

[54] **CARTRIDGE CARD TRAY**

[75] Inventor: **John H. Lanahan**, Whitesboro, N.Y.

[73] Assignee: **GAF Corporation**, New York, N.Y.

[22] Filed: **Dec. 12, 1973**

[21] Appl. No.: **423,907**

[52] U.S. Cl. .... 209/80.5, 206/73, 211/50

[51] Int. Cl. .... B07c 1/20

[58] Field of Search ..... 209/80.5, 110.5; 206/73, 206/74; 211/50, 51; 220/4; 312/183, 188, 193

[56] **References Cited**

**UNITED STATES PATENTS**

|           |         |              |          |
|-----------|---------|--------------|----------|
| 3,616,902 | 11/1971 | Parry .....  | 209/80.5 |
| 3,630,354 | 12/1971 | O'Brien..... | 209/80.5 |

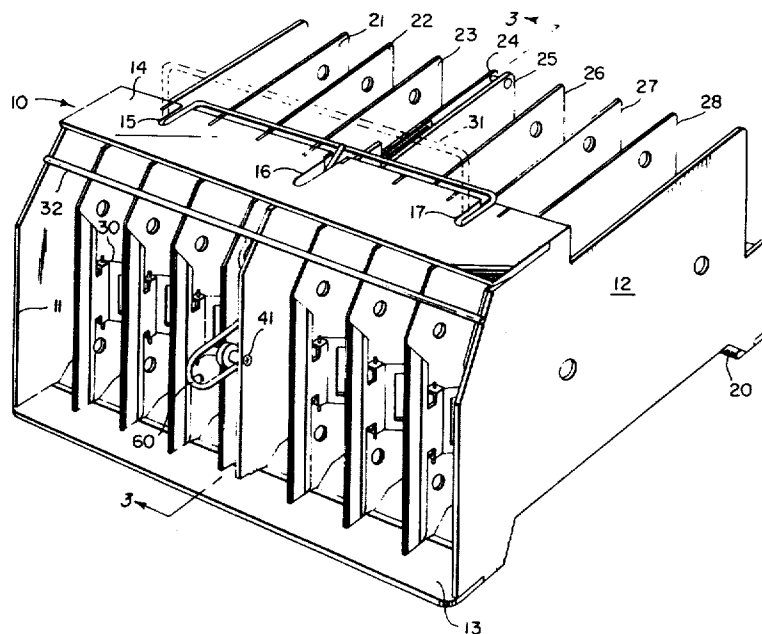
*Primary Examiner*—Allen N. Knowles

*Attorney, Agent, or Firm*—Walter C. Kehm; Samson B. Leavitt; Arthur Dresner

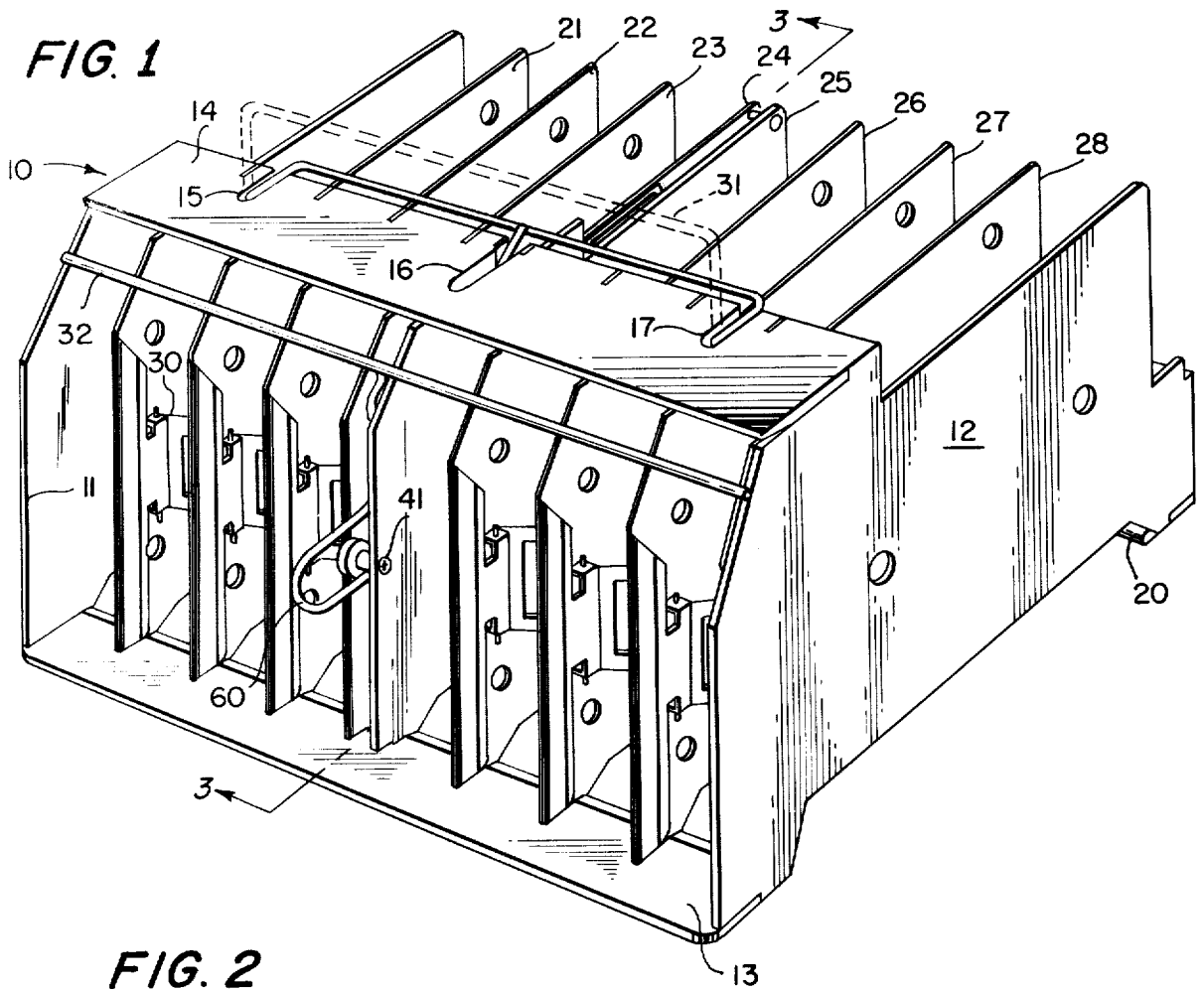
[57] **ABSTRACT**

A cartridge card tray for holding a pack of information cards both in storage and on line in a card sorting apparatus. A card locking bar is connected to a lever movable between an open position for leaving the front end of the tray unobstructed and a blocking position at which the bar blocks the front end to prevent card removal. A handle on the tray is movable between a raised operative position and a retracted inoperative position. The lever, when in the open position, locks the handle in its retracted inoperative position. A lift bar on the tray is engaged by the lever in the open position to in turn cooperate with a cam on the card sorting apparatus to move the tray vertically to brace it against horizontal front to rear movement.

**22 Claims, 5 Drawing Figures**



**FIG. 1**



**FIG. 2**

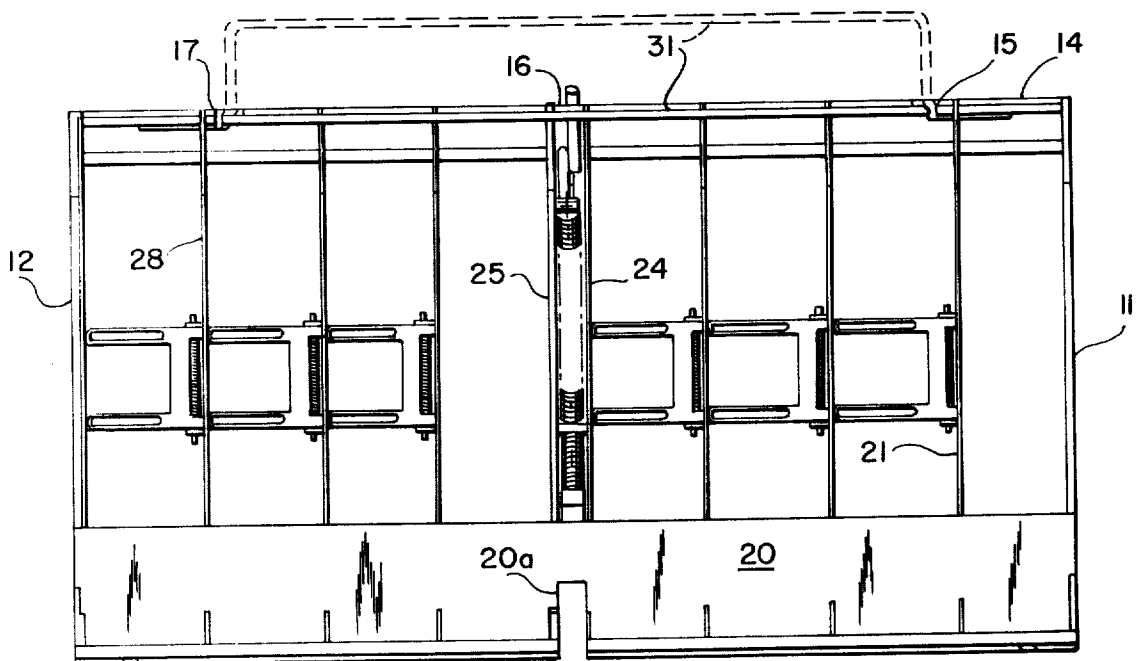


FIG. 3

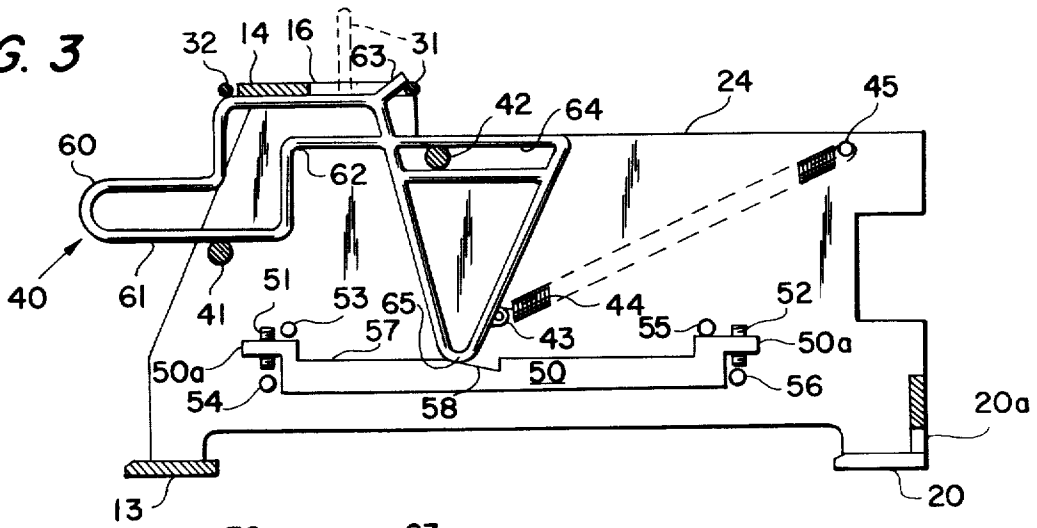


FIG. 4

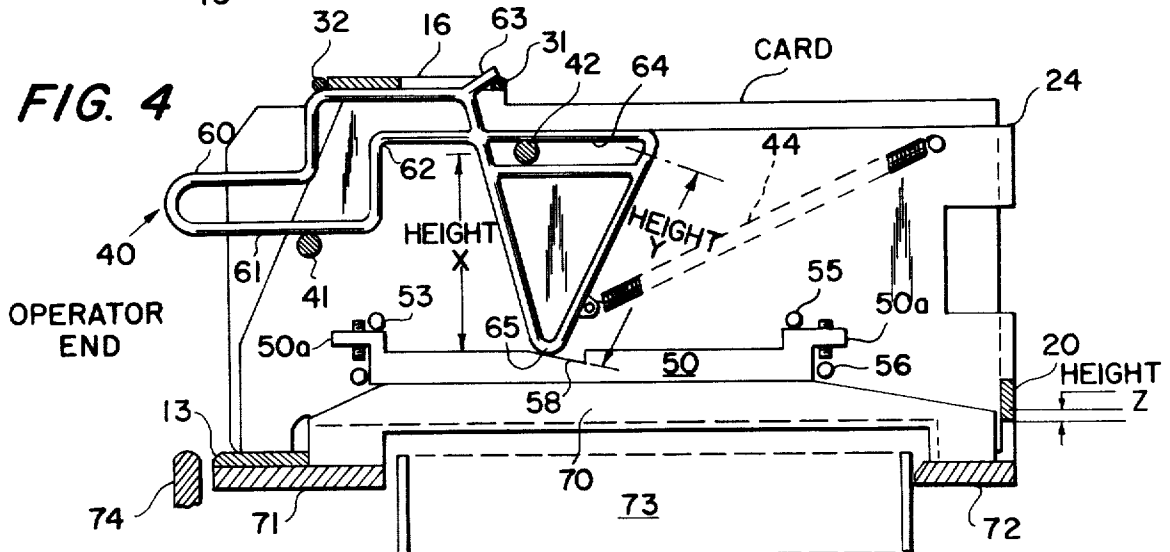
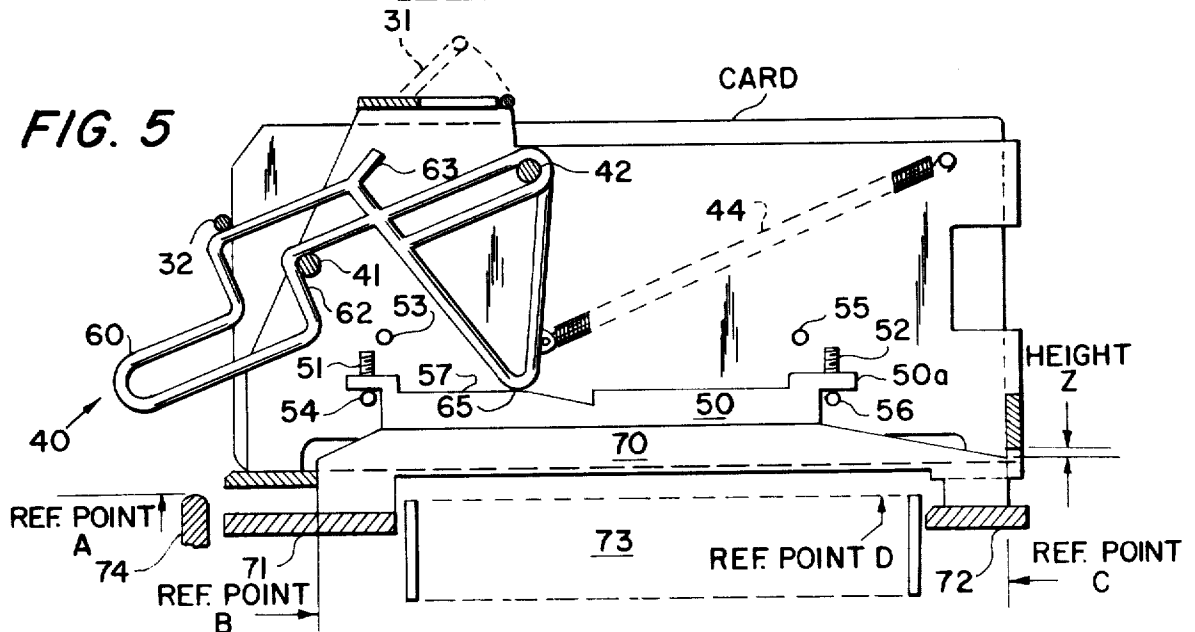


FIG. 5



## CARTRIDGE CARD TRAY

## BACKGROUND OF THE INVENTION

This invention relates to the handling of information bearing cards, and in particular it relates to a cartridge card tray for holding a batch of information cards both in storage and on line in a card sorting apparatus.

It is known to code information onto a card by notching an edge of the card, preferably the bottom edge, wherein a given arrangement of notches on the bottom of the card represents a certain item of information. Such bottom edge notch cards are sorted by cooperation of the notches with code bars positioned beneath the cards. One apparatus for sorting bottom edge notch cards is shown and described in my U.S. Pat. No. 3,586,166, issued June 22, 1971, the subject matter of which patent is incorporated reference herein.

In this type of apparatus, the cards are arranged in random within a given batch. During a given sorting procedure, certain code bars are raised relative to the other code bars, and the cards within the batch having notches matching the selected code bars drop downwardly relative to the remaining cards of the pack and these selected cards are subsequently separated from the remaining cards.

While the cards in a batch are arranged in random, the cards within a given batch are normally kept together. There would normally be many more batches than could possibly fit into the card sorting apparatus at any given time. This presents no problem with respect to the overall capacity of the apparatus since the batches would probably be used separately. For example a sales force may have a different batch of cards for each geographic sales region and it might be appropriate to analyze only one batch at any given time. In view of the fact that in a given operation there will be far more cards than can fit into the card sorting apparatus at any given time, it becomes necessary to store the batches not in use away from the apparatus itself. For this purpose it has been appreciated for some time that it would be suitable to provide a tray capable of holding a batch of cards both in storage and on line in a card sorting apparatus so that the tray can simply be taken off of the shelf and inserted into the card sorting apparatus. However, there have been a number of problems associated with previously known card sorting trays.

Firstly, it is necessary or at least highly desirable to provide a handle for carrying the tray. However, with a poorly designed structure, the handle can hinder the smooth movement of the tray into the card sorting apparatus. Another disadvantage of such trays is that while the trays may be subjected to abuse while off of the machine, they must be highly precise and consistent when located in the apparatus. Another disadvantage which is again related to the need for precision when the trays are located within the apparatus is that a certain amount of "play" must be provided in the vertical direction if the tray is to be inserted at all into the apparatus. However, once in place the tray must be secured quite firmly if the card sorting procedure is to be carried out properly. Still another disadvantage of known trays is that either the cards would fall out the front end or a cumbersome means would have to be provided for closing off the front end of the tray.

A typical tray which includes some of the above described disadvantages is shown in U.S. Pat. No. 2,861,706.

Thus, there exists a need for a new and improved tray for carrying information cards which will overcome the above disadvantages.

## SUMMARY OF THE INVENTION

Thus, it is a purpose of the present invention to provide a new and improved tray for carrying information cards both in storage and on line in a card sorting apparatus, which tray overcomes the disadvantages of previously known trays.

This purpose of the present invention is achieved by providing a "cartridge" card tray having a number of unique features which overcome the disadvantages of previous card trays. The term cartridge is used since the tray of the present invention is of the type which can be taken from storage and inserted or "plugged" directly into the apparatus. The cartridge card tray of the present invention comprises a bottom support surface, side supporting means such as walls or the like and a means for limiting rearward movement of the cards into the tray. The tray includes an operating means such as a lever preferably mounted on the tray for movement within a plane, this lever carrying a card locking bar towards its front end. The lever is movable between at least an open position wherein the front of the tray is completely open for inserting and removing cards and a locking position wherein the card lock bar extends across in front of all of the cards in the tray, thus preventing removal thereof.

In a preferred embodiment of the invention, the tray further includes a handle movable between a raised operative position and a retracted inoperative position. In a preferred arrangement, this handle is held in its inoperative position when the lever moves to its open position.

In accordance with another feature of the invention, a means is provided for changing the vertical positioning of the tray after it is in the card sorting apparatus. This feature, which includes a lift bar capable of limited vertical movement and engaged by the lever provides the construction wherein the tray can be easily inserted with sufficient vertical clearance and then moved vertically thus becoming braced in place such that horizontal movement of the tray is prevented thereafter. Consequently, the tray will be firmly secured in place during normal operation of the card sorting apparatus.

Thus, it is an object of this invention to provide a new and improved card tray for storing information cards.

It is another object of this invention to provide a card tray for holding information cards which includes a means for blocking the cards to prevent removal thereof from the tray.

It is still another object of this invention to provide a card tray having an operating means for blocking or opening the front end of the tray and a handle for holding the tray and wherein the operating means is effective to hold the handle in its inoperative position when the operating means opens the front end of the tray.

It is still another object of this invention to provide a cartridge card tray which can be easily inserted into a card sorting apparatus but which can then be braced against horizontal movement after it is in place in the apparatus.

It is still another object of this invention to provide a cartridge card tray having an operating lever movable in a vertical plane and including a card locking bar fixed thereto such that the card locking bar either opens or blocks the front end of the tray and further including a control surface which cooperates with a lift bar for vertically positioning the tray in a card sorting apparatus so as to prevent horizontal movement of the card tray in the forward-rear direction in the card sorting apparatus.

Other object and the advantages of the present invention will become apparent from the detailed description to follow, together with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

There follows a detailed description of a preferred embodiment of the invention to be read together with the accompanying drawings wherein:

FIG. 1 is a prospective view of a cartridge card tray according to the present invention.

FIG. 2 is a rear elevational view of the card tray of FIG. 1.

FIG. 3 is a cross-sectional view taken in the plane of line 3—3 of FIG. 1.

FIG. 4 is a cross-sectional view similar to FIG. 3 but further illustrating an information card and portions of a card sorting apparatus so as to illustrate the relationship of the tray to the card sorting apparatus.

FIG. 5 is a cross-sectional view similar to FIG. 4 but illustrating another position of the tray.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, like numerals are represented by like elements throughout the several views.

Referring to FIGS. 1 through 3, the cartridge card tray 10 comprises side walls 11 and 12 and a bottom support surface comprising a front platform 13 and a rear platform 20. The rear platform 20 is L shaped in cross-section as is evident from FIG. 1 and it extends completely across the rear of the tray except for the cut out 20a in the center thereof. A top tie plate 14 extends across the top of the tray and is connected to the side walls 11 and 12. This plate 14 includes a pair of cut outs 15 and 17 for receiving a handle 31. As is evident in FIG. 2, the ends of this handle, after passing through the respective slots 15 and 17, turn outwardly and are held in place by the vertical partitions to be explained in detail below. These outwardly turned portions form the pivot axis for the handle 31 as it pivots between the retracted inoperative position as shown in solid lines in the figures and the raised operative position as shown in dotted lines in the figures. The top plate 14 also includes a central cut out 16, the purpose of which will be explained below.

To achieve maximum efficiency in separating the selected cards from the remaining cards, it is preferable that all of the cards be maintained in an upright position. For this purpose, there are provided a number of vertical partitions 21, 22, 23, 24, 25, 26, 27 and 28 between the side walls 11 and 12. To further assist in keeping the cards vertical, a light spring 30 is provided in each space between adjacent partitions, said spring 30 being mounted on one of the walls forming a bay between adjacent partitions and sprung lightly outwardly toward the other wall. As cards are placed into any

given bay, the cards will push the spring 30 back, but the spring 30 will retain the cards in an upright position.

The card tray of the present invention can be constructed in any size. However, it has been found most appropriate to construct the tray so that it holds 500 cards of a size generally referred to as "IBM" cards. The overall unit should be of a size capable of being stored in a standard data card file drawer.

The space between partitions 24 and 25 includes the operating means provided for opening or blocking the front of the tray and also for securely positioning the tray in place after it has been inserted into the card sorting apparatus. Referring now to FIG. 3, this operating means includes an operating lever 40 having a card lock bar 32 extending across the front thereof (see also FIG. 1). A fixed locking pin 41 and a fixed pivot pin 42 extend across the space and are fixed to one or both of the plates 24 and 25. The operating lever 40 includes a grip portion 60 having a guide surface 61 which terminates rearwardly in a vertical surface which terminates at locking recess 62. The lever further includes a handle locking pin 63, the purpose of which will be explained below. The lever further includes a pivot pin slot 64 which receives the pivot pin 42. The lever 40 is urged rearwardly by means of a spring 44 which is anchored at end 43 to the lever 40 and at its other end to a pin 45 rigid with the plates 24 and/or 25. The operating means further includes a lift bar 50 having a pair of ears 50a which have passing therethrough adjustment pins 51 and 52. These pins 51 and 52 are threaded and passed through threaded openings in the ears 50a so that the vertical positions of these pins can be adjusted. This lift bar 50 is capable of limited vertical movement, bounded at the upper limit by engagement of the tops of ears 50a with upper abutment pins 53 and 55 and downward movement is limited by engagement of the pins 51 and 52 with lower abutment pins 54 and 56. The pins 53, 54, 55 and 56 are fixed with respect to the plate 24 and/or plate 25. The top of lift bar 50 includes a straight surface 57 and a recess 58. The lever 40 includes a lift bar control surface 65 which cooperates with the top of the lift bar 50.

The operation of the invention will be described with respect to FIGS. 4 and 5. However, before explaining the operation, the additional elements of FIGS. 4 and 5 which correspond to elements of the card sorting apparatus will be described. Incidentally, while these elements of the apparatus will move during the card sorting procedure, they may be considered as fixed for the present discussion since they are indeed fixed during the time that the tray is inserted and removed. Referring now to FIG. 4, the apparatus includes front and rear rest members 71 and 72 and a cam 70 which extends up between the plates 24 and 25. There is also included a front riser bar 74 and the usual code bars 73.

Referring to FIGS. 4 and 5, the present invention operates as follows. Referring first to FIG. 5, this figure illustrates the tray with the operating lever 40 with the bar 32 blocking the front of the cards to prevent removal of the cards from the tray. At this time the pin 63 is out of the way of the handle 31 so that the handle can be pivoted upwardly for normal use. In this position the lever 40 is pulled forwardly until the slot 64 is in its forwardmost position with the pin 42 at the rear end of the slot. At this time also the pin 41 is received securely in the locking recess 62. In this position also the lift bar

control surface 65 engages the flat top 57 of the lift bar and urges the lift bar downwardly so that the pins 51 and 52 engage lower abutment pins 54 and 56. In this position the tray can be inserted into the machine. As indicated above, elements 71, 70 and 72 are fixed. The tray is then inserted from the left-hand side with the partitions 24 and 25 straddling the cam 70. Because of the cut out 20a the tray can indeed slip over the cam 70 from left to right until it reaches the position as shown in FIG. 5. Insertion has been made easier by the fact that the tray is constructed so as to pass-over the cam 70. Note in FIG. 5 the fact that the platforms 13 and 20 are spaced above their respective rest members 71 and 72 and the top of cut out 20a is spaced by a height Z above the upper rear corner of cam 70. However, this looseness which has made insertion easier must be removed so that the tray will be firmly secured in place for an effective card sorting procedure. First of all the handle 31 has been lowered to the retracted position even before tray was inserted into the apparatus. The operator then grips the portion 60 of lever 40 and lifts the same upwardly and pushes it back until the position of FIG. 4 is achieved. This movement accomplishes several results. Firstly, the card lock bar 32 is raised up and over the information cards. Next, the handle locking pin 63 moves over the handle 31, securing the same in place. Finally, the lift bar control surface 65 has now moved upwardly because of the fact that height X is less than the height Y, and as a result thereof the entire tray drops relative to the lift bar 50 until the platforms 13 and 20 rest on their respective rest members 71 and 72. This locates the tray vertically. In addition, the tray is secured against horizontal movement at reference point B by the engagement of the front platform 13 with the front end of the cam 70 and at reference point C by the engagement of the upper part of platform 20 above the slot 20a with the rear of cam 20.

The card tray is now secured in position and the card sorting apparatus may now be operated to select certain cards in the manner as explained in our said earlier patent.

Although the invention has been described in considerable detail with respect to a preferred embodiment thereof, it will be apparent that the invention is capable of numerous modifications and variations apparent to those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A card tray for carrying a pack of information cards both in storage and in a card sorting apparatus comprising:

- a bottom including a bottom support means for supporting the bottoms of the cards,
- side support means connected to the bottom support means, and,
- rear stop means, also connected to the bottom support means, for limiting rearward movement of the cards into the tray,
- the front end of the tray being opened to permit the insertion and removal of cards into and from the tray,
- said bottom support means including a front platform and a rear platform, both of said platforms extending across the bottom front and rear of the tray, respectively, and positioned to support, respectively, the front and rear of the bottoms of the cards, the

bottom being opened between the front and rear platforms to provide a space beneath all of the cards large enough to receive therein the code bars of a card sorting apparatus.

2. A card tray according to claim 1, including an operating lever means having a card locking bar attached thereto, the operating lever means being movable between at least a first position at which the card locking bar is located higher than the height of the cards above the bottom support surface to permit entry and removal of cards and a second position lower than the first position at which the card locking bar is positioned in front of the cards to prevent removal thereof out the front of the tray, said operating lever means comprising a lever constrained within the tray for movement in a vertical plane which extends front to rear of the tray.

3. A card tray according to claim 2, said operating lever having a grip portion extending forward beyond the forward edge of cards located in the tray, said code locking bar attached to the lever and extending completely across the front of the tray, said lever being movable forwardly and downwardly from said first to said second position to move the card locking bar from a location on top of the cards in the first position to a location in front of the cards in the second position.

4. A card tray according to claim 2, said lever having: a horizontal guide surface terminating rearwardly at an upwardly extending vertical surface which terminates at a locking recess surface, which surfaces ride on a fixed locking pin,

and a horizontally extending slot and a fixed pivot pin located therein,

and wherein when the lever is in its forwardmost position, the guide surface terminates forward of its locking pin while the pivot pin is located at the rear end of the slot, whereby at said forward position of the lever the lever pivots downwardly about its pivot pin as the locking surface engages the locking pin.

5. A card tray according to claim 4, including a lift bar located in the plane of the lever and therebelow, means mounting said lift bar for limited vertical movement, said lever including a lift bar control surface extending downwardly and engaging the lift bar, permitting the lift bar to move upwardly in said first position and moving the lift bar downwardly in said second position, whereby said lift bar cooperates with fixed parts of a card sorting apparatus to permit or limit horizontal movement of the tray within the apparatus.

6. A card tray according to claim 4, said tray including a handle attached thereto and movable between a raised operable position and a lowered retracted position, and including a handle locking pin attached to the lever and positioned to hold the handle in the retracted position while the lever is in said first position.

7. A card tray according to claim 1, both of said side support means comprising walls including a recess in the bottom thereof, wherein said tray is positionable in a card sorting apparatus with the bottoms of the cards accessible to code bars between the said platforms and said recesses in the side walls to permit vertical relative movement of the code bars and the cards.

8. A card tray according to claim 1, including an alignment means on the tray cooperating with a card sorting apparatus for blocking the tray against horizontal movement after it has been inserted into the card sorting apparatus.

9. A card tray according to claim 8, said alignment means including means for adjusting the entire tray vertically from a raised position when the operating lever means is in its second position blocking the cards to a lowered position in response to movement of the operating lever means from its second position to its first position within the card sorting apparatus.

10. A card tray according to claim 9, including a lift bar located below the operating lever means, means mounting said lift bar for limited vertical movement, said operating lever means comprising a lever including a lift bar control surface extending downwardly and engaging the lift bar permitting the lift bar to move upwardly in the first position of the lever and moving the lift bar downwardly in the said second position of the lever, whereby said lift bar cooperates with fixed parts of the card sorting apparatus to permit or limit horizontal movement of the tray within the apparatus.

11. A card tray according to claim 1, including a handle attached to the tray and movable to an operative position spaced above the tray and to a retracted position adjacent the top of the tray, and said operating lever means including means for locking the handle in its retracted position when the operating lever means is in its first position.

12. card tray cardtray according to claim 11, said operating lever means comprising a lever constrained within the tray for movement in a vertical plane which extends front to rear of the tray, and said means for locking the handle comprising a locking pin fixedly attached to the lever.

13. A cardtray card tray carrying a pack of information cards comprising:

a bottom support surface for the cards,  
side wall means connected to the bottom support surface,

a rear stop means for limiting rearward movement of the cards into the tray, and wherein the front of the tray is opened to receive cards,

a handle attached to the tray and movable to an operative position spaced above the tray and to a retracted position adjacent the top of the tray,

an operating means movable to at least a first position at which the front of the tray is left unobstructed and a second position at which the operating means blocks the front open end of the tray, and said operating means including means for locking the handle in its retracted position when the operating means is in its first position.

14. A card tray according to claim 13, said handle being pivotally attached to the tray for pivotal movement between said raised and retracted positions, and said operating means including a locking pin which is positioned to prevent said pivotal movement of the handle from the retracted position to the raised position when the operating means is in its said first position.

15. A card tray according to claim 14, said operating means comprising a lever constrained within the tray for movement in a vertical plane which extends front to rear of the tray, and said means for locking the handle comprising a locking pin fixedly attached to said lever.

16. A card tray for carrying a pack of information cards comprising:

a frame comprising, a bottom support surface for the cards, an opening in said bottom support surface,

side walls means connected to the bottom support surface, and

a rear stop means also fixed to the bottom support surface for limiting rearward movement of cards into the tray, and wherein the front of the tray is open to receive cards;

and including alignment means on the tray cooperating with a card sorting apparatus for blocking the tray against horizontal movement in the front to rear direction after it has been inserted into the card sorting apparatus, said alignment means comprising a lift bar movable between a first position to permit movement of the tray into the card sorting apparatus, and a second position to lock the tray against horizontal movement by engagement of the apparatus with the frame through the open bottom thereof.

17. A card tray according to claim 16, an operating means movable to at least a first position at which the front of the tray is left unobstructed and a second position at which the operating means blocks the front open end of the tray, said lift bar mounted on the tray for limited vertical movement between said first and second positions, and said operating means including a lift bar control surface extending downwardly and engaging the lift bar and permitting the lift bar to move upwardly in said first position and moving the lift bar downwardly in the second position, whereby said lift bar cooperates with fixed parts of the card sorting apparatus to permit or limit horizontal movement of the tray within the apparatus.

18. A card tray according to claim 17, said operating means comprising a lever constrained within the tray for movement in a vertical plane which extends front to rear of the tray, said lever including a downwardly extending portion which includes the lift bar control surface at the bottom thereof.

19. A card tray according to claim 18, said lever having:

a horizontal guide surface terminating rearwardly at an upwardly extending vertical surface which terminates at a locking recess surface, which surfaces ride on a fixed locking pin,

and a horizontally extending slot and a fixed pivot pin located therein,

and wherein when the lever is in its forwardmost position, the guide surface terminates forward of its locking pin while the pivot pin is located at the rear end of the slot, whereby at said forward position of the lever the lever pivots downwardly about its pivot pin as the locking surface engages the locking pin.

20. A card tray for carrying a pack of information cards comprising:

a bottom support surface for supporting the bottom of the cards,

side wall means connected to the bottom, rear stop means for limiting rearward movement of the cards into the tray,

the front end of the tray opposite from the rear end being opened to permit the insertion and removal of cards into and from the tray,

and including an operating lever means having a card locking bar attached thereto, the operating lever means being movable between at least a first position at which the card locking bar is located higher than the height of the cards above the bottom sup-

port surface to permit entry and removal of cards and a second position lower than the first position at which the card locking bar is positioned in front of the cards to prevent removal thereof out the front of the tray, said operating lever means comprising a lever constrained within the tray for movement in a vertical plane which extends front to rear of the tray,

said lever having a horizontal guide surface terminating rearwardly at an upwardly extending vertical surface which terminates at a locking recess surface, which surfaces ride on a fixed locking pin, and a horizontally extending slot and a fixed pivot pin located therein, and wherein when the lever is in its forwardmost position, the guide surface terminates forward of its locking pin while the pivot pin is located at the rear end of the slot, whereby at said forward position of the lever the lever pivots downwardly about its pivot pin as the locking sur-

face engages the locking pin.

**21.** A card tray according to claim **20**, including a lift bar located in the plane of the lever and therebelow, means mounting said lift bar for limited vertical movement, said lever including a lift bar control surface extending downwardly and engaging the lift bar, permitting the lift bar to move upwardly in said first position and moving the lift bar downwardly in said second position, whereby said lift bar cooperates with fixed parts of a card sorting apparatus to permit or limit horizontal movement of the tray within the apparatus.

**22.** A card tray according to claim **20**, said tray including a handle attached thereto and movable between a raised operable position and a lowered retracted position, and including a handle locking pin attached to the lever and positioned to hold the handle in the retracted position while the lever is in said first position.

\* \* \* \* \*

20

25

30

35

40

45

50

55

60

65