July 8, 1952 R. HOFGAARD 2,602,451

CARD REGISTER AND THE LIKE

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Fig. 1.

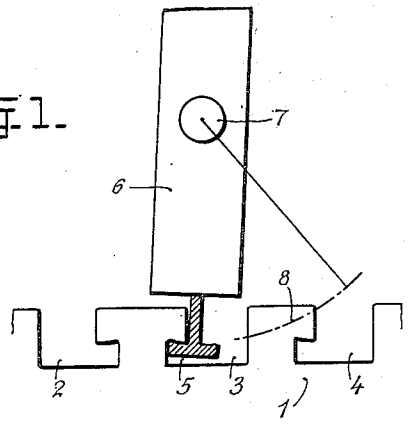


Fig. 2.

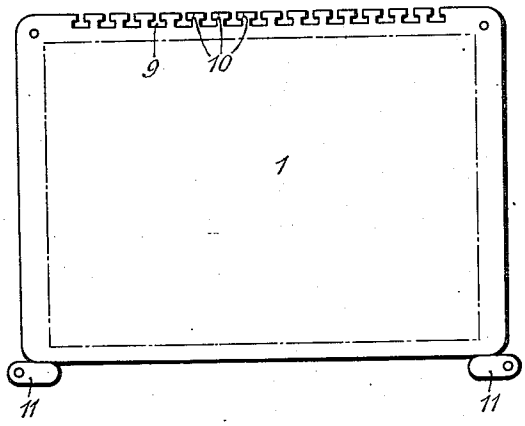
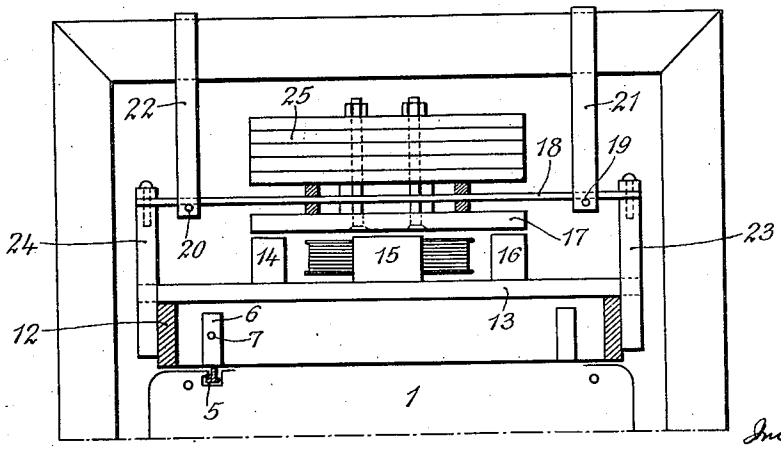


Fig. 3.



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CARD REGISTER AND THE LIKE

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5 Claims. (Cl. 129—16.1)

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The present invention relates to a card register and to a particular form or embodiment of cards for a register of the present type. The card register in accordance with the invention relates to the type of card registers, in which the cards are stored in a suspended position, and the invention in the following description is described in connection with a register of this type although the invention, as it will be apparent from the foregoing, can also be utilised in combination with other types of card registers.

The main object of the invention is to provide a card register with a number of cards suspended on rails or the like, the register being so constructed that any particular card, irrespective, of its place in the register, may be released from the suspending means and be caused to separate from the remaining cards.

This is obtained in accordance with the invention by providing the cards, which may be manufactured from any convenient type of sheet material, such as sheet metal, cardboard covered with metal-foil, plastics, paper or the like, with a number of L-shaped or inversely L-shaped incisions along their upper edge, these incisions being adapted to engage rails having a T-shaped cross-section, the cross beam of which is somewhat shorter than the width of the stem of the L-shaped incisions along the upper edge of the cards.

These rails are adapted to be individually displaced in a direction perpendicular to their respective longitudinal axes in such a manner that they take up the desired one of two different end positions with regard to the cards, in which positions the T-shaped rails either register with the broad stems of the L-shaped incisions in the cards, or engage the horizontal part of the L-shaped incisions.

For each individual card the incisions along the upper edge are arranged in a particular sequence, so that for each individual card one particular position of the suspending rails will bring this individual card out of engagement with all the rails. The individual adjustment of the suspending rails may be carried out electrically or magnetically in accordance with a code system, comprising for each individual card a series of impulses causing a movement of a number of rails from one position to another.

As example, if each card be provided along its upper edge with 8 L-shaped or inversely L-shaped incisions this gives 2^8 i. e. 256 different combinations, in other words the card register in that case may comprise 256 individually releasable cards. With 16 incisions and 16 rails one has the possibility of 2^{16}, or 65,536 combinations, and a corresponding number of cards in the card register.

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Besides the suspension and releasing arrangement for the cards mentioned above, the invention also comprises arrangements, by means of which an individual card which has been released from the rails owing to a particular adjustment of the same, is caused to slide downward between the other cards irrespective of the friction between the cards.

These arrangements operate in such a manner that, when a card is to be released i. e. when the rails have been brought in the position corresponding to the release of a particular card, the means in question expose the rails to vibrations which are transferred from the rails to the cards, causing the card which is not in engagement with any rail, to slide downward by gravity.

The said vibration device for the suspension rails may be of any suitable kind, such as electrical, pneumatic, or purely mechanical means, but in the present embodiment the invention will be described in connection with an electro-magnetic vibration device.

The preferred embodiment of the invention will now be described with reference to the accompanying drawing, in which

Figure 1 is a diagrammatical view on an enlarged scale of a part of the upper edge of a card in connection with a suspension rail.

Figure 2 illustrates on a reduced scale a standard card which has not as yet been provided with an individual series of L-shaped incisions, all incisions being in that case in the form of inverted T's, and

Figure 3 is a diagrammatical sectional view through the upper part of the card register, comprising the upper part of a card, on 2 suspension rails and the vibration device.

The principle for the suspension and release of the cards is first described with reference to Figure 1 of the drawings.

1 is a register card which is provided along its upper edge with L-shaped incisions, which are indicated with the numerals 2, 3 and 4. The number of incisions in the upper edge of each card, as will be understood from what has been said hereinbefore, is determined by the number of cards in the card register.

As will be seen in the drawing the incision 2 is in the form of an L—whereas incisions 3 and 4 are in the form of inverted L's.

Each incision is adapted to be engaged by a

suspension rail in the form of an inverted T, the horizontal part 5 of which, in the position illustrated in connection with incision 3, supports the card when the incision with which it is in engagement corresponds to the form of an inverted L. As mentioned above one suspension rail is provided for each incision in the card but only one rail is illustrated in the drawing in order to avoid complicating the same unnecessarily.

The suspension rails 5 are carried by arms 6 which are pivotally supported by shafts 7 for angular movement about axes located vertically above the center lines of the horizontal legs of the incisions through which the respective suspension rails extend. As illustrated in Fig. 1, the rail 5 is displaced to the left to withdraw support from a coded card having an L-shaped incision in line with the inverted L-shaped incision 3 of the illustrated card. To release a card having the coded incisions as shown in Fig. 1, the T-shaped rail in incision 2 must be shifted to the left and the rails in incisions 3 and 4 must be shifted to the right. There is only one particular combination of the positions of all suspension rails in which a card is released from supporting engagement with all rails. As the sequence of L-shaped and inversely L-shaped incisions is different for each card, it also follows that when the suspension rails are in a position in which one individual card is completely released, all the rest of the cards will be in supporting engagement with one or more rails.

In order to prevent wear of the card material owing to the movement of the suspension rails the part of the incisions adapted to engage the suspension rails as well as the corresponding part of the latter are curved along a circular path 8, the centre of which lies on the axis 7 about which the carrying arms 6 of the suspension rails pivot.

In Figure 2 is illustrated a standard card on a reduced scale before the card has been provided with an individual series of L-shaped and inversely L-shaped incisions.

The card 1, it will be noted, is provided with a number of inverted T-shaped incisions 9, and the individual preparation of each card is carried out by removing the projecting part of the T-shaped projections separating the inverted T-shaped incisions 9 at one or the other side of each incision as indicated by the dotted lines 10.

In order to avoid that a card, which during the release of another card is in supporting engagement with only one or a few rails at one side of the card, gets out of alignment with the rest of the cards, supplementary supporting rails 11 may be placed along the under side of the cards, such supporting rails 11 being adapted to be brought out of engagement with the cards during the release of one card, and to be brought back in their supporting position when the card in question has been released, whereby all cards are brought back to their exact original position.

In Figure 3 is diagrammatically illustrated the upper part of the card register, comprising the upper part of the card, one suspension rail and the vibration device for the rails.

The card is indicated at 1, the supporting rails at 5 and the pivoted arms carrying the rails, at 6. In order to avoid unnecessarily complicating the drawing there is only shown one incision in combination with one suspension rail 5 and one carrying arm 6. The carrying arms 6 are secured to shafts 7 mounted in a rectangular frame 12.

The pivoting movement of arms 6 and the corresponding movements of suspension rails 5 may for instance be caused by means of electro-magnetic relays cooperating with armatures secured to shaft 7 in order to move arm 6 from one position to the other in accordance with the combination of current impulses supplied to the electro-magnetic relays.

This arrangement is not illustrated in the drawing, and will not be further described in detail, as it may be of any suitable known type, and has no direct connection with the principle forming the basis of the present invention.

Secured to frame 12 there is arranged a cross beam or plate 13 carrying one or more electro-magnets, the cores of which are indicated with 14, 15, 16. Immediately above the system of electro-magnets 14, 15, 16 is mounted an armature 17 to an elastic beam or plate 18. This beam or plate 18 is supported near each end on pins 19, 20 carried by supporting rods 21, 22, and at its extreme ends outside the supporting points 19, 20, is connected by means of the supporting rods 23, 24 with the frame 12 and thereby also with the member 13 and the magnetic system 14, 15, 16.

When an alternating current of a certain frequency is supplied to the electro-magnetic system 14, 15, 16, the latter will attract armature 17 with a corresponding frequency and will thereby cause the whole system comprising the frame 12, magnetic system, armature and the elastic part 18 to vibrate. In order that this vibration is not transferred to exterior parts of the device, the elastic part 18 is provided with a load 25 balancing the weight of the frame 12 with the magnetic system and suspension rails.

The vibrations in the vertical direction to which the suspension rails 5 are exposed in this manner, are transmitted to all cards, supported by the rails, whereby the cards are also caused to vibrate with high frequency and low amplitude. These vibrations of the cards have the effect that an individual card which has been released from supporting engagement with all the rails, slide downward by gravity between the neighbouring cards irrespective of friction between the card surfaces, and the cards released in this manner may then be taken by a transport belt or the like in order to be conveyed to the place, where it is to be utilised.

When a released card has been utilised for instance for providing the same with perforations, typing, or the like, it is conveyed automatically or otherwise back to the card register and is there pushed on to the supporting rails at the free ends of the latter.

The means for conveying the cards from the card register and back to the register may be of any suitable kind, and have no bearing upon the present invention.

In the form of the invention herein described, it has been supposed that the cards are suspended from suspension rails and are separated from the rest of the cards by gravitation, assisted by vibrating movements when released from the rails. The principle of the connection between the cards and the T-shaped rails and their release from the latter does, however, not necessarily presume that the cards be suspended from the rails or that they are removed by gravitation although this is the preferred embodiment.

I claim:

1. A register for coded cards which at their upper edge are provided with a plurality of in-

cisions, certain of said incisions being L-shaped or inversely L-shaped according to a selected code, said register comprising a frame, a plurality of rails of inverted T-shape in transverse cross-section, the width of the cross-bar portion of each T-shaped rail being less than the width of the stem of an incision of a card, and shafts supporting each of said rails on said frame for individual angular movement between end positions in which the cross-bar portion of the rail is in vertical alinement with the stem of the associated incision of any given card or alternatively one side of the cross-bar extends into the horizontal leg of the incision of that card, the axes of said shafts being located vertically above the center lines of the incisions through which the respective rails extend; whereby a card of selected coding may be released from said rails by angular movement of the respective rails to position the cross-bar portions thereof in vertical alinement with the stems of the associated incisions.

2. A register for coded cards as recited in claim 1, wherein the card-supporting surfaces of each rail are cylindrical with a center of curvature coinciding with the pivotal axis of angular movement of the rail.

3. A register for coded cards as recited in claim 1, in combination with a rigid supporting structure, means resiliently mounting said frame on said supporting structure, and means for vibrating said frame to facilitate the separation by gravity of a code-released card from the assembly of cards suspended on said rails.

4. A register for coded cards as recited in claim 1, wherein the forward ends of said rails are free and unobstructed, whereby coded cards may be pushed upon said rails for support thereby.

5. A register for coded cards as recited in claim 1, in combination with supplemental supporting rails pivotally mounted on said frame and extending along the lower edges of a series of cards suspended on said rails of inverted T-shape; said supplemental supporting rails being movable between an operative position underlying the series of cards to an inoperative position permitting dropping of a code-selected card released from said rails of inverted T-shape.

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