Feb. 18, 1947. H. KNAUSS 2,415,891

MEANS FOR SORTING CARDS

Filed April 14, 1944 2 Sheets-Sheet 1

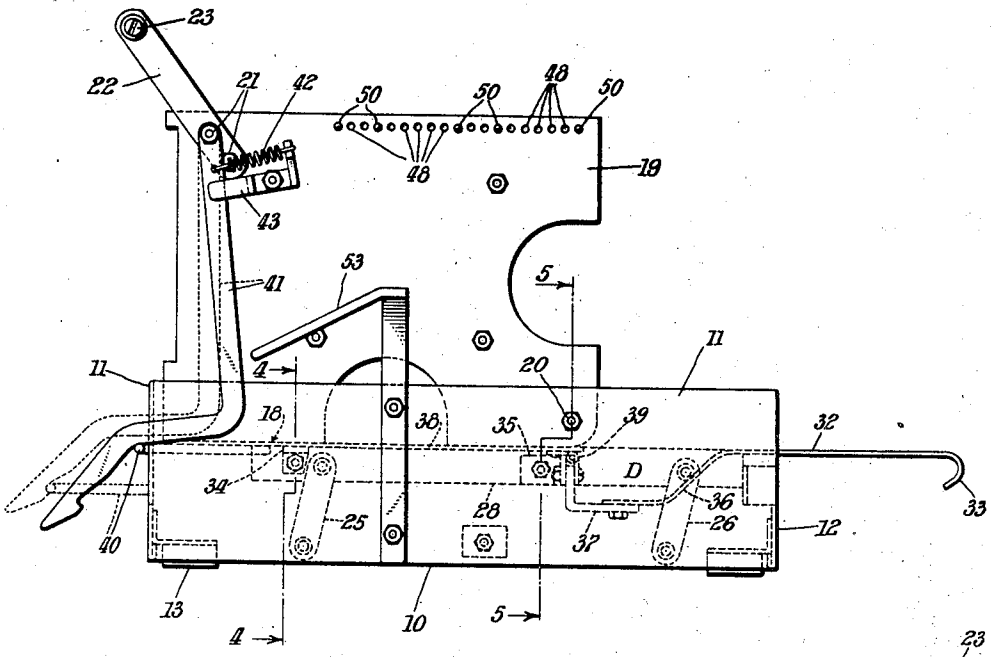


Fig. 1.

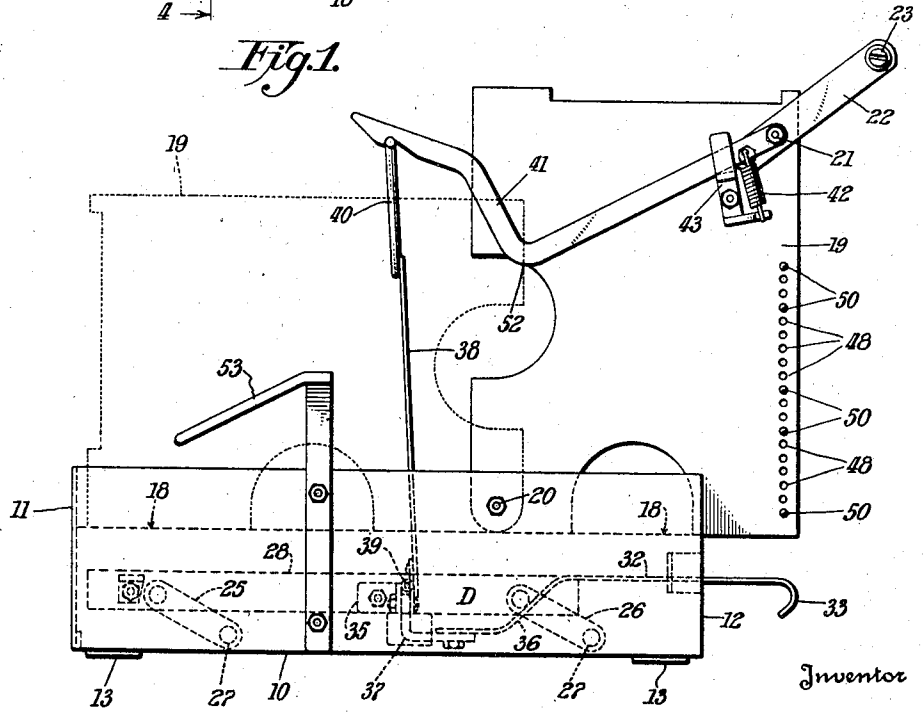


Fig. 2.

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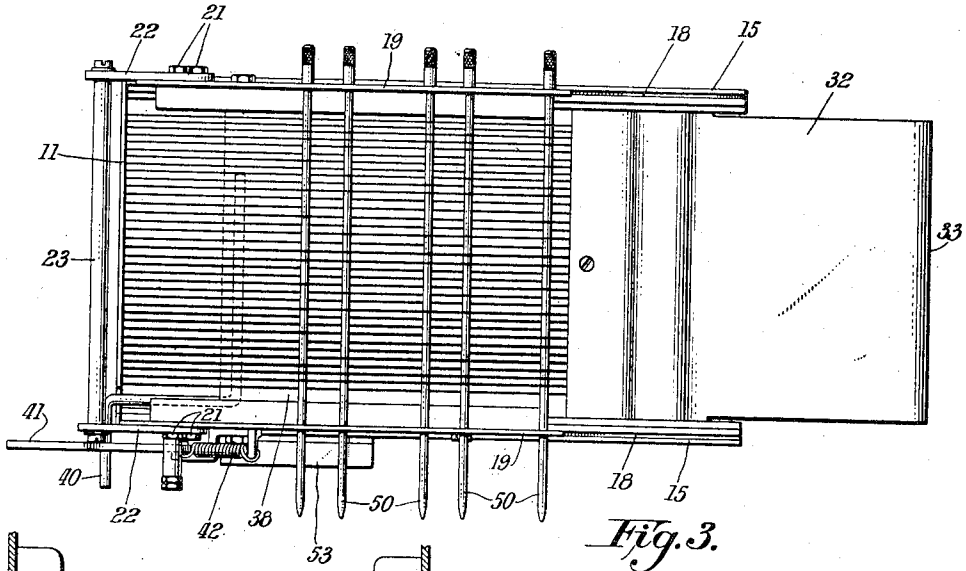


Fig. 3.

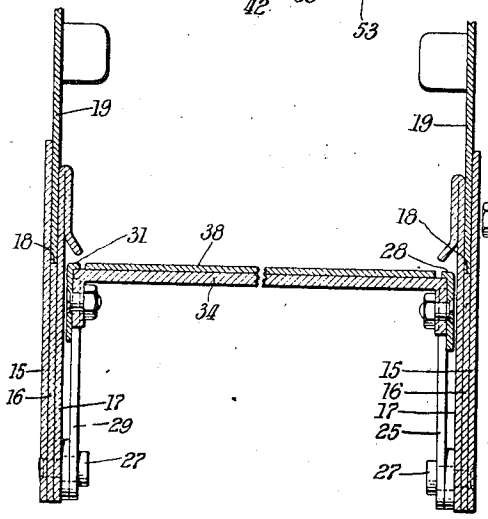


Fig. 4.

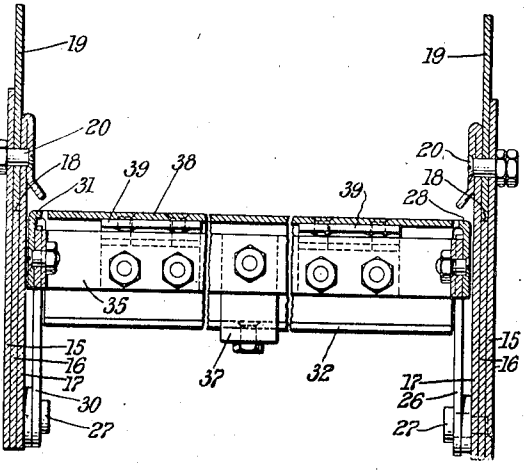


Fig. 5.

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UNITED STATES PATENT OFFICE

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MEANS FOR SORTING CARDS

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7 Claims. (Cl. 129—16.1)

1

This invention relates to a card sorting system and more particularly to a system of card sorting in which cards of the type shown and described in the patent to A. Perkins, No. 1,544,172, issued June 30, 1925, are used. As disclosed in this patent a number of cards are provided with a plurality of perforations which are punched in the cards adjacent one or more of their edges. These cards are then notched or slotted to cut away that portion of the card intermediate a selected one of the perforations and the edge of the card thereby forming a pattern of notches which indicates a certain classification. When this is done a stack of cards bearing various information thereon can be sorted into any desired sequence, or cards bearing the desired information may be segregated or selected from the stack of cards.

Heretofore in sorting cards of this kind it has been the practice to place a stack of cards in a container having a bottom wall and side-walls formed with notches in their upper edges. The perforations and notches in the edge of the stack of cards are aligned with the notches in the side-walls of the container and then a plurality of needles are inserted through the perforations in the cards. These needles are carried by a holder and after the needles have passed through the perforations and notches the cards are "fanned" and those cards having notches corresponding to the positions of the needles in their holder drop from the stack. The cards that are impaled on the needles are raised upwardly and removed from the container and placed in a separate tray.

One of the objects of this invention is to provide improved means for sorting and selecting desired groups of cards from a stack.

Another object of this invention is to eliminate repetitive card handling and to reduce the number of operations for selective sorting.

A further object of this invention is to simplify the handling of the cards and to reduce wear and tear on the holes of the cards by eliminating the "fanning" and manual lifting of the cards by the operator.

Further objects of this invention are to provide for immediate tabulating after sorting and immediate resorting of the cards, and to provide a method of card sorting in which some of the sorting needles remain in the cards from the first sorting operation to the last operation, and in which all of the needles need not be withdrawn after each sorting operation.

With the above and other objects in view, as will hereinafter appear, the invention comprises

2

the devices, combinations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Figure 1 is a rear elevation of my improved card sorting device, showing the position of the parts at the beginning of the card sorting operation.

Figure 2 is a rear elevation of the card sorting device shown in Figure 1, showing the position of the parts during one of the steps of the card sorting operation.

Figure 3 is a top plan view of the device shown in Figure 1.

Figure 4 is a sectional view taken along the line 4—4 of Figure 1.

Figure 5 is a sectional view taken substantially along the line 5—5 of Figure 1.

In the embodiment of the invention selected for illustration my improved card sorting device comprises a base, indicated generally as 10, having end walls 11 and 12 and side walls made of three sheet-metal plates 15, 16 and 17, these side and end walls forming a rectangularly shaped enclosure. The base 10 is provided at its corners with feet 13 which extend slightly below the base and are adapted to rest on a flat surface such as a table top.

As stated above the side walls are formed from three pieces of sheet metal 15, 16 and 17 (Figures 4 and 5) which may be spot welded or otherwise secured together. The pieces 15 and 17 are higher than the center piece 16 and their marginal edges extend above the piece 16 thereby forming a longitudinal U-shaped groove or slot 18. Located within the groove 18 in each side wall is an upstanding side-member or plate 19 which is pivoted to the members 15 and 17 of the side wall at 20. Fixed to each side-member 19 by the screws 21 is an arm 22, and these arms are connected together by a rod 23. This construction ties the side-members 19 together and at the same time serves as a handle for jarring or shaking the cards and for simultaneously moving the side-members 19 about their pivots 20.

Located within the base 10 and adjacent one side-wall is a pair of pivoted links 25 and 26 having one of their ends pivoted to the lower portion of the side-wall at 27 and their other ends pivoted to a rail 28. Located adjacent the opposite side-wall is a second pair of links 29 and 30 (Fig-

ures 4 and 5) which are likewise pivoted to this side wall and to a second rail 31. The rails 28 and 31 are connected at their right-hand ends, as viewed in Fig. 2, by a flat plate 32 which extends across the space between the rails and outwardly over the end wall 12, the free end of this plate is curved downwardly at 33 to form a handpiece for the operator.

The rails 28 and 31 are connected at their ends opposite to the plate 32 by a bar 34, and also at a point intermediate their ends by a bar 35. The forward end of the plate 32 is bent downwardly at 36 and is connected to the bar 35 by an L-shaped sheet metal member 37, thereby forming a depression indicated generally as D. From the above it will be observed that the rails 28 and 31 and the cross-members connecting the rails form a carriage which may be moved from the position illustrated in Fig. 1 to the position illustrated in Fig. 2 due to its pivotal mounting to the base through the links 25 and 26.

A plate 38 is pivotally mounted on the carriage at 39 and secured to the plate 38 is a rod 40 which extends through a suitable notch in the end wall 11 and has its free end bent to form an L (Fig. 3). Pivotally secured by one of the screws 21 to one of the side-members 19 is a latch 41 which is urged in a counter-clockwise direction about its pivot by a spring 42. The motion of the latch 41 under the influence of the spring 42 is limited by a stop 43 fixed to the side-member 19. The hooked end of the latch 41 cooperates with the free end of the rod 40 to cause the plate or bottom 38 to move with the side-members 19, the purpose of which will be hereinafter explained.

In the use of my improved card sorter a stack of cards is placed between the side-members 19 with the lower marginal edges of the cards resting on the plate 38 and the lower marginal side edges in engagement with the side walls. When the stack of cards is in this position in the card sorter the perforations and notches in the cards are in register with each other and with the holes 48 in the side-members 19. It will be understood that both side-members 19 are provided with holes 48 and these holes are identical.

The needles 50 are then inserted through the holes 48 and the aligned perforations and notches in the stack of cards. The end 33 of the plate 32 is pushed toward the base or toward the left as viewed in Figure 1 and this causes the plate 38 and its carriage to move to a position similar to, but lower than the position shown in Figure 1. When the plate 38 and its carriage are in their lowered horizontal position the cards that have notches located in the positions on the card which corresponds to the location of the needles 50 are free to drop down and become offset from the stack, it being understood that the remaining cards are impaled on the needles and hang therefrom.

In order to loosen the cards and to insure that the cards not impaled on the needles will drop down upon the lowered bottom 38 the handle 23 is grasped by the operator and the sides 19 and the stack of cards are vibrated rapidly about the pivot 20 and during each vibration the lower edge of the side-members 19 contact the upper edge of the plate 16 in the side walls thereby producing a jarring action. After the cards have been thus vibrated and jarred, all of the cards of the selected group will rest upon the bottom 38. The operator then swings the sides 19 and the cards located therebetween about the pivot 20. When

the bottom 38 is moved to its lowered position the rod 40 rides along the curved under portion of the latch 41 and due to the action of the spring 42 the rod 40 is retained in the depression located at the lower end of the latch so that when the sides and cards are swung about the pivot 20 the bottom swings about its pivot 39 and thereby carries the cards that have dropped or are offset from the stack up to the position shown in Fig. 2. After the sides and cards have reached the position shown in full lines in Fig. 2 the latch is raised slightly and the bottom 38 returned to its normal or horizontal position.

The cards of the selected group are now offset from the main stack and these cards may be counted or any data desired may be taken from them without removing them from the stack. After the desired information has been obtained each of the cards may be pushed back into the stack and the stack and sides turned about the transverse pivot and returned to their original position. When the sides 19 are swung down about the pivot 20 the portion 52 of the latch 41 engages the inclined plate 53 carried by the base and forces the free end of the latch 41 outwardly so that it will ride over the bent portion of the rod 40 and thereby be in a position to raise the plate 38 when the cards are again shifted about the pivot 20.

After the cards are down to the position shown in Fig. 1, one or more of the needles may be shifted to another hole to select another group of cards. This method is continued until all of the information that is desired has been taken from the stack of cards in the device and then the stack is removed and another stack of cards placed in my improved card sorter.

It will be apparent that after the offset cards have been pushed back into the stack one or more of the needles may be shifted when the side-members 19 are in the position shown in full lines in Fig. 2, and that it is not necessary to return the side-members to the dotted line position before the needles are shifted.

From the foregoing description it will be obvious that the elements employed and details of construction are susceptible of material variations and that my improved apparatus may be used with various types of cards including cards having perforations and slots in their body portion. The privilege is therefore reserved of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the appended claims.

Having thus set forth the nature of the invention, what I claim herein is:

1. A device for sorting cards having perforations and notches in their marginal edges comprising, a card holder having side-members formed with a plurality of openings and adapted to receive a stack of cards therebetween, a plurality of needles for insertion in selected openings in said side-members, means for pivotally supporting said side-members for movement about an axis arranged transverse to said side-members, and a plate arranged transverse to said side-members, said plate being mounted for pivotal movement relative to said side-members and bridging the space between said side-members.

2. A card sorting device comprising spaced side-plates adapted to receive a stack of substantially rectangularly shaped cards having perforations and notches in one of their marginal edges, each of said plates being formed with a plurality of openings, the openings in one of said

plates being in alignment with the openings of the other of said plates, needles adapted to be inserted through selected ones of said openings for selecting a group of cards from said stack, a bottom plate spaced at a distance less than the width of the cards from the marginal edges of the cards which are opposite the marginal edges containing the perforations and notches so that the selected group of cards is free to drop by gravity upon said bottom plate and become offset relative to said stack of cards, and means for swinging all of said cards through an angle of substantially 90° about a pivot arranged transverse to said cards to provide access to said offset cards.

3. A card sorting device including, in combination, spaced side-members, each of said side-members being formed with a series of apertures in alignment, pivotal means arranged transverse to said side-members and about which said side-members are adapted to be turned through an angle of at least 90°, and a plate member arranged transverse to said side-members and bridging the space between said side-members, said plate being hinged for movement relative to said side-members.

4. A card sorting device comprising spaced vertical side-members formed with a series of needle-receiving aligned perforations, and a plate arranged transverse to said side-members and bridging the space between said members, said side-members and plate being swingable simultaneously in a vertical plane through an angle of at least 90°, and means for detachably latching said plate to said side-members for independent relative movement between said side-members and said plate.

5. A card sorting device comprising spaced side-plates adapted to receive a stack of substantially rectangularly shaped cards having perforations and notches in one of their marginal edges, each of said plates being formed with a plurality of openings, the openings in one of said plates being in alignment with the openings of the other of said plates, needles adapted to be inserted through selected ones of said openings for selecting a group of cards from said stack, a bottom plate spaced at a distance less than the width of the cards from the marginal edges of the cards which are opposite the marginal edges containing the perforations and notches so that the selected group of cards is free to drop by gravity upon said bottom plate and become offset relative to said stack of cards, means for jarring said side-members, needles and cards to cause the selected group of cards to drop from said stack and a horizontal pivot about which said cards and side-members may be swung through an angle of substantially 90° to provide access to the offset cards.

6. A card sorting device comprising spaced side-plates adapted to receive a stack of substantially rectangularly shaped cards having perforations and notches in one of their marginal edges, each of said plates being formed with a plurality of openings, the openings in one of said plates being in alignment with the openings of the other of said plates, needles adapted to be inserted through selected ones of said openings for selecting a group of cards from said stack, a bottom plate spaced at a distance less than the width of the cards from the marginal edges of the cards which are opposite the marginal edges containing the perforations and notches so that the selected group of cards is free to drop by gravity upon said bottom plate and become offset relative to said stack of cards, said side-members and bottom plate being mounted for swinging movement about a horizontal axis through an angle of substantially 90° for the purpose of providing access to said offset cards.

7. A card sorting device comprising a support adapted to rest upon a table, spaced and parallel members adapted to receive a stack of cards therebetween, each of the cards of the stack having perforations and notches in at least one of its marginal edges, and said spaced members being formed with openings which will register with the perforations and notches in the cards, means for pivotally securing said members to said support for movement about a horizontal axis, a plurality of needles insertable through the openings in the spaced members for the purpose of selecting a group of cards from the stack, a bottom plate pivotally carried by said support and movable relative to said members, said plate bridging the space between said members and being adapted to support cards of the selected group when offset from the stack, and means for swinging said members about their horizontal pivot through an angle of at least 90° and simultaneously swinging said bottom plate from a horizontal to a vertical position.

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