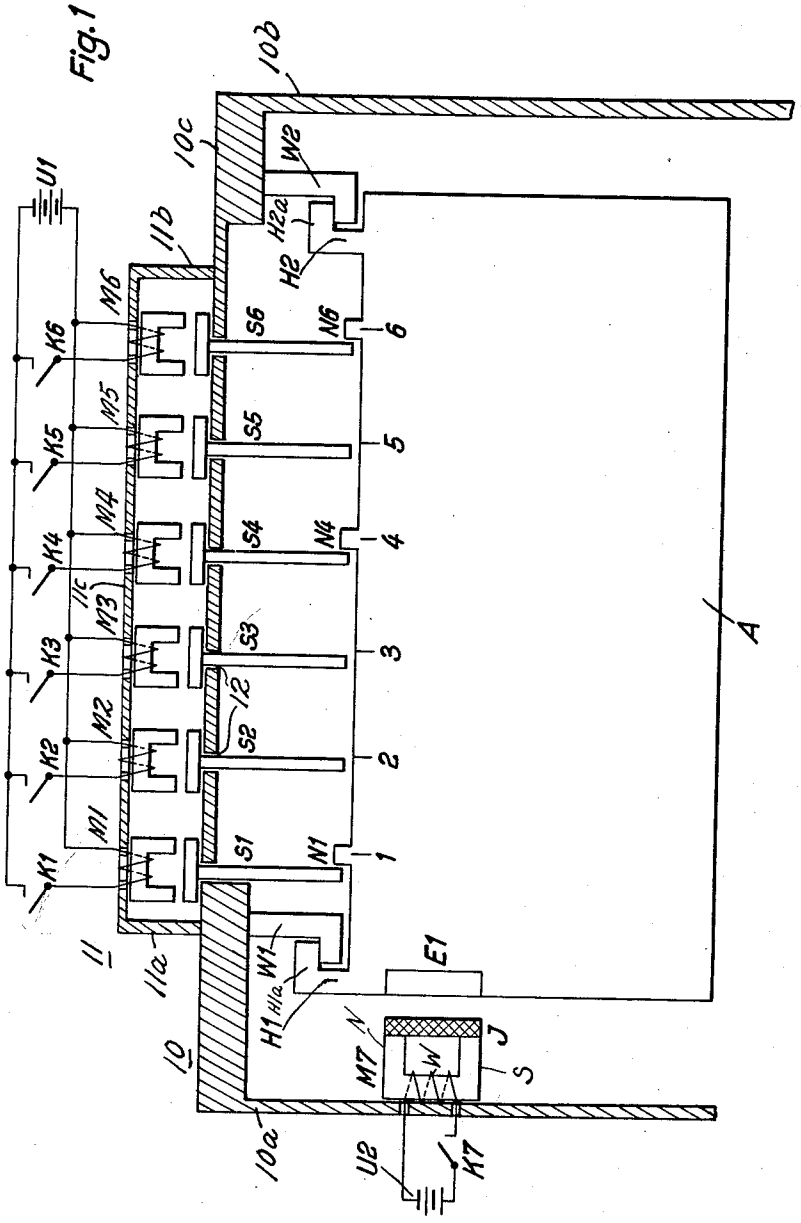
Jan. 15, 1963 F. MITTAG 3,073,313

FILE RECORD SELECTION ARRANGEMENT

Filed Dec. 19, 1956 3 Sheets-Sheet 1

Fig. 1



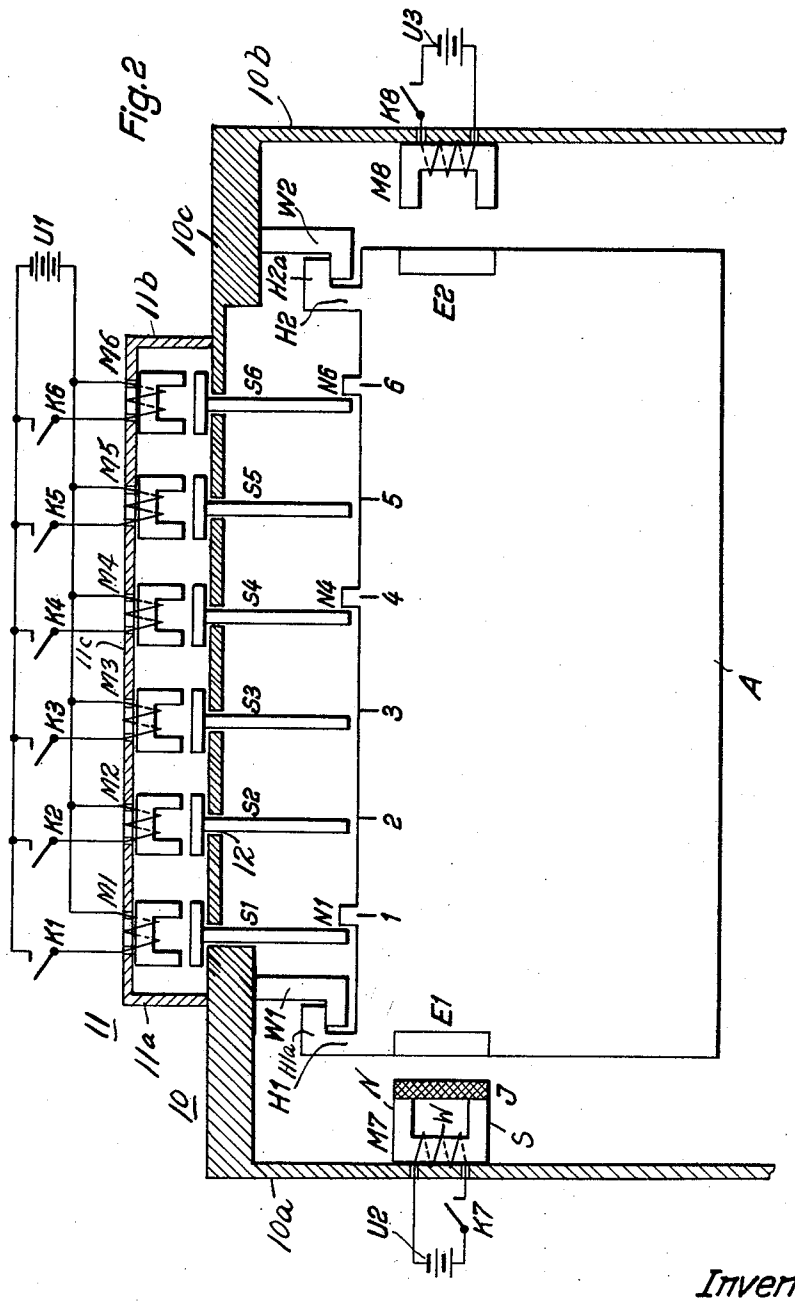
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FILE RECORD SELECTION ARRANGEMENT

Filed Dec. 19, 1956 3 Sheets-Sheet 2

Fig. 2



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FILE RECORD SELECTION ARRANGEMENT

Filed Dec. 19, 1956 3 Sheets-Sheet 3

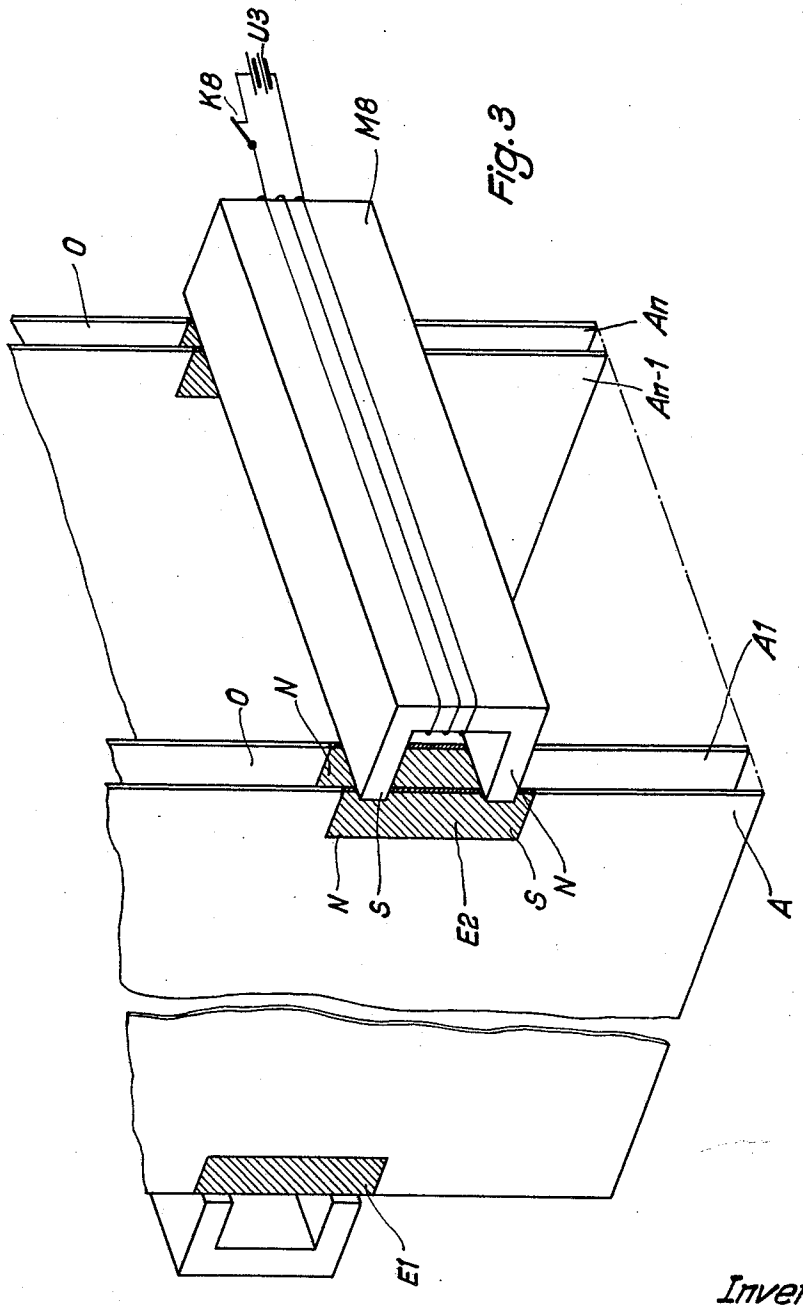


Fig. 3

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FILE RECORD SELECTION ARRANGEMENT

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Claims priority, application Germany Jan. 19, 1956
1 Claim. (Cl. 129—16.1)

This invention relates to improvements in record selection and more particularly to a system for selecting particular records from a file of a plurality of similar records.

This invention is useful in card indices or registers wherein a particular card can be removed by means of a remote selection system independent of its position in the file. This invention is particularly useful in the type of card index wherein the cards may be stored in random fashion without regard to the usual consecutive numbering or lettering which is required in usual card index systems.

There are known arrangements for extracting a desired card from a file of same, but the cards are generally subject to wear and tear so that they must be replaced by new cards. It has been previously suggested that file cards be suspended from a combination of bars which engage slots in the upper edge of the cards. The disengagement of the cards from the bars may be accomplished by mechanical or electromagnetic means. Such a system results in a considerable friction between the cards and the bars and between contiguous cards.

It has previously been proposed that the cards be fitted with metallic tabs and suspended from magnetic bars that extend transversely of the cards. By de-energizing predetermined of the bars, a predetermined card will become detached and fall out of the file. The disadvantage of this arrangement lies in the fact that the magnetic bars must be energized by their excitation coils as long as the cards are held in position. A further disadvantage in this system lies in the fact that a predetermined card which is to be extracted may become wedged between contiguous cards and therefore fail to drop out of the file. It takes relatively slight frictional contact between contiguous cards to overcome the relatively slight gravitational pull on a released card due to the fact that the weight of a card is negligible. Thus in such a system the entire file must be agitated so that a released card will not be wedged in position by the friction of its neighbors.

The invention overcomes the shortcomings of the prior art in providing an improved method of suspending the file cards in a file by limiting the frictional surface which cooperates with the suspension bars.

The invention further overcomes a shortcoming of the prior art in providing a method for automatically separating the cards in the file to avoid the wedging of a released card by contiguous cards.

Accordingly it is an object of the invention to provide an improved system for suspending cards with a minimum of friction.

It is a further object of the invention to provide an improved system for suspending cards and for reducing the frictional engagement between contiguous cards.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood, by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a schematic partly in section drawing of a first embodiment of my invention and shows a card suspended in the file;

FIG. 2 is a modification of my invention and includes the structure of FIG. 1 plus the additional structure for automatically separating contiguous cards one from the other; and

FIG. 3 is an isometric view of a portion of the structure which separates contiguous cards.

Referring now to FIG. 1 there is shown a card file wherein there is provided a pair of spaced, parallel, angle-shaped support bars W1, W2 extending transversely of the entire file of cards A. Each of the file cards A comprises a card having a pair of upwardly extending portions H1, H2 at the opposite ends of the upper edge of the card, with horizontal portions H1*a*, H2*a*, attached thereto, the last-mentioned portions extending in the same direction and being complementarily disposed with respect to the bars W1, W2. Thus it will be seen that the horizontal portions H1*a*, H2*a* will rest on the corresponding short leg of the L of the bars W1, W2 as shown in FIG. 1.

In order to extract a card from the file, a card A must be moved toward the left so that the portions H1*a*, H2*a*, are released from the L-shaped bars W1, W2. To effect this required lateral movement, there is provided an electromagnet M7 mounted on the inside surface of the left side 10*a* of the frame 10, and having a pair of pole faces N, S extending toward the cards A but spaced therefrom. These pole faces extend transversely of the left edges of all the cards in the file. Each of the cards is provided with a ferromagnetic portion E1 which may be applied to the card in any desired manner and which portion acts as the armature to the electromagnet M7. When the electromagnet M7 is energized by the closure of key contact K7, a potential from the source U2 is applied to the winding W and causes each of the cards A to tend to move laterally toward the left and toward the electromagnet M7. Electromagnet M7 is provided with a diamagnetic covering J over its respective pole faces to prevent the armature E1 of a removed card from adhering to said pole faces due to remanent magnetization, etc.

To ensure the extraction of but a single card A from the file upon the energization of the electromagnet M7, there is further provided a plurality of tabs N1, N4, N6 which project from the top edge of the cards as shown in FIG. 1. It should be understood that each card in the file is provided with a different permutation of tabs, the spacing following a known coding arrangement. Tabs other than those illustrated would be positioned above the vertical lines 2, 3 or 5 as required, similar to those shown above the numerals 1, 4 and 6. Thus in FIG. 1 the card A is shown with three tabs constituting a ⅜ code permutation arrangement and it will be understood that a greater or smaller number of tabs may be used giving a different permutation depending on the size of the file.

Cooperating with each of the tab positions which have been labelled 1 . . . 6 on the card, there are provided a plurality of movable blocking elements S1 . . . S6 extending through apertures 12 in the portion 10*c* of the frame. The blocking elements are normally in their lowered position as shown and are adapted to be retracted upward by means of their cooperating electromagnets M1 . . . M6 respectively. The electromagnets M1 . . . M6 are attached to the inside surface of the portion 11*c* of the bracket 11 by any suitable fastening means. The blocking elements S1 . . . S6 extend transversely across all the cards in the file. The electromagnets M1 . . . M6 are adapted to be selectively energized from source U1 by means of the switch keys K1 . . . K6, respectively. The closure of keys K1, K4 and K6 will cause the blocking elements S1, S4 and S6 to be retracted upwardly and out of the path of the tabs N1, N4, N6. Upon the energization of electromagnet M7 a card A as shown, may be drawn toward the left a sufficient distance so that the

portions H1*a*, H2*a* of the card will become disengaged from the bars W1, W2 and will drop, due to the pull of gravity, out of the file. Since the card containing the tabs above-mentioned is the only one in the file, having the particular coding of the tabs shown, the remainder of the cards will be prevented from moving laterally under the urging of electromagnet M7 due to the unactuated blocking elements S2, S3 and S5 any one of which will lie in the path of a tab at positions 2, 3 or 5 of the other cards A. The blocking elements S1 . . . S6 must be able to move upwardly a distance sufficient to clear the tops of the tabs N1 . . . N6.

It will be seen thus far that a particular card may be extracted from the file despite its position therein. The means for inserting the cards into the file are not disclosed but may be any mechanical means which will raise the cards to a point above the level of the L-shaped angle bars W1, W2 and deposit the cards A so that the portions H1*a*, H2*a* rest on the suspension bars W1, W2. Each card added to the file may be applied at the end since it has already been stated that no particular positioning of the cards is required in the file.

The structure for overcoming the lateral friction exerted upon a selected card by its contiguous cards in the file will now be explained with the aid of FIG. 2. As shown in FIG. 2, the card A is provided with an additional ferro-magnetic portion E2 applied to the edge of the card which is opposite the portion E1. Cooperating with the entire file of cards and extending transversely there-across, there is provided a second electromagnet M8 mounted to the inside of the right side 10*b* of the frame 10 and which is similar to the electromagnet M7 with the exception that it is not required to be magnetically shielded by a diamagnetic covering. By reason of the limitation of lateral movement afforded by the complementary positioning of the portions H1*a*, H2*a* with the bars W1, W2, it is manifestly impossible for a card to abut against the pole faces of the electromagnet M8. Electromagnet M8 is energized by the battery U3 upon completion of a circuit through its energizing winding under control of contact K8.

Referring to FIG. 3 there is shown an isometric view of the electromagnet M8 and the manner in which it cooperates with the cards A . . . A*n*. It will be understood that when the electromagnet M8 is energized, the armature portions E2 become similarly magnetically energized and therefore each armature portion tends to become repelled from its neighboring armature portions. Thus in FIG. 3, cards A and A1 tend to separate from each other as do cards A*n*–1 and A*n*. Returning to FIG. 2, if after the separation of the cards is completed the contact K8 is opened and the electromagnet M8 is de-energized and if the contact K7 is closed, the requisite card A will tend to be drawn to the left depending upon the position of the blocking elements S1 . . . S6, as hereinbefore explained.

By proportioning the electromagnets M7 and M8 so that the electromagnet M7 exerts the greater influence, simultaneous closure of the keys K7 and K8 would cause the movement of the proper card A out of the file.

It should be understood that the key contacts K1 . . . K6 could be controlled by a key board (not shown) and the same key board could be made to control the operation of key contacts K7 and K8 which latter contacts could be made to close with every combination of contacts K1 . . . K6. It should also be understood that upon the dropping out of a card from the file, the card could be transferred by a suitable conveyor system (not shown) to the user's location. Such a conveying arrangement is no part of this invention and therefore is not further described herein.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claim.

What is claimed is:

Record selecting apparatus comprising a frame and a pair of spaced parallel suspension rails mounted thereon, a plurality of record cards each having a pair of suspension tabs thereon for engaging respective ones of said rails to suspend the cards in substantially planar parallelism, each of said record cards having a plurality of projections thereon spaced apart in accordance with a predetermined permuted combination peculiar to each record card, a plurality of spaced selectively movable blocking elements common to all record cards and mounted on said frame, each of said blocking elements having a separate electromagnetic means mounted on said frame for moving the associated blocking element from an unoperated position in blocking relationship with said record card projections to an operated position out of blocking relationship with said card projections, separate ferromagnetic means secured to each of said record cards, an electromagnet common to all said cards and mounted on said frame in magnetic relationship with all of said ferromagnetic means, means for energizing desired ones of said electromagnetic means in permuted combination to move the associated blocking elements to their said operated position, and means for energizing the said electromagnet to urge the ferromagnetic means of all of said records towards said electromagnet, the record cards having their projections spaced in a permuted combination different than the permuted combination of operated blocking elements are precluded from lateral movement by the said unoperated elements engaging the said projections while the record cards having their projections spaced in the same permuted combination as the permuted combination of the operated blocking elements are laterally moved towards said electromagnet and disengage the tabs thereon from said suspension rails, the last said record card thereupon falling freely from the record selecting apparatus by its own weight.

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