading and/or writing means (not shown).

The platen AF is provided with two slots, one at each side of its forward end, and two fixed pins AR engage in respective ones of these slots. Consequently, longitudinal movement of the platen AF is prevented, but the platen is able to rise to force the card against the card reader or writer. It is to be understood that the spring AM stretches to allow the second part of the action of the electromagnet AG while the lever AK holds the card against the shoulder AM.

At the same time as the electromagnet AG is energised, the magnet A is de-energised and the magnet AE is energised. As a result, the frame holding the two rollers P and Q is rotated in a clockwise direction and the roller P is brought into contact with the roller O in place of the roller Q. Consequently, the direction of rotation of the roller O is reversed.

When the card has been read and possibly also written upon, and all other operations necessitating its retention in the apparatus have been completed, the electromagnet AG is de-energised allowing the platen AF to drop and the lever AK to rotate in an anticlockwise direction. As a result, the sprung slide in the platen is allowed to move the card to the left in the drawing with the result that the rear edge is engaged by the rollers N and O which are now rotating in the direction necessary to move the card to the left. As the card is drawn outwardly, it passes between two rollers AQ carried respectively by the two springs H. These two rollers serve to move the two springs H apart, once again disengaging the pegs K from the holes J in the respective springs. Consequently, the tray C is unlocked, and is moved in an anticlockwise direction when the card passes between the tray and the roller M. Accordingly, the rollers N and O can continue to drive the card outwardly through the slot A, and the dimensions of the apparatus and the card are arranged so that, at this time, it is possible to retrieve the card manually from the slot A. When the card is removed from the apparatus, the tray C again rotates in a clockwise direction under the influence of the spring arm F and the springs H move together to lock the tray in the blocking position, closing off the slot A against entry of any object other than a correct sized card.

The switching arrangements in the apparatus are arranged so that, when the electromagnet AG is energised, the electromagnet AD cannot be energised by the entry of a further card. Accordingly, if a further correct sized card is inserted while there is already a card on the platen AF, it will not be gripped by the rollers N and O. Further, when the first card is ejected at the end of the reading or writing procedure, it will force the second card out from the slot A before emerging itself.

What is claimed is:

1. Apparatus for processing data in and on cards, including a card entry slot, blocking means constituted by a pivotally mounted tray having a forward edge disposed opposite to said card entry slot and urged by spring means in such a direction that said forward edge normally prevents entry of a card into the apparatus, said blocking means being movable from a first position in which it blocks a passage leading from said slot to data processing means to a second position in which said passage is unblocked, spring means urging said blocking means towards said first position, locking means for retaining said blocking means in said first position and release means operative to unlock said locking means when a card of a predetermined minimum width enters said slot.

2. Apparatus as claimed in claim **1,** wherein the width of said card entry slot is only slightly greater than said predetermined minimum width so that it defines a predetermined maximum width for the card which does not differ substantially from said predetermined minimum width.

3. Apparatus as claimed in claim **1,** wherein said tray is provided with two laterally projecting pegs capable of entering respective holes in two spring members mounted one on either side of the tray and biassed towards each other so that the pegs are normally engaged in the slots.

4. Apparatus as claimed in claim **3,** wherein each spring member carries at the forward end thereof a roller capable of being engaged by a respective lateral edge of a card as it is inserted through said slot.

5. Apparatus as claimed in claim **4,** wherein the rollers and spring members are so arranged and located that, if a card of said predetermined minimum width is inserted through said slot, it will engage both rollers and urge them apart so that the pegs projecting laterally from the tray are disengaged from the holes in the spring members, whereby the tray is unlocked and rendered capable of being displaced from said first position in which it blocks entry to the apparatus.

6. Apparatus as claimed in claim **5,** wherein said tray is provided with ramps on the forward edge thereof which ramps are engageable by the leading edge of the card.

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