

United States Patent

[11] 3,616,902

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|------|-----------|---|
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| [22] | Filed | May 16, 1969 |
| [45] | Patented | Nov. 2, 1971 |
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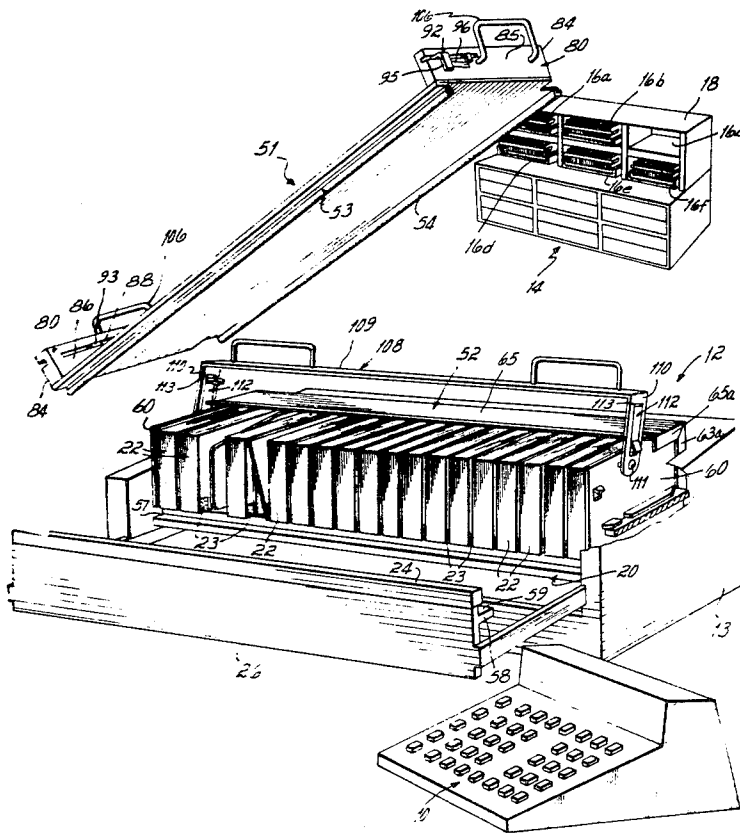
- [54] CARD STORAGE TRANSFER AND POSITIONING
DEVICE FOR USE IN CONJUNCTION WITH CARD
RETRIEVAL APPARATUS
12 Claims, 13 Drawing Figs.**

- [52] U.S. Cl..... 209/80.5
[51] Int. Cl..... B07c 1/20
[50] Field of Search..... 209/80.5,
110.5, 111.8; 214/152; 271/62 B; 53/255

[56] **References Cited**
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ABSTRACT: An accessory device for increasing the effective card storage capacity of retrieval systems in which edge-notched coded cards are randomly stored in face-to-face upstanding relation on a platen in a card selector apparatus. The accessory device includes a two-piece card tray having a substantially planar bottom panel against which the code-notched edges of the cards rest when stored face-to-face in a vertical disposition, and a retaining structure at least partially surrounding the upstanding cards. The retaining structure is positionable between engaged and disengaged positions relative to the bottom panel, thereby facilitating transfer of the cards between the tray and the selector. The retaining structure, when engaged with the bottom panel, cooperates therewith to store the cards in the tray. Alternatively, and when the retaining structure is in the course of being positioned between its engaged and disengaged positions relative to the panel, the retaining structure functions to transfer the cards between a position of support on the bottom panel and a position of support in the card selector.



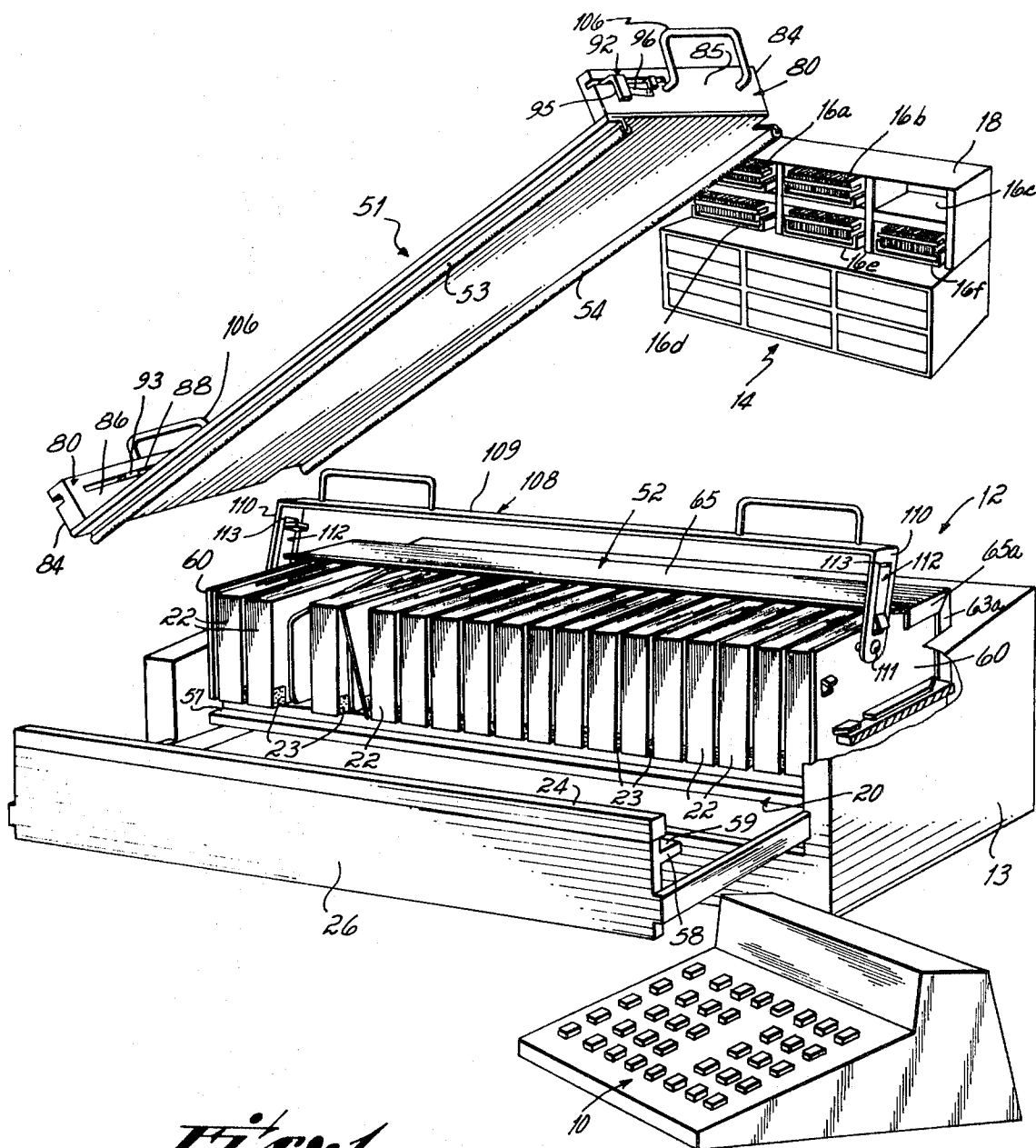
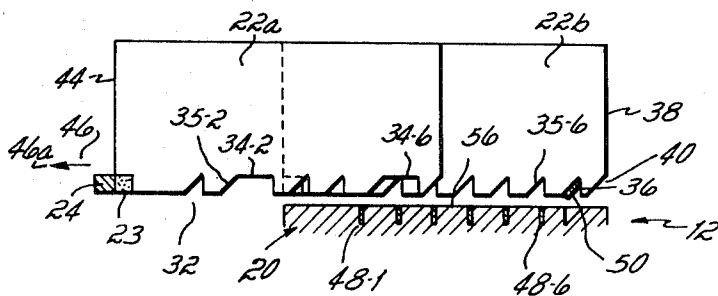
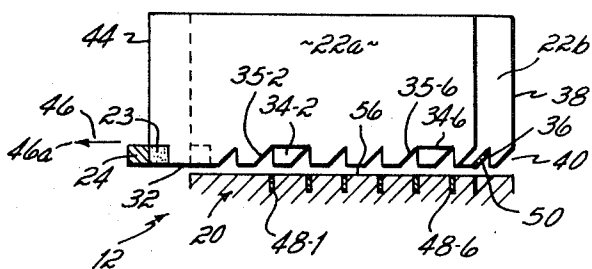
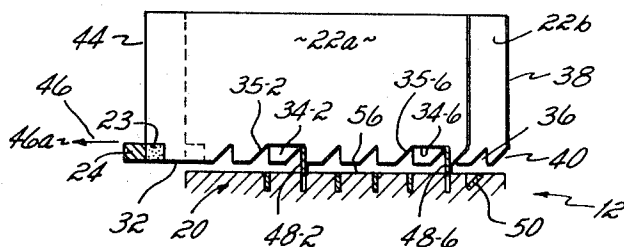
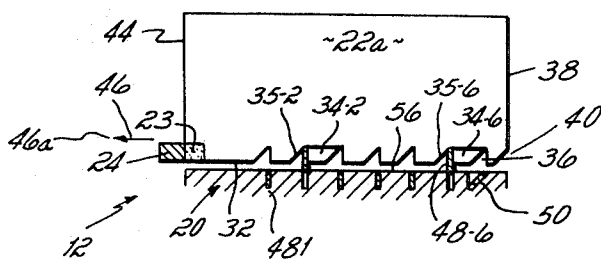
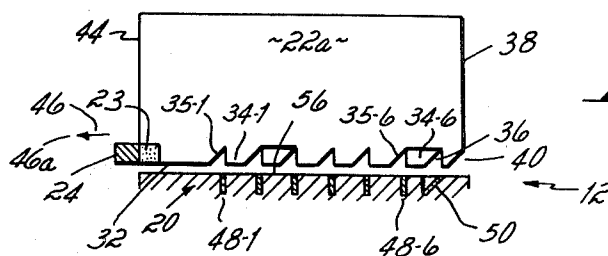


Fig. 1

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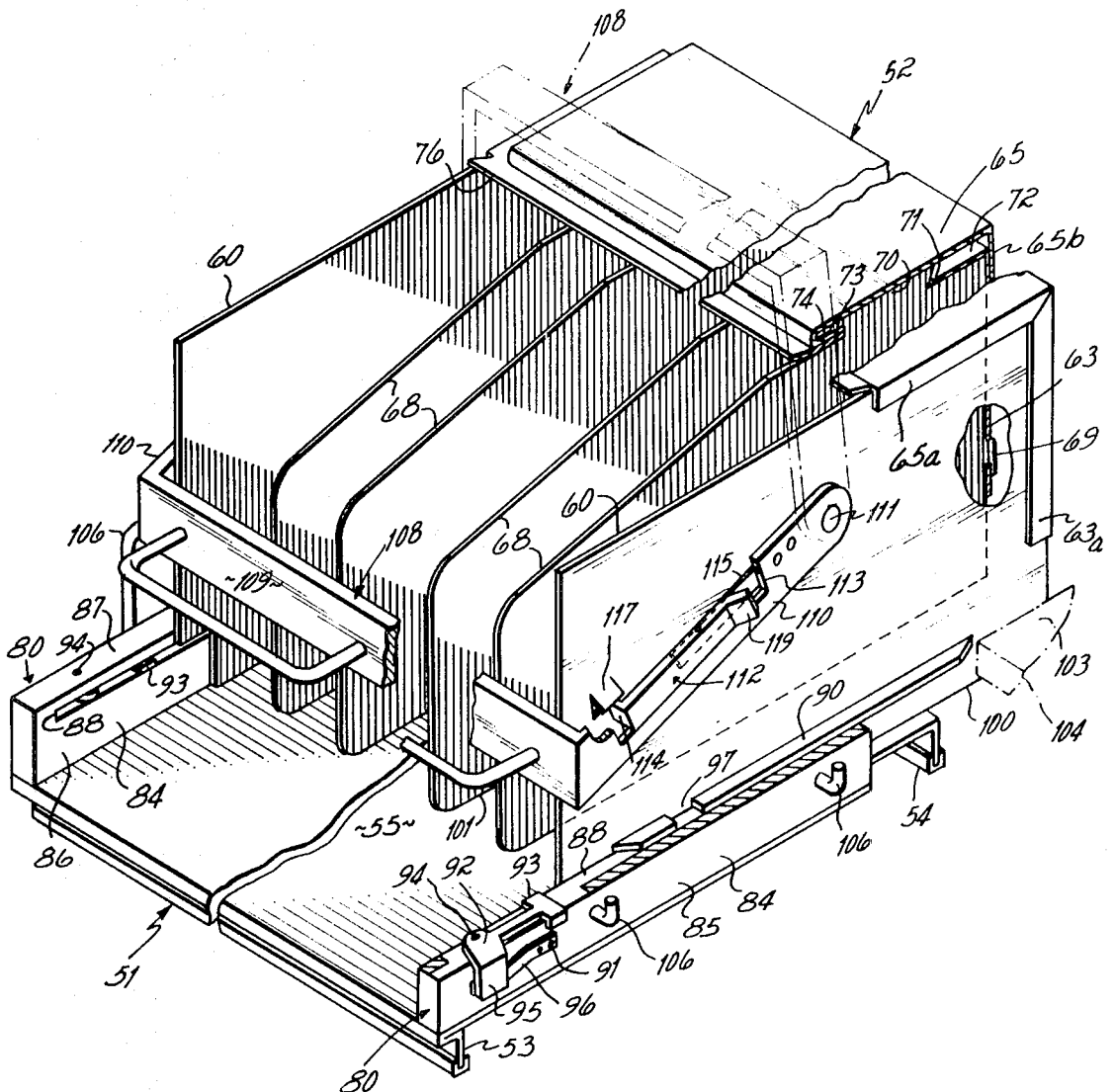
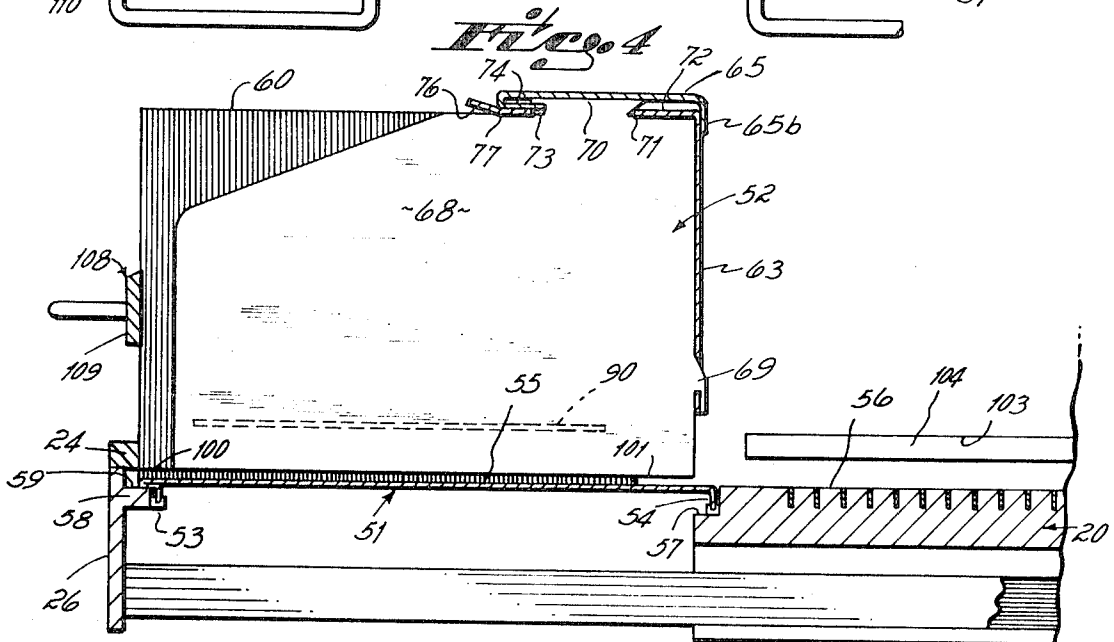
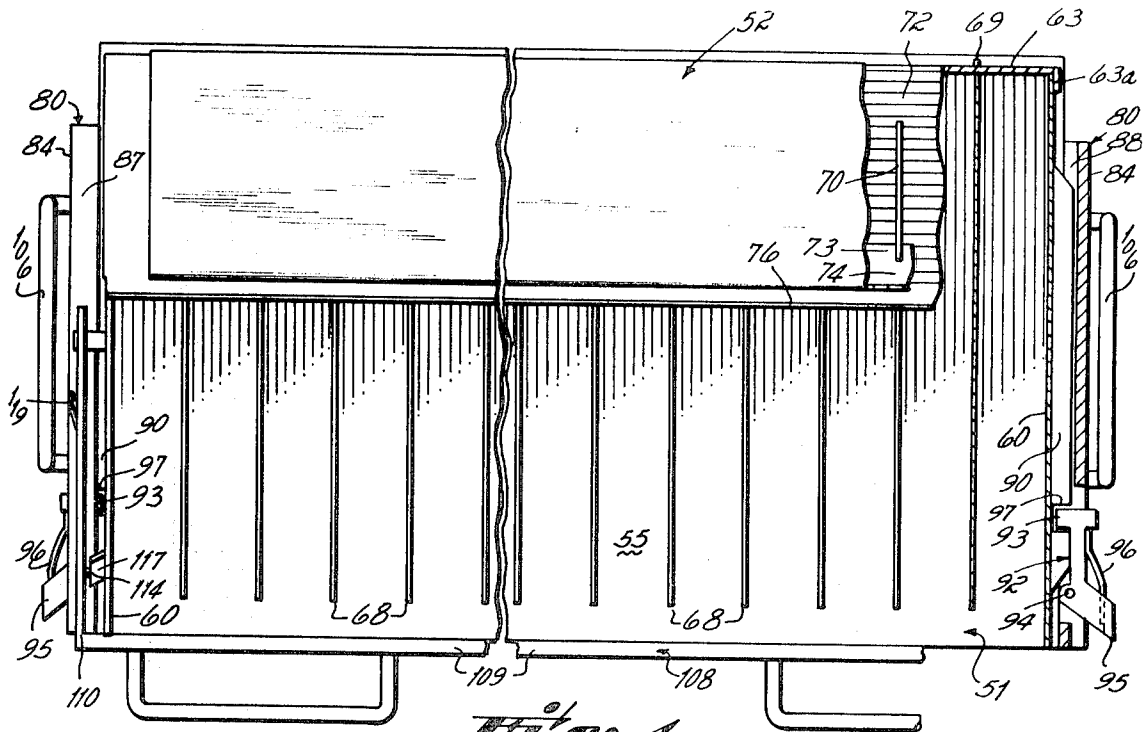


Fig. 3

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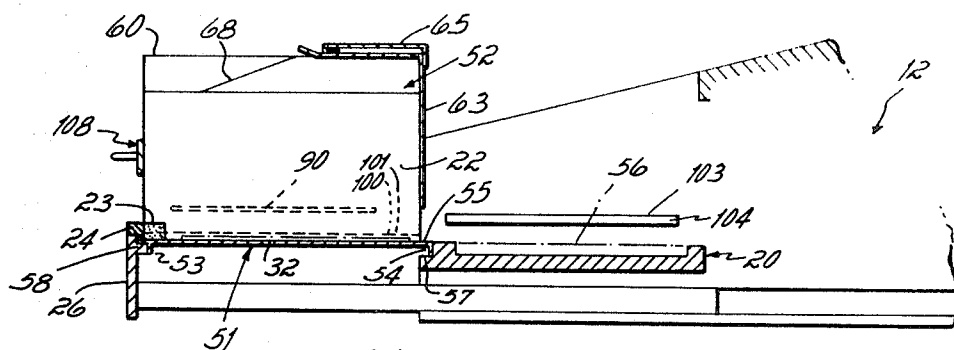


Fig. 6

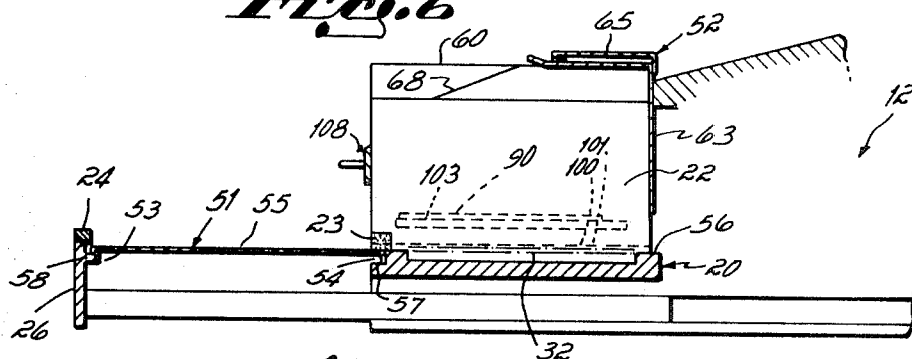


Fig. 7

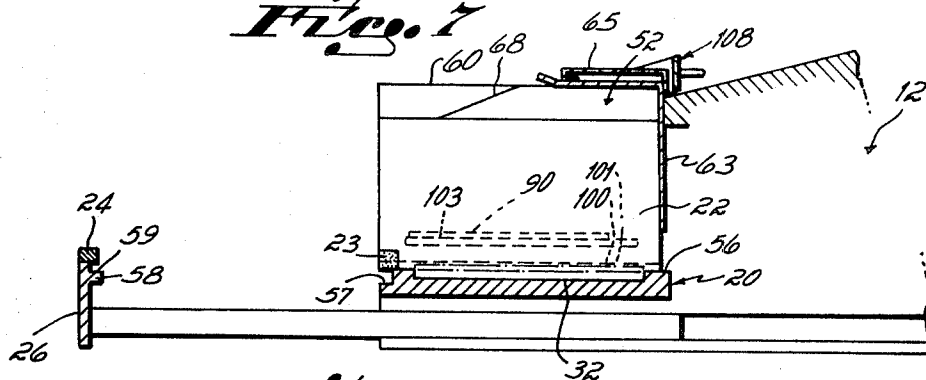


Fig. 8

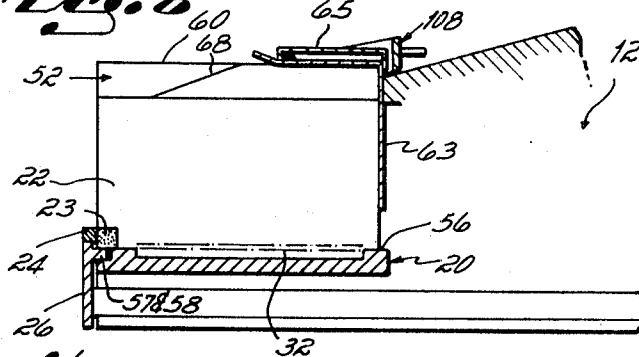


Fig. 9

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CARD STORAGE TRANSFER AND POSITIONING DEVICE FOR USE IN CONJUNCTION WITH CARD RETRIEVAL APPARATUS

This invention relates to retrieval systems which simultaneously search all edge-notched coded cards in a deck of similar cards randomly stored face-to-face in a selector apparatus and which, in consequence of such search, selectively retrieve from the deck one or more desired cards; and more particularly, to an accessory device for card retrieval systems of the foregoing type which facilitates the deck of cards in a selector to be rapidly and easily interchanged with any one of a large number of similar decks normally stored in a bank independently of the selector, thereby effectively increasing the card storage capacity of the retrieval system from a single deck to a bank of decks.

A card retrieval system of the type with which the accessory device of this invention finds an extraordinarily high degree of utility is disclosed and claimed in the copending application of Robert D. Parry, for ARTICLE SELECTION SYSTEM, Ser. No. 661,758, now U.S. Pat. No. 3,478,877, filed Aug. 4, 1967. In the Parry system, a plurality of rectangular cards are provided, each having teeth formed along a sorting edge, preferably the bottom edge, which are selectively removable for coding purposes and which are spaced from each other by intermediate registration notches. The cards are also provided with a lock notch and removed corner section. The lock notch and removed corner section are positioned along the sorting edge between the group of removable teeth and their associated registration notches, and an adjacent transverse card edge herein termed the "trailing edge."

The card further includes a ferromagnetic implant or chip mounted in the transverse edge of the card opposite the trailing edge, herein termed the "leading edge."

A plurality or deck of cards, numbering up to approximately 2,000 cards, are randomly stored in face-to-face vertical relation in a card selector apparatus. The card selector apparatus is provided with a horizontally disposed planar slotted platen which supports the upstanding cards. The orientation of the platen and cards relative to each other is such that the code-notched sorting edges of the randomly stored cards rest on the platen with their sorting edges transverse to the platen slots. Disposed in the platen slots are a plurality of code, or sort, bars corresponding in number to, and aligned with, the registration notches formed by the spaces between the code-notched teeth. The sort bars, which normally are positioned with their upper edges flush with the top surface of the platen, are selectively elevatable to an upper, or set, position wherein their upper edges protrude above the platen into the associated card registration notches of the stored cards. Located parallel to the sort bars and opposite the lock notches of the stored cards is a transversely disposed lock bar which is selectively elevatable to a card lock position. In the card lock position the lock bar is susceptible of being positioned in the lock notches of those cards whose lock notches are aligned with the lock bar. An elongated magnet is transversely disposed relative to the stored cards opposite and in alignment with the ferromagnetic chips implanted in the leading edges of the cards. The elongated magnet is mounted on a drawerlike structure for movement toward and away from the implanted ferromagnetic chips of cards positioned in their normal stored position on the platen, that is, the magnet is mounted for movement in a direction parallel to the sorting edges of the stored cards.

Card selection in the Parry retrieval system is effected in two sequential steps, namely, an initial separation step and a further or final separation step. The initial separation step is accomplished by elevating or setting the sort bars in a pattern conforming to the removed tooth pattern of the desired card or cards, and thereafter moving the magnet a distance equal to one tooth in a direction parallel to the sorting edge. Ideally the desired cards, that is, the cards having a removed tooth pattern conforming to that of the set sort bars, shift laterally in the direction of their sorting edges a distance equal to the width of one tooth, and in so doing align their removed corner

sections in the trailing edge with the lock bar. This movement is possible because the teeth of the desired cards located adjacent to the set sort bars are removed by virtue of the code notching process. The undesired cards, that is, those cards with a nonconforming removed tooth pattern, are not free to move in a direction parallel to their sorting edge, and consequently remain stationary, leaving their trailing edge lock notches aligned with the lock bar. Once initially separated, the desired cards are further separated from the undesired cards by moving the magnet further in a direction parallel to the card sorting edges an additional distance, the magnitude of which depends on the amount of separation between the selected and unselected cards which is ultimately desired.

However, prior to moving the magnet the additional distance necessary to effect further separation of the desired and undesired cards, the lock bar is elevated to engage the lock notches of the unselected cards which have remained stationary and aligned with the lock bar during the initial phase of magnet movement. The elevated lock bar does not engage the lock notches of the desired cards because these cards, in the course of the initial separation phase of the retrieval process, shifted laterally, that is, parallel to their sorting edges, relative to the undesired cards a distance sufficient to locate the lock bar in transverse registry with the removed corner sections of the desired cards. With the lock notches of only the undesired cards engaged by the set lock bar, the sort bars are reset and the magnet moved further in a direction parallel to the sorting edge. This further separates the desired cards from the undesired cards which are positively restrained from movement by the lock bar which engages their lock notches. Thus, the lock bar positively prevents, during the final separation step, selection of undesired cards.

The Parry card retrieval system provides rapid and reliable card retrieval to a degree heretofore unknown by virtue of its ability to simultaneously search all cards in the deck positioned in the selector and positively lock or restrain movement of undesired cards. However, in certain applications the Parry system could be of even greater benefit were it possible to conveniently use a single card selector apparatus with a vastly larger number of cards than is possible to store in the card selector itself. From the standpoint of conveniently useful storage capacity, the storage capacity of the system, using a single selector, is more or less limited to the capacity of the selector apparatus itself. If the selector apparatus is designed to store a deck of cards numbering approximately 2,000, then the conveniently useful storage capacity of the retrieval system is 2,000.

The only practical way, at present, of increasing the card storage capacity of the Parry retrieval system is to increase the number of card selectors and, in turn, correspondingly increase the number of total cards in the system. The disadvantage of increasing the card storage capacity in this manner is that the cost of the card retrieval system, which to a large extent is determined by the cost of the card selectors, increases more or less linearly as the card storage capacity of the system increases. Thus, a 4,000-card capacity retrieval system utilizing two card selectors costs approximately twice that of a 2,000-card capacity system utilizing a single card selector; a 6,000-card capacity system utilizing three selectors costs approximately three times that of a single selector, 2,000-card system; and so on.

Of course, it is possible to increase the capacity of a single selector system by removing the cards individually or in groups from the selector and placing them in a box or other temporary storage device, and substituting for the removed cards new cards by the same individual or group insertion method. This obviously is not a convenient or workable practice.

Accordingly, it has been an objective of this invention to increase the effective storage capacity of single selector card retrieval systems of the type disclosed in the copending Parry application, and do so without unduly increasing the cost of the equipment utilized in the system. This objective has been

accomplished in accordance with certain principles of this invention by adopting a fundamentally different approach to the card capacity problem which contemplates the use, in combination with a single card selector apparatus, of a plurality of individual card decks normally stored in a bank independently of the card selector. The card decks are each stored in a multipurpose card tray of unique and very unobvious design which facilitates rapid and easy interchange of the card deck in the selector with any one of the plurality of decks in the bank. Thus, the card storage capacity of the system is effectively increased from a single deck to as many decks as there are in the bank.

The card trays in a preferred embodiment of the invention are of generally two-piece design, including a substantially planar bottom panel against which the sorting edges of the cards rest when vertically disposed in face-to-face relation, and a retaining structure at least partially surrounding the upstanding cards which is positionable between an engaged and disengaged position relative to the bottom panel. The retaining structure, when engaged with the bottom panel, cooperates therewith to store the cards in the tray, and when in the course of being positioned between the engaged and disengaged positions, functions to transfer the cards between a position of support on the bottom panel and a position of support on the platen of the card selector, thereby transferring the cards between the tray and the selector.

In operation, and assuming the absence of any cards in the selector, any one of the decks of cards in the bank can be operatively positioned in the selector by merely removing from the bank the tray containing the desired deck and positioning it relative to the selector such that the bottom panel thereof is substantially coplanar with the upper surface of the platen. This done, the retaining structure is moved relative to the bottom panel from its engaged position, wherein it cooperates with the panel to store the cards in the tray, to its disengaged position, wherein it is located in the selector. In the course of this relative movement of the bottom panel and retaining structure, the retaining structure slides the deck of cards, which it surrounds, off of the bottom panel and onto the platen of the selector, thereby completing transfer of the cards to the selector. The bottom panel is now disassociated from the selector, and card selection can commence. Transfer of the cards from the selector to the tray is effected by reversing the foregoing steps.

To facilitate positioning the bottom panel of the tray substantially coplanar to the upper surface of the platen as is useful to effect card transfer, the drawerlike structure of the Parry card selector, which mounts the transverse magnet used in selecting cards, is preferably first moved to its outermost position. In this position the drawer cooperates with the platen to support, in the desired coplanar relation, the bottom panel of the tray which is positioned thereon.

A further objective of this invention has been to provide the tray with means to maintain the cards properly oriented in vertical face-to-face relation when stored in the tray bank remote from the selector, when being transferred between the selector and the bank, and when in the selector. This objective has been accomplished by securing to the retaining structure of the tray, a plurality of spaced parallel, vertical separating panels. Because the retaining structure of the tray is operatively associated with the card when the cards are both stored in the tray and operatively positioned in the selector, as well as during transfer therebetween, the separator panels, which are secured to the retaining structure, are continuously in operative relation with the cards, maintaining them in the desired orientation at all times. Additionally, since the cards and separating panels are continuously associated by virtue of the separating panels and retaining structure being integral, there is no possibility that the trailing edges of the cards will abut the separating panel during transfer to the tray or selector, which would otherwise be likely to occur were the separating panels permanently secured either in the selector or to the bottom panel of the tray.

These and other advantages and objectives of the invention will be more readily apparent from a detailed description of a preferred embodiment thereof taken in conjunction with the drawing in which:

FIG. 1 is a perspective view of a retrieval system incorporating the card tray improvement of this invention.

FIGS. 2A-2E are schematic side elevational views of a card selector showing the relationship, during different phases of a card retrieval cycle, of the transverse magnet, lock and sorting bars, and desired and undesired cards.

FIG. 3 is a perspective view, partially cut away, of a preferred embodiment of the tray of this invention showing the retaining structure thereof partially disengaged from the bottom panel of the tray.

FIG. 4 is a plan view of the tray.

FIG. 5 is a cross-sectional view of the tray with the bottom panel thereof supported coplanar to the upper surface of the platen by the drawer and platen.

FIGS. 6, 7 and 8 are diagrammatic cross-sectional views of the tray showing the relationship of the various components thereof with respect to the selector apparatus during different phases of the process of transferring a deck of cards from the tray to the selector.

FIG. 9 is a cross-sectional view of the card selector prior to a retrieval cycle.

Referring to FIG. 1, a card retrieval system is depicted of the general type disclosed in the previously referenced Parry application. The entire disclosure of the Parry application is specifically incorporated herein by reference. The retrieval system of FIG. 1 is seen to include a keyboard control console 10, a card selector 12, and a bank 14 of card decks 16a, 16b... stored in individual trays, to be described, which are conveniently located for easy removal in a case 18. The card selector 12 includes enclosed within a housing 13, a stationary horizontally disposed planar platen 20 which supports a deck of randomly stored vertically disposed cards 22. A transversely disposed elongated magnet 24 common to all the cards 22 and in alignment with ferromagnetic chips 23 implanted in the cards is secured to a drawerlike structure 26 for sliding movement between an outer position (FIGS. 1 and 5-8 to which desired cards are advanced in a manner to be described and an inner position (FIG. 9) in which the magnet 24 is in contact with the ferromagnetic implants 23 when the cards are stored in their normal position as shown in FIG. 1.

As best seen in FIGS. 2A-2E, the cards 22 each have a toothed sorting edge 32, preferably the lower edge thereof, provided with alternate teeth 34-1 to 34-6 and registration notches 34-1 to 35-6. Each of the teeth 34-1 to 34-6 is susceptible of being encoded by selective removal, as by notching, of the respective tooth. The sorting edge 32 further includes a lock notch 36 located between a group of encodable teeth 34 and registration notches 35, and the transverse card edge 38 herein termed the "trailing edge." Adjacent to the lock notch 36 is a removed portion 40 of the card located intermediate the lock notch 36 and the trailing edge 38. The card 22 further includes the ferromagnetic chip 23 implanted in the card at the corner of the sorting edge 32 and a transverse edge 44 herein termed the "leading edge."

When the cards 22 are in their normal unselected position on the platen 20 of the selector 12, the registration notches 35-1 to 35-6 and the lock notch 36 are aligned with a plurality of transversely disposed sort bars 48-1 to 48-6 and the lock bar 50 which are disposed transverse to, and in common with, all the cards. Both the sorting bars 48-1 to 4-6 and the lock bar 50 are appropriately positioned in slots formed in the upper surface of the platen 20. The bars 48-1 to 48-6 and 50 are elevatable from a reset position wherein their upper edges are flush with the upper surface of the platen to a set position wherein they enter their associated notches 34-1 to 35-6, and 36, respectively, of cards located in the storage position. Elevation of the bars 48-1 to 48-6 and 50 is effected by solenoids (not shown) controlled by the keyboard console 10.

To select a card or cards 22 having a particular code, for example, a card 22a having teeth 34-2 and 34-6 removed, from among a group of cards 22b not having teeth 34-2 and 34-6 removed, from among a group of cards 22b not having teeth 34-2 and 34-6 removed, the appropriate sort bars 48 are elevated to the set position. Specifically, sort bars 48-2 and 48-6 corresponding to the removed tooth pattern of the desired card 22a are elevated to the position shown in FIG. 2B. With the sort bars 48-2 and 48-6 in a set position, the desired cards 22a having teeth 34-2 and 34-6 removed can be laterally shifted in the direction 46a of arrow 46 a distance equal to the width of one tooth, to produce an initial separation of the desired cards from the undesired cards. However, the undesired cards 22b having tooth 34-2 and/or tooth 34-6 removed are restrained from lateral movement in the direction 46a of arrow 46 by one or both of the set or elevated sort bars 48-2 and 48-6, which, in the set position, mechanically interfere with the unremoved teeth 34-2 and 34-6 of the undesired cards 22b.

With the sort bars 48-2 and 48-6 conforming to the removed tooth pattern of the desired card 22a in the set position, the magnet 24 is shifted in the direction 46a of arrow 46 a distance equal to the width of one tooth to the position shown in FIG. 2C. Those cards free to shift, namely, the desired cards 22a move with the magnet 24 a distance of one tooth width, effecting an initial separation of the desired and undesired cards. Movement of the desired cards 22a in this fashion aligns the removed portion 40 of the desired cards opposite the lock bar 50. The undesired cards 22b do not move in the direction 46a of arrow 46 by reason of the engagement of one or more of their unremoved teeth 34-2 and 34-6 with the set sort bars 48-2 and 48-6, respectively. Consequently, the lock notches 36 of the undesired cards 22b remain aligned with the lock bar 50.

Further separation of the desired cards 22a from the undesired cards 22b is effected by elevating to a set position the lock bar 50, and to an unset position the sort bars 48-2 and 48-6, as shown in FIG. 2D. Setting lock bar 50 positively prevents the undesired cards 22b from moving in response to the continued movement of the magnet 24 in the direction 46a of arrow 46. Resetting or lowering the set sort bars 48-2 and 48-6 after the initial card separation phase enables the selected cards 22a to continue movement in the direction 46a of arrow 46 in response to movement of the magnet 24 in this direction, the desired cards 22a being free to move in this direction by reason of the removed portion 40 thereof being aligned with the elevated or set lock bar 50. With the lock bar 50 set and the sort bars 48 all in their lower, reset position, the magnet 24 is advanced further in the direction 46a of arrow 46 to the position shown in FIG. 2E, further separating the desired cards 22a from the undesired cards 22b.

The trays in which the decks of cards 16a, 16b... are individually stored in the bank 14 and which are used to transfer the cards from the bank to the selector 12 are best shown in FIGS. 1 and 3-5. Referring to these figures the trays are seen to include a substantially planar bottom panel 51 and a card retaining structure 52. The bottom panel 51 is generally rectangular in shape having a length substantially coextensive with the length of the platen 20 of the selector 12, and a width slightly in excess of the length of the sorting edge 32 of a card 22 as best shown in FIG. 5. The bottom panel 51 of the tray is preferably fabricated of sheet metal and provided with elongated parallel lips 53 and 54 which project downwardly from the panel 51 at the front and rear edges thereof. The vertical dimension of the rear lip 54 is selected such that the upper surface 55 of the panel 51 is coplanar with the upper surface 56 of the platen 20 when the lower edge of the lip 54 rests on a suitably disposed transverse ledge 57 formed in the front edge of the platen by removal of the corner thereof.

The lip 53, as seen in FIG. 5, is rearwardly displaced from the front edge of the panel 51 at a distance sufficient to permit it to clear the rear surface 58 of a rearwardly extending ledge 59 which supports the marginal front portion of the bottom

panel when the drawer 26 is extended to its outer position to facilitate transfer of the cards between the tray and the platen 20 of the selector 12. The lip 53 is sufficiently close to the front edge of the panel 51 to prevent the panel from moving relative to the supporting ledge 59 an amount sufficient to cause the lip to become disengaged from the ledge and thereby destroy the coplanar relation between the upper surface 55 of the panel 51 and the upper surface 56 of the platen 20.

The retaining structure 52 also includes opposite side panels 60 and 60, a connecting rear panel 63, and a top panel 65. The rear panel 63 and top panel 65 are provided at the opposite sides thereof with forwardly extending lips 63a and downwardly extending lips 65a, respectively, which are connected by suitable means, such as spot welds, to marginal portions of the rear edges and top edges, respectively, of the side panels 60 and 60, maintaining the side panels in operative position parallel to each other and perpendicular to the rear panel 63 and top panel 65. The top panel 65 further includes lip 65b extending downwardly from its rear edge which is secured, by suitable means such as spot welds, to the upper marginal edge of the rear panel 63.

Positioned between the side panels 60 and 60 of the retaining structure 52 are a plurality of partitions or divider panels 68 which, when the cards are both stored in the tray and operatively supported on the platen in the selector 12, as well as when the cards are being transferred between the selector and tray, function to maintain the cards in a substantially vertical position. To secure the partition 68 in operative association with the retaining structure 52, the partitions are each provided with tabs 69 and 70 formed integral with and extending rearwardly and upwardly, respectively, from the rear and upper edges of the partition. The tab 69 is configured to engage in locking relation with a suitably configured slot formed in the rear panel 63, as best shown in FIGS. 3 and 5. The tab 70 is configured to lockingly engage in a horizontal channel formed by an edge 71 of a forwardly extending lip 72 formed integral with the upper portion of the rear panel 63 and an edge 73 of a rearwardly extending lip 74 formed integral with and disposed parallel to the top panel 65.

A strip 77 having a downwardly and rearwardly extending cam surface 76 is secured to the lower surface of the lip 74. Cam surface 76 functions to cam downwardly the upper corner of the trailing edge of any cards whose sorting edge is displaced from the upper surface of the platen 20 or panel 51 as such card is inserted in the deck.

Mounting structures generally indicated by the reference numerals 80 and 80 mount the retaining structure 52 relative to the bottom panel 51 for sliding movement between a fully engaged position (FIGS. 4, 5 and 6) and a fully disengaged position (FIGS. 1, 7, 8 and 9). The mounting structures 80 and 80, which are mirror images of each other, each include an elongated block 84 having an outer surface 85, an inner surface 86, an upper surface 87, and a lower surface which is secured in contact with the upper surface 55 of the bottom panel 51. Formed in the inner surface 86 of the blocks 84 are elongated horizontal slots 88 which slidably receive guide ledges 90 extending laterally from the outer surfaces of the side panels 60 and 60. Horizontally disposed levers 92 having inwardly extending detents 93 are mounted for pivotal movement in the forward portion of the slots 88 by vertically disposed pins 94, the lower ends of which are anchored in the blocks 84. Extending downwardly and integral with a portion of the levers 92 are ears 95 which are biased by the free ends of leaf springs 96 secured by fasteners 91 to the outer surfaces 85 of the blocks 84, normally urging the detents 93 inwardly toward the surfaces 86 of the blocks. With the detents 93 normally positioned as such, the detents engage slots 97 formed in the guide ledges 90 when the retaining structure 52 is in its fully engaged position relative to the bottom panel 51, thereby preventing relative sliding movement between the retaining structure 52 and the bottom panel 51. Disengagement of the detents 93 and slots 97 to permit sliding movement between

the retaining structure 52 and the bottom panel 51 is effected by urging the ears 95 inwardly, overcoming the bias of the springs 96. This pivots the levers 92 about the pin 94 to move the detents 93 outwardly of the inner surfaces 86 of the blocks 84, disengaging them from slots 97.

The guide ledges 90 and guide slots 88 are positioned relative to the upper surface 55 of the bottom panel 51, the lower edges 100 of the side panels 60 and 60, and the lower edges 101 of the partitions 68 such that when the retaining structure 52 and bottom panel 51 are engaged the lower edges of the side panels 60, 60 and partitions 68 are spaced from the upper surface 55 of the bottom panel 51 by an amount at least exceeding the vertical height through which the sort bars 48 and lock bar 50 are moved when elevated to the set condition during card selection. With the tray parts so relatively positioned, when the retaining structure 52 is slidably transferred from the tray to the selector 12 whereat the guide ledges 90 rest on the upper surface 103 of inwardly projecting stationary guide ledges 104 formed in the sidewalls of the selector, the lower edges 101 and 100 of the partitions 68 and side panels 60, 60 will be spaced sufficiently above the upper surface 56 of the platen 20 such as not to mechanically interfere with the elevated sort bars 48 and lock bar 50 during a card retrieval cycle.

The mounting blocks 84 of the trays are provided with a pair of conveniently configured and located handles 106 which project from the outer surfaces 85 of the blocks 84.

To permit individual cards 22 to be selectively inserted into or removed from a deck when the deck is stored in the tray, a pivotal arm 108 is provided. The arm 108 includes a horizontal central portion 109 disposed transversely to the partitions 68 and side panels 60 and 60. Arm 108 also includes a pair of parallel end sections 110 at one end which are pivotally mounted to the side panels 60 and 60 by pins 111 and at the other end secured to the opposite ends of the center portion 109. The pivotal arm 108 is movable between a lower position depicted in solid lines in FIG. 3, wherein insertion or removal of cards from the deck stored in the tray is prevented, and an upper position shown in phantom lines in FIG. 3 wherein card insertion and/or removal from the deck is possible.

To lock the pivotal arm 108 in its lower position, the end sections 110 are provided with suitable locking levers 112 positioned in slots 113 formed in the end sections 110. The locking levers 112 are provided with inwardly extending detents 114 which are inwardly biased against the outer surface of the side panels 60 and 60 by leaf springs 115 fastened to the lock levers 112 and the end sections 110. Outwardly extending ears 117 projecting from the side panels 60 and 60 engage the detents 114 of the locking levers 112 to prevent the pivotal arm 108 from being moved to its upper position. Disengagement of the detents 114 and the ears 117 is effected by urging inwardly the angled ends 119 of the locking levers 112. With the detents 114 and the ears 117 disengaged, the pivotal arm 108 can be freely moved from its lower position to its upper position.

Assuming the selector 12 is devoid of cards 22 and of the retaining structure 52, a deck of cards 22 stored in a tray located remotely from the selector 12 in the case 18 is transferred to the selector in operative relationship with the platen 20, sorting bars 48, and lock bar 50 in a manner to be described. Specifically, the tray containing the deck to be transferred is removed from the case 18 and brought to the selector 12 and the drawer 26 is moved to its outer position. The tray is then positioned in the selector 12 as shown best in FIGS. 5 and 6 with the lower edge of lip 54 resting on ledge 57 formed in platen 20 and the lower surface of the front edge panel 51 resting on inwardly extending ledge 58 of drawer 26 with lip 53 behind the lip 59 of ledge 58. With the bottom panel of the tray so positioned, the upper surface 55 thereof is substantially coplanar with the upper surface 56 of the selector platen.

The ears 95 of the lock levers 92 are now urged inwardly to disengage the detents 93 and the slots 97 formed in the guide

ledges 90. This disengages the retaining structure 52 and the bottom panel 51, permitting them to slide relative to each other. The pivotal arm 108 which is locked in its lower position (shown in solid lines in FIG. 3) by engagement of the ears 117 and the detents 114 is urged rearwardly in a direction parallel to the sorting edges of the cards. As the pivotal arm 108 is urged rearwardly, the guide ledges 90 projecting from the side panels 60 and 60 of the retaining structure 52 slide off of the guide slots 88 and onto the guide surfaces 103 of the ledges 104 projecting from the walls of the selector 12. As the guide ledges 90 move from a position in the slots 88 to a position on the ledges 104, the retaining structure 52 moves from a position overlying the panel 51 to a position overlying the platen 20. Movement of the retaining structure 52 in the manner indicated causes the cards 22 initially supported by the upper surface 55 of the bottom panel 51 to slide from the bottom panel onto the upper surface 56 of the platen 20, as shown best in FIG. 7.

When the retaining structure 52 and the cards carried thereby have moved from the position shown in FIG. 6 to the position shown in FIG. 7, the bottom panel 51 may be removed from its position supported by the ledges 57 and 58, and the pivotal arm 108 can be swung from its lower position shown in FIG. 7 to its upper position shown in FIG. 8. Pivotal movement of the arm 108 is effected by disengaging the detents 114 and the cooperating ears 117, which is accomplished by urging the tabs 119 inwardly. With the bottom panel 50 removed and the pivotal arm 108 in its upper position, as best seen in FIG. 8, the drawer 26 can be returned to its innermost position with the magnet 24 thereof contacting the ferromagnetic implants 23 of the cards 22, as best shown in FIG. 9. With the drawer 26 and magnet 24 so positioned, the card selection cycle described previously in connection with FIGS. 2A-2E may be initiated. Transfer of cards from the selector to the tray for storage in the case 18 is accomplished by performing the foregoing steps in reverse order.

Having described my invention, what I desire to claim by Letters Patent is:

1. Apparatus for use in association with coded cards having planar faces and an edge which in at least one operative orientation are disposed in substantially parallel noncoplanar relationship with their edges aligned, said apparatus comprising:

a card-selecting mechanism including a card-supporting structure for supporting a plurality of coded cards which are disposed in at least one operative orientation in parallel noncoplanar relationship with their edges aligned,

a multipurpose device for storing cards independently of said card-supporting structure, said cards being stored with their faces disposed in parallel noncoplanar relationship and their edges aligned, and for transferring said cards between said device and said card-selecting mechanism for support by said card-supporting structure, said device including,

a. a planar panel relative to which cards can move when being transferred between said device and said card-selecting mechanism, said planar panel being normally remotely located and physically disconnected relative to said support surface of said card-selecting mechanism, and

b. retaining structure at least partially enclosing said cards and positionable between first and second positions relative to said panel, and cooperating with said panel, and cooperating with said panel, when in said first position, to store said cards and, when in the course of being positioned between said first and second positions, to move said cards relative to said planar panel and thereby transfer said cards between storage in said device and support by said card-supporting structure, respectively.

2. The apparatus of claim 1 wherein said multipurpose device includes means for slidably mounting said planar panel and said retaining structure to permit said retaining structure to be easily maintained in operative position relative to said

panel when said retaining structure moves between its first and second positions when transferring said cards between storage in said device and support by said selector supporting structure, respectively.

3. The apparatus of claim 1 wherein said supporting structure has a planar card-supporting surface adapted to supportingly engage the edges of cards which are disposed substantially perpendicularly thereto, wherein said multipurpose device stores said cards with said cards disposed substantially perpendicularly to said panel, and wherein said apparatus further includes positioning means associated with said planar panel and with said card-selecting mechanism for positioning said panel and card-supporting surface in coplanar relation to permit said cards disposed substantially perpendicularly to said panel and supporting surface to slide from one of said panel and supporting surface to the other, and thereby facilitate transfer of said cards between storage in said device and support by said supporting surface in said card-selecting mechanism.

4. The apparatus of claim 1 wherein said supporting structure includes a planar supporting surface adapted to supportingly engage the edges of cards which are disposed substantially perpendicularly thereto, wherein said multipurpose device stores said cards with said cards disposed substantially perpendicularly to said panel, wherein said panel and retaining structure are engaged and disengaged when said retaining structure is in said first and second positions relative to said panel, respectively, and wherein said multipurpose device includes a plurality of parallel partitions disposed substantially perpendicularly to said panel and mounted for movement with said retaining structure for maintaining cards in substantially perpendicular disposition relative to said supporting surface when said retaining structure is in said second position and disengaged from said panel and said retaining structure and partitions are positioned in said selector and said cards are transferred to said supporting structure.

5. The apparatus of claim 1 wherein said multipurpose device includes a barrier movable between one position in which cards stored in said device are selectively removable and another position in which cards stored in said device are unremovable.

6. The apparatus of claim 3 wherein said positioning means includes a draw-type assembly slidably mounted by said card-selecting mechanism for movement, in a direction parallel to the direction in which said cards slide, between an outer position wherein said assembly at least partially supports said planar panel coplanar to said supporting surface and an inner position wherein said assembly is adjacent cards supported on said supporting structure.

7. Apparatus for use in association with coded cards having planar faces and an edge which in at least one operative orientation are disposed in parallel noncoplanar relationship with their edges aligned, said apparatus comprising:

- a card-selecting mechanism including a card-supporting structure for supporting a plurality of coded cards, which are disposed in at least one operative orientation in parallel noncoplanar relationship with their edges aligned,
- a multipurpose device for facilitating storage of cards in substantially parallel relation independently of said card-supporting structure and for maintaining said cards when operatively associated with said card-selecting mechanism disposed substantially perpendicular to said card-supporting structure, said device including
 - a. opposite sidewalls and a central wall interconnecting said sidewalls, said walls collectively at least partially surrounding a plurality of said cards and susceptible of being alternatively removably positioned on said card-

supporting structure and positioned independently of said selector to facilitate storage of cards by said supporting structure of said selector and remote from said selector, respectively,

- b. a plurality of partitions fixed relative to at least one of said walls and disposed to maintain cards surrounded by said walls in substantially perpendicular disposition to said support structure when said walls and cards are positioned on said card-supporting surface, as well as to maintain said cards parallel when said walls and cards are positioned independently of said selector.

8. A multipurpose device for storing and transferring cards having a sorting edge notched in a coded pattern which is useful with a card-selecting mechanism having a card-supporting surface for slidably engaging the sorting edges of cards disposed perpendicularly thereto with their edges aligned and further having sorting bars selectively elevatable above said supporting surface into engagement with the notched sorting edges of cards supported on said supporting surface, said device comprising:

- a planar panel relative to which the sorting edges of cards perpendicularly disposed thereto are adapted to slide when cards are transferred between storage in said device and support by said supporting surface in said selector, said panel having front, rear and opposite side edges,
- a retaining structure positionable between engaged and disengaged positions relative to said panel, said retaining structure including at least opposite sidewalls and an interconnecting member, and being susceptible of disposition with said opposite sidewalls perpendicular to said panel and in association with said opposite side panel edges, respectively, when said retaining structure and panel are engaged, and susceptible of disposition remote from said panel when said retaining structure and panel are disengaged, and

mounting means for slidably mounting said planar panel and said opposite sidewalls to permit said retaining structure to be maintained in operative position relative to said planar panel when said retaining structure moves between its engaged and disengaged positions to transfer said cards between storage in said device and support by said supporting structure.

9. The device of claim 8 wherein said retaining structure further includes a plurality of partitions disposed parallel to and between said opposite sidewalls for maintaining cards enclosed by said walls perpendicularly disposed relative to said supporting surface when said retaining structure is positioned in said selector.

10. The device of claim 9 further including a barrier movable between a first position whereat said barrier is adjacent said front edge and spans said opposite sidewalls for enhancing the retainment of cards stored in said device and a second position whereat said barrier is nonadjacent said front edge to facilitate removal of cards stored in said device.

11. The device of claim 9 wherein said interconnecting member is a rear wall and wherein said retaining means includes a top panel means spaced from said planar panel and spanning said opposite sidewalls for engaging, when said cards and retaining structure are in said selecting mechanism, cards at the edge opposite their sorting edge for preventing disengagement of said card-sorting edges and said supporting surface.

12. The device of claim 11 further including means associated with said opposite sidewalls and engageable with said selector mechanism for maintaining said partitions in noncontacting relationship with said sorting bars when said bars are elevated.