March 1, 1938. R. R. M. DESAUBLIAUX 2,109,820

CARD SELECTING SYSTEM

Filed Feb. 15, 1936 2 Sheets-Sheet 1

Fig. 1

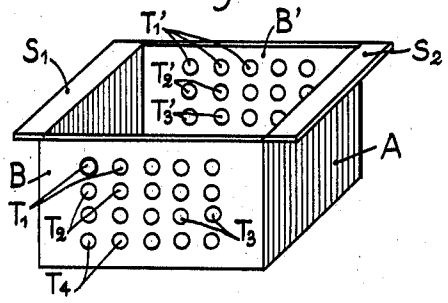


Fig. 2

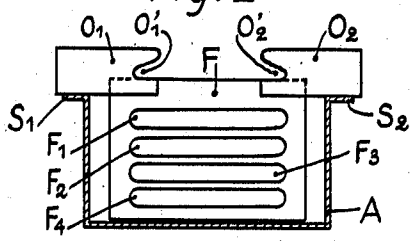


Fig. 3

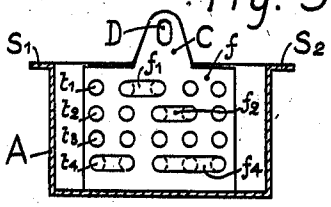


Fig. 4

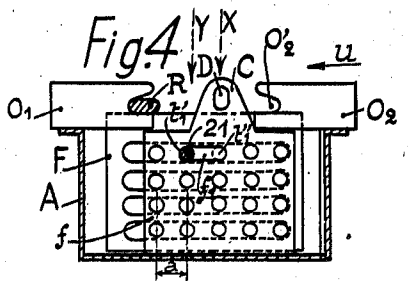


Fig. 5

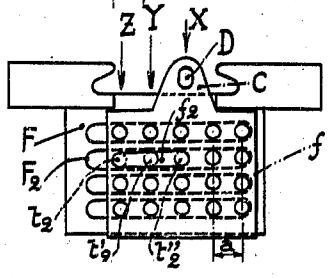
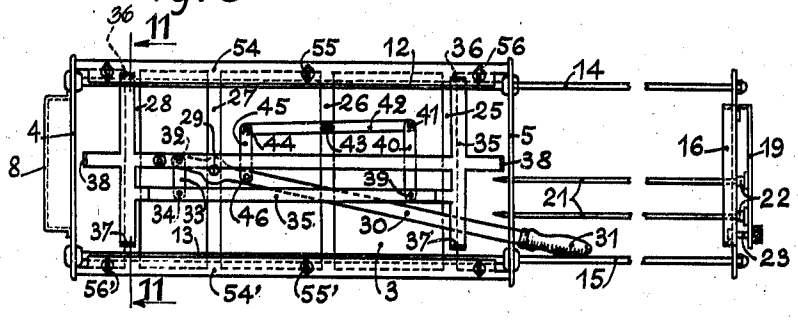


Fig. 6



Inventor: ROBERT ROGER MAURICE DESAUBLIAUX
by C. A. Snow & Co.
Attorneys.

March 1, 1938. R. R. M. DESAUBLIAUX 2,109,820

CARD SELECTING SYSTEM

Filed Feb. 15, 1936 2 Sheets-Sheet 2

Fig. 7

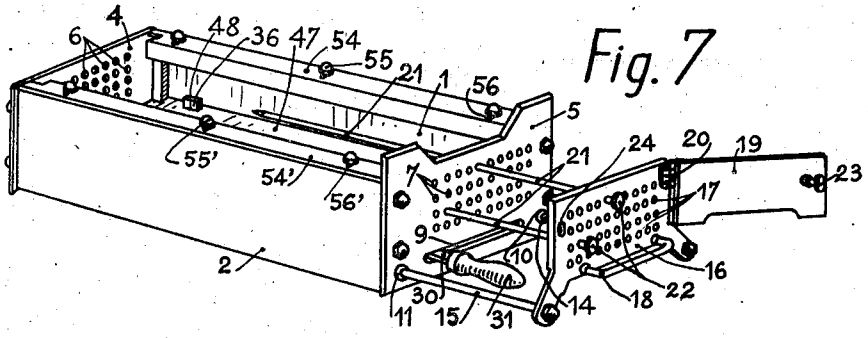


Fig. 8

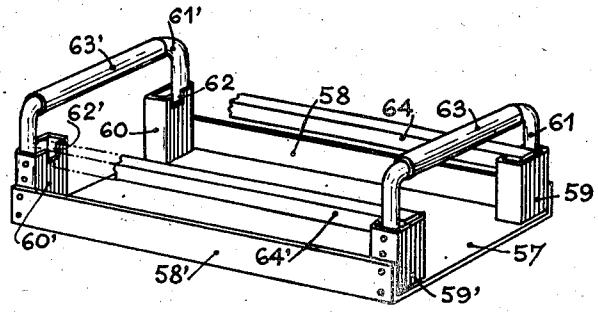


Fig. 9

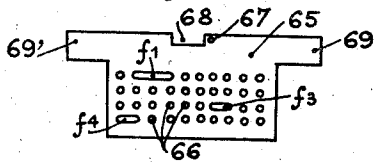


Fig. 10

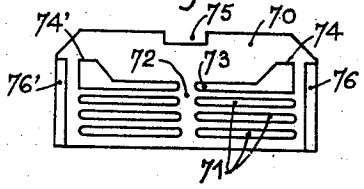
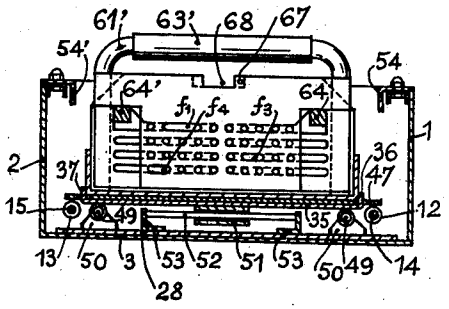


Fig. 11



Inventor: ROBERT, ROGER, MAURICE DESAUBLIAUX
by C. A. Snow & Co.
Attorneys.

Patented Mar. 1, 1938 2,109,820

UNITED STATES PATENT OFFICE

2,109,820

CARD SELECTING SYSTEM

Robert Roger Maurice Desaubliaux, Paris, France

Application February 15, 1936, Serial No. 64,157
In Luxemberg February 16, 1935

7 Claims. (Cl. 129—16.1)

There exist apparatus for the selection of perforated cards in which all the cards, which are similarly perforated with a certain number of holes, disposed along perpendicular lines and corresponding each to a characteristic, bear vertically upon the bottom of a case or are supported by the lateral walls of such a case the cross section of which is substantially equal to the surface of the cards and the front and rear walls of which are provided with holes having each a coding number and positioned in such manner as to register with the holes of the perforated cards disposed vertically in said case. Two corresponding holes of the front and rear faces of the case, respectively may be used as supports for a rod which extends through all the corresponding respective holes of the cards. Two adjacent holes of a card disposed on the same vertical line may be connected together by an aperture or slot of a width at least equal to the diameter of a hole, this aperture or slot corresponding to a predetermined characteristic. Of course, each card may be provided with several of these apertures or slots, corresponding to several characteristics. The selection of all the cards having in common one or several characteristics is effected in the following manner: One or several rods are inserted in the hole or holes corresponding to this characteristic or these characteristics, and the case is then turned upside down. All the cards corresponding to the characteristic or characteristics in question drop a distance corresponding to the apertures provided in the cards. The cards thus separated from the others may be immobilized in this position by means of a supplementary rod. Then the case is brought back into its original position.

This system of selection which makes use of the weight of the cards and involves the turning of the case upside down has the following drawbacks:

On the one hand, the step of turning the case upside down is rather difficult in view of the weight of the system, the capacity of which is thus necessarily limited.

On the other hand, the weight of each card is not always sufficient for causing the card or cards to be selected to slide downwardly, and some of the cards may remain jammed in position due to adhesion with the adjacent cards.

The object of the present invention is to provide a system which obviates these drawbacks, and more especially a system which does not involve the turning of the case upside down.

For this purpose, according to an essential feature of the present invention, the cards to be selected are moved laterally with respect to the cards that are not selected, the case remaining in its normal position with respect to a horizontal plane.

According to a more specific feature of the invention, the apparatus includes, on the one hand, a card case provided with at least two lateral walls and arranged in combination with two stationary plates disposed on the front and on the rear thereof respectively, said stationary plates being provided with holes for the passage of the selecting rods, said holes being positioned opposite one another along at least one transverse alignment, and, on the other hand, selection cards of a width smaller than that of the card case and provided with holes corresponding, in size and position, to those of the front and rear stationary plates. This apparatus is characterized in that the selection cards, which are intended to be provided with slots or apertures as above described extending in the transverse (horizontal) direction between at least two consecutive holes of the card, are combined with driving means for moving laterally (horizontally) the cards to be selected, the card case remaining always in the normal position with respect to a horizontal plane.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

Preferred embodiments of the present invention will be hereinafter described, with reference to the accompanying drawings, given merely by way of example, and in which:

Fig. 1 is a perspective view of a card case for use with the system according to the present invention;

Fig. 2 is a transverse section made in the plane of the surface of one of the driving elements which serve to move the selection cards transversely according to the invention;

Fig. 3 is a transverse section made in the plane of the surface of one of the selection cards;

Fig. 4 is a transverse section of the apparatus illustrating an example of selection;

Fig. 5 is a diagrammatical view illustrating an example of multiple selection;

Fig. 6 is a plan view of another embodiment, the rod carrier being in its fully expanded position;

Fig. 7 is a perspective view of the apparatus of Fig. 6, the rod carrier being in a position of intermediate expansion;

Fig. 8 is a perspective view of the card case of the apparatus of Figs. 6 and 7;

Figs. 9 and 10 show a selection card and a driving card, respectively;

Fig. 11 is a sectional view of the apparatus on the line 11—11 of Fig. 6.

Fig. 1 is a perspective view of a rectangular card case A provided, at its upper part, with two plane slideways S_1 and S_2, and, at the front and rear, respectively, with walls B and B', which constitute the stationary plates above mentioned. These stationary plates are each provided with several rows of holes T_1, T_2, T_3, T_4, and T'_1, T'_2, T'_3, T'_4, respectively, said holes being disposed opposite one another, in the respective plates B and B' and corresponding each to a determined characteristic. In this card case A are disposed driving cards F (Fig. 2) of a width smaller than the width of the case, and each of which is provided, at its upper part, with lugs O_1, O_2, provided with notches O'_1, O'_2 which permit of moving them with a lateral translatory motion in the plane of the card. In the course of this movement, cards F are supported by their lugs O_1, O_2, which slide on slideways S_1, S_2. The vertical edges of the cards come to butt against either the right hand side wall or the left hand side wall of the card case. Lugs O_1 and O_2 are slightly thicker than the remainder of the card. The driving card further includes horizontal apertures or slots F_1, F_2, F_3, F_4, disposed at the same height as the rows of holes $T_1 \ldots T_4$, $T'_1 \ldots T'_4$, respectively, of walls B, B'. Therefore, if a rod is driven through two corresponding holes of these walls B, B', said rod extends through the corresponding slots of the driving cards F present in the card case, and permits of freely moving said driving cards laterally between the lateral vertical walls of the case.

Between two consecutive driving cards F, there is provided (Fig. 3) a selection card *f*, which, in the embodiment shown, bears, through its lower edge, upon the bottom of the case. Each selection card is provided with rows of holes t_1, t_2, t_3, t_4 positioned in such manner as to register with the holes $T_1 \ldots T_4$ and $T'_1 \ldots T'_4$ of walls B and B' of the card case. There is an important interval left between each selection card and the lateral walls of the case. Furthermore, each selection card is provided, at its upper part, with a prolonged portion C provided with a hole D.

Each selection card is adapted to be provided with one or several horizontal slots f_1—f_2 or f_4, for instance, extending between two or more holes of a given row and corresponding to as many selections according to different characteristics.

As above explained, I dispose, alternately, in the card case, a selection card *f* and a driving card F. Each selection card is thus enclosed between two driving cards and it will be readily understood that any displacement of the driving cards in one direction will produce a displacement of the selection cards in the same direction. Therefore, if, prior to carrying out a selection operation, all the upper holes D of the selection cards were disposed along the same line, and one or several rods 21 are driven through the holes corresponding to the characteristics upon which the selection is to be made, all the cards *f* corresponding to these characteristics (or this characteristic) shall be provided with horizontal slots extending from the holes corresponding to this characteristic or these characteristics, either toward the right or toward the left, according to the nature, either positive, or negative, of the selection that is to be carried out. Any simultaneous displacement of the driving cards (produced for instance by acting on notches O'_1 or O'_2 provided in their lugs by means of a bar R) in the direction corresponding to the selection that is to be carried out shall produce, by adhesion, the drive of the selection cards provided with horizontal slots corresponding to this characteristic of selection. This is due to the fact that the presence of said horizontal slots permits the transverse displacement of these particular cards while the other cards are prevented from moving due to the presence of the selection rods engaged in holes of the cards permitting no substantial transverse displacements thereof. This translatory movement of the cards is limited by the fact that the ends of the horizontal slots thereof butt against the corresponding rod or rods. The selected cards are thus in alinement either on the right or on the left of the other cards and it is possible after removing rods 21 and R to extract them from the card case by inserting a rod through all their upper holes D and lifting this last mentioned rod.

As lugs O_1 and O_2 are thicker than the remainder of the corresponding cards, they serve to ensure the contact between these cards while preventing any jamming of the selection cards. The importance of these increased thicknesses must be suitably determined for this purpose. The interval between the two lugs O_1 and O_2 of each driving card is sufficient for permitting the prolonged part C of a selection card to extend therebetween and to move transversely between said lugs for the selection operations. When the selected cards are removed, each of them, due to the fact that its upper edge comes into contact with the lower edge of the lugs O_1, O_2 of the corresponding driving card, simultaneously produces the extraction of said corresponding driving card.

Fig. 4 diagrammatically illustrates an example of selection according to a single characteristic of a card *f* provided with a horizontal slot f_1 extending between holes t'_1, t''_1. Initially, all the selection cards have their holes D located in a common vertical plane X. A rod 21 is driven through the holes registering with hole t'_1, which corresponds to the characteristic that is considered. All the driving cards, and especially card F are moved in the direction of arrow *u*. Card *f* which is driven by adhesion by the two driving cards located adjacent thereto, itself moves in the direction of arrow *u*, until the end t''_1 of the slot f_1 comes to abut against the selection rod. The hole D of card *f* is now located in vertical plane Y and can be extracted from the card case.

As matter of fact, the displacement of the selection cards is not limited to the distance *a* between two consecutive holes of a horizontal row.

Fig. 5 diagrammatically shows an example of the selection of a card *f* provided with a horizontal slot f_2 which extends over a length corresponding to three consecutive holes t_2, t'_2 and t''_2. Therefore the card can be moved through a distance equal to twice the distance *a* between two consecutive holes. Therefore, in this case, the selection card *f* is located, after its horizontal displacement in a position such that its hole D is located in plane Z, the same being true of all the cards which include the same characteristic, while the cards including a horizontal slot permitting a displacement equal to distance *a* shall have their holes D located all in a vertical

plane Y. As for the cards that are not selected they shall remain in a position in which all their holes D are located in a vertical plane X. The arrangement according to the invention therefore permits a multiple-stage selection which is of course not limited to the examples above described, the characteristics being represented by horizontal slots the length of which is a multiple of distance *a*. Of course, the maximum length of a slot is the distance between the end holes of a horizontal row of holes.

On the other hand, it is possible to simultaneously effect a selection concerning several characteristics which are wholly different from one another, that is to say to select cards including several horizontal slots disposed either on the same row and extending between two different holes, or on two different rows. In this case, several rods are driven through the holes corresponding to the characteristics that are considered and the selection is made in a manner analogous to that above described.

Of course, the distance between consecutive holes may vary either for two different systems of selection or even for two different rows of a given system. The selecting rods may be wholly independent of the system, being inserted into the device only when the selection is to be carried out. Alternately, the selecting rods may be mounted in a sliding manner permanently in a fixed part of the apparatus, so that they may be brought either into a position in which they have no contact whatever with the cards or in a position in which they extend through all the cards present in the card case. Finally, the manner of supporting the cards in the case and the means for producing the displacement of the driving cards are in no way limited to the example above described.

In the embodiment of the invention shown by Figs. 6, 7 and 11, the card case includes two lateral walls 1, 2 rigid with a bottom 3, a rear wall 4 and a front wall 5, these two last mentioned walls constituting the stationary plates provided with holes 6 and 7, suitably disposed, opposite one another, respectively. The part of rear wall 4 which carries holes 6 is covered by a flat plate 8. The front wall 5 is provided with a lower middle slot 9 and two lateral holes 10, 11 to which correspond, in the rear wall 4, two similar holes not visible in the drawings. Holes 10 and 11 are connected to the corresponding holes by tubes 12 and 13, respectively, in which tubes cylindrical rods 14 and 15 are slidably mounted respectively. This arrangement is visible in Figs. 6 and 7. Rods 14 and 15 are rigid with the rod carrier 16. This rod carrier is provided with holes 17, disposed in register with holes 6 and 7 of the front and rear walls 4 and 5 of the case. Rod carrier 16 further includes an operating handle 18 and, on the other hand a cover plate 19, hinged at 20 to part 16 so that it can either be moved away from said part 16 (Fig. 7) so as to permit the insertion of a certain number of selecting rods 21 (two in the example illustrated) into registering holes 17 and 7, or be swung back into contact with the heads 22 of these rods. In this last mentioned position plate 19 is locked by the engagement of a part 23 into a hole 24 of the rod carrier 16. It is clear that, in this case, illustrated by Fig. 6, rods 21 can be either nearly wholly extracted from the selecting case, or driven into said case, by acting on handle 18, until the points of these rods, after passing through holes 6 of rear wall 4, butt against end plate 8.

Upon the bottom 3 of the selecting case, there are provided four cross members 25, 26, 27, 28 one of which, 27, carries the pivot 29 of an oscillating lever 30 which extends through the horizontal slot 9 of wall 5 and is provided, at its outer end, with a handle 31. This operating lever 30 is connected to a support 35 intended to receive the inner card case in the following manner. At the rear part of said support, a connecting rod 33 is pivoted at 32 to the operating lever 30 and at 34 to said support 35. At the front part of said support, a connecting rod 45 is pivoted at 46 to lever 30 and at 44 to the end of a lever 42 itself pivoted about a spindle 43 carried by cross member 26. The opposite end of said lever 42 is pivotally connected at 41 to a connecting rod 40 adapted to oscillate about a spindle 39 carried by support 35.

Support 35 carries two groups of lateral stops 36, 37 and a group of end stops 38 intended to receive and to maintain the inner card support. In the example shown (Figs. 7 and 11) a protecting plate 47, provided with holes 48 for the passage of the stops, covers support 35. This support 35 bears, at its rear part (Fig. 11) on two rollers 49, mounted on ball bearings and carried by brackets 50 rigid with cross member 26, and, at its front part, on two other rollers not visible in the drawings and carried in a similar manner by cross member 25. Support 35 is further guided at its rear part by a sliding member 51 cooperating with a guiding rod 52 carried by brackets 53 rigid with cross member 28. The outer case further includes two angle irons 54, 54' carried by the upper parts of the respective lateral walls 1 and 2 of said case to which they are fixed by bolts 55, 55' which extend through openings 56, 56', of elongated shape transversely to said irons so as to permit of adjusting the distance between angle irons 54 and 54'.

The card case proper, or inner case (Figs. 8 and 11) consists of a metal sheet bent upwardly on the lateral sides thereof so as to form the bottom 57 and the longitudinal lateral walls of said cases 58 and 58'. This last mentioned case is strengthened at each corner by tubes 59, 59', 60, 60'. The two front tubes 59 and 59' are braced by a bent member 61, carrying a handle 63, said member 61 being fixed to said tubes, for instance by welding. A similar arrangement is provided for the rear tubes 60 and 60', which are interconnected by a member 61' carrying a handle 63'. At the end of each of these tubes, there is provided a notch such as 62, 62', supporting the ends of small bars 64, 64' intended to support the selection and driving cards. As above explained, the dimensions of the card case thus formed are such that it may rest on protecting plate 47, carried by the outer case, between stops 36, 37 and 38 of support 35. Any oscillatory movement of operating lever 30 about point 29 imparts to said support a translatory movement.

The selection cards 65 (Fig. 9) of a width smaller than that of the card case (Fig. 11) are provided with holes 66 which register with the holes 6 and 7 of the walls. Two holes of the same horizontal row of a card may be connected, when the card is used, by a horizontal slot, for instance f_1, f_2, f_3, f_4. Each card is provided, on the one hand at its upper part, with a hole 67 and a notch 68, and, on the other hand, with two lateral lugs 69, 69' serving to support the card on bars 64, 64'. The size and position of notch 68 are such that the perforations 67 of the cards that are selected, for instance as a consequence of a lateral dis-

placement of the cards to a distance equal to the interval between two consecutive holes are all located in line with notch 68. Under these conditions, it is possible to pass a rod through the upper perforations of all the selected cards so as to permit of simultaneously lifting them. Of course, this notch permits in a likewise manner of lifting the selected cards having undergone a displacement corresponding to several divisions.

The driving cards 70 (Fig. 10), which are of a width substantially equal to that of the card case proper, are provided with horizontal slots 71 disposed in such manner that they register with the rows of holes of the selection cards. However, a median band is reserved in the card at 72, so as to improve the rigidity of the driving cards and also to prevent the corner of a selection card from penetrating into one of the slots of the adjacent driving card. The upper slot 73 of each driving card is enlarged at both ends at 74 and 74', so as to permit of supporting the cards by means of small bars 64, 64'. The driving cards are also provided, at their upper ends, with notches 75 intended to permit the insertion of a rod in the perforations 67 of the selected cards with a view to permitting their extraction from the case. Finally, each driving card is provided, on either of its faces with a lateral part of increased thickness 76, 76'.

The card selecting device which has just been described is worked in the following manner:

The driving cards 70 being all mounted on small bars 64, 64' of the card case, each selection card 65 is disposed in such manner that it is surrounded by two driving cards and rests through its lugs 69, 69' on said bars. Of course, the selection cards corresponding to one classification may fill several card cases.

When some person desires to select the cards of a case which correspond to a certain characteristic, he first brings the rod carrier 16, unprovided with rods, into contact with the front wall 5 of the outer case. Then he places the card case proper upon its support inside the outer case and moves operating lever 30 successively toward the right and toward the left. This is intended to initially bring the selection cards into line since the lugs of these cards have their end edges successively brought into contact with the inner face of sectional irons 54' and 54. Then, after opening locking device 23, cover plate 19 is turned away from the carrier, for instance into the position shown by Fig. 7. The selecting rods are then inserted according to the desired selection or selections to be obtained. Plate 19 is then brought back into the closed position, in which it is locked and operating handle 31 is moved fully to the right, so as to produce the translation of the card case toward the left. In the course of this movement, the cards to be selected, that is to say those which have slots through which extend selecting rods, said slots extending in the direction corresponding to this movement, are actuated by the card case and the driving cards which move together with said case, while the cards that are not to be selected are kept in position by the selecting rods. The selected cards are thus moved toward the left hand side and it is possible to simultaneously remove the whole of them in the manner above described.

If it is desired to select the cards of another card case, it suffices to pull the handle 18 of the rod-carrier 16 in such manner as to wholly extract the rods from the card case and then to replace the case in which the selection has already been effected by a new case. After this, the cards are brought into line, the rod carrier 16 is pushed right back and the operations above described are repeated.

Of course, the structure of the cases, the manner of supporting the driving cards and the selection cards therein, the diameter of the holes provided in the cards and the distance between said holes may vary without departing from the principle of the present invention.

In a general way, while I have, in the above description, disclosed what I deem to be practical and efficient embodiments of the present invention, it should be well understood that I do not wish to be limited thereto as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the accompanying claims.

What I claim is:

1. A selecting system which comprises, in combination, a plurality of cards, each provided with a plurality of holes located in corresponding respective positions in all the cards, at least two holes located on a line parallel to a predetermined direction being connected by a slot in at least two of said cards, an outer case, including two lateral walls at a distance from each other greater than the width of said cards and a front and a rear plate connected to said walls and each provided with holes of the same size and relative position as those of the cards, respectively, a selecting case movable in said outer case transversely to said lateral walls, said selecting case being adapted to support said cards with a possible sliding displacement thereof in the transverse direction in which said selecting case itself is movable in the outer case, said direction coinciding with the direction of the slots provided in cards supported in said selecting case, a plurality of rectilinear rods adapted to engage in corresponding holes of said front and rear plates so as to extend through all of the holes of the respective cards that occupy a same position, driving cards arranged in such manner that each of the first mentioned cards is interposed between two of said driving cards and in frictional engagement therewith, said driving cards being each provided with slots, for the passage of said rods, extending in said predetermined direction, said driving cards being removably supported by said selecting case, means for fixing said driving cards with respect to said selecting case at least in the transverse direction thereof, and guides carried by said lateral walls of the outer case for cooperation with said first mentioned cards so as to permit of bringing their respective corresponding holes into line.

2. An apparatus according to claim 1 in which said first mentioned cards include each two lugs at the upper part thereof and on opposite sides thereof respectively and said driving cards are provided with two holes on opposite sides respectively of the middle line of each of them, further including bars carried by said card case parallelly to said lateral walls, said bars being adapted to slidably support said lugs and to engage in said last mentioned holes of the driving cards, respectively.

3. A system according to claim 1 further including means for moving said card case inside said outer case in either direction transversely to the lateral walls thereof.

4. A system according to claim 1 further including a rod carrier, provided with a plurality of holes of the same size and relative positions as those of said plates and said first mentioned cards, slidable with respect to said outer case in a direction parallel to said rods, and means for removably fixing said rods with respect to said rod carrier.

5. A system according to claim 1 in which each of said driving cards includes a part, which is not engaged between two of the first mentioned cards, of a thickness sufficient for limiting the frictional engagement of all the cards with respect to one another in such manner as to avoid jamming.

6. A system according to claim 1 in which the upper part of each of the first mentioned cards is provided with a hole of the same size and respective position for all of said first mentioned cards, whereby all the selected cards can be removed simultaneously.

7. A selecting system which comprises, in combination, a plurality of cards, each provided with a plurality of holes located in corresponding respective positions in all the cards, at least two holes located on a line parallel to a predetermined direction being connected by a slot in at least two of said cards, guiding means for placing all these cards one behind the other in predetermined relative position, a case for said cards including two lateral walls at a distance from each other greater than the width of said cards and a front and a rear plate connected to said walls and extending in the same direction as said cards, said plates being each provided with holes of the same size and relative position as those of said cards, a plurality of rectilinear rods extending transversely to the surface of each card, adapted to engage each in the holes of the respective cards and of said plates that occupy a given position on the surface thereof, whereby only the cards provided with such slots as are engageable with said rods can move transversely to said rods in said predetermined direction, driving cards arranged in such manner that each of the first mentioned cards is interposed between two of said driving cards, said driving cards being each provided with slots for the passage of said rods extending in said predetermined direction, and said driving cards frictionally engaging all of the first mentioned cards for exerting thereon an action tending to displace them transversely to said rods in said predetermined direction, lugs at the upper part of said driving cards extending on opposite sides thereof respectively adapted to rest on the upper edges of said walls for supporting said driving cards, and means for simultaneously displacing all of these driving cards in said predetermined direction transversely to said rods.

ROBERT ROGER MAURICE DESAUBLIAUX.