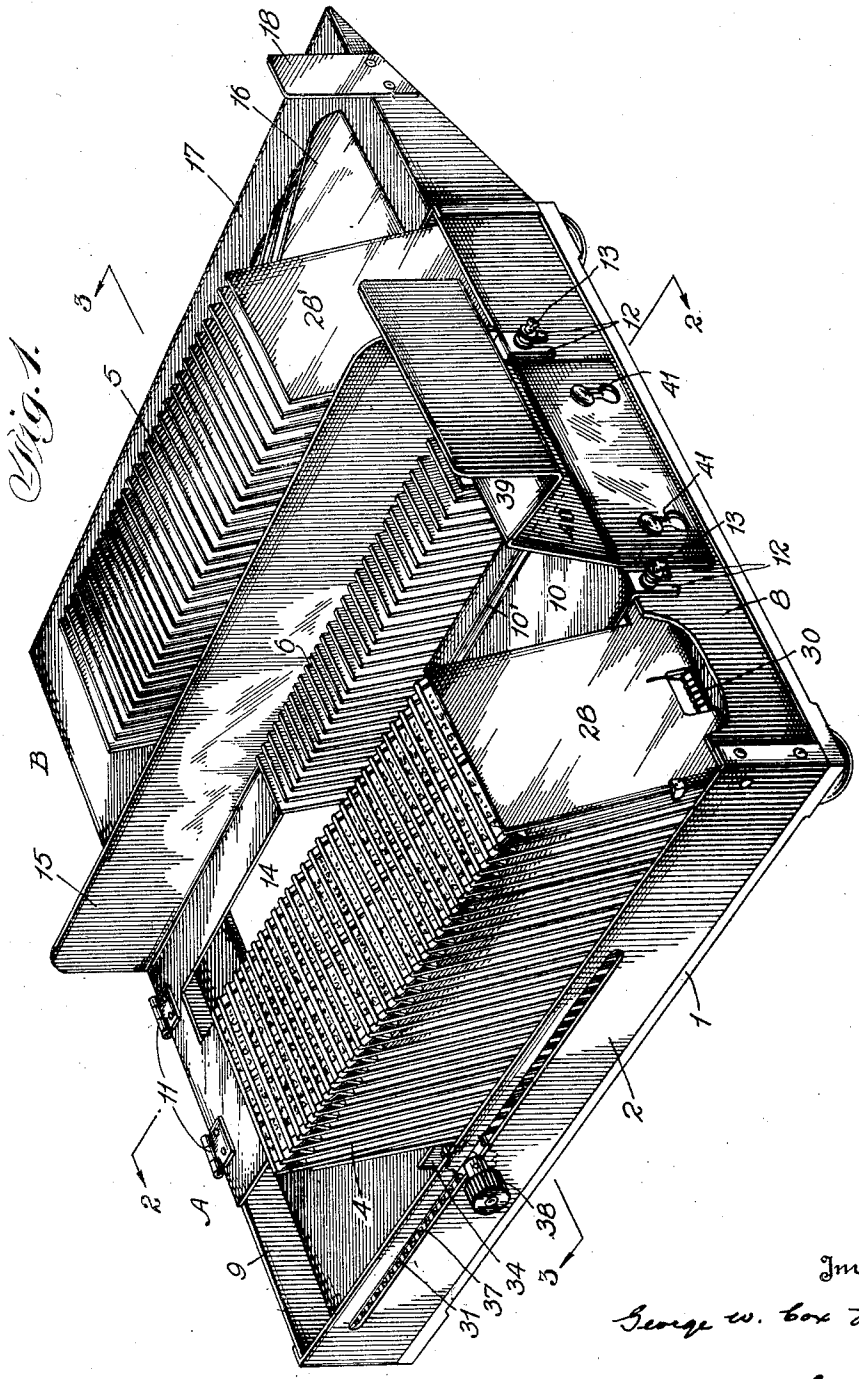
April 19, 1927. 1,625,711

G. W. COX, JR

SORTING DEVICE

Filed Sept. 26. 1925 2 Sheets-Sheet 1



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George W. Cox Jr.

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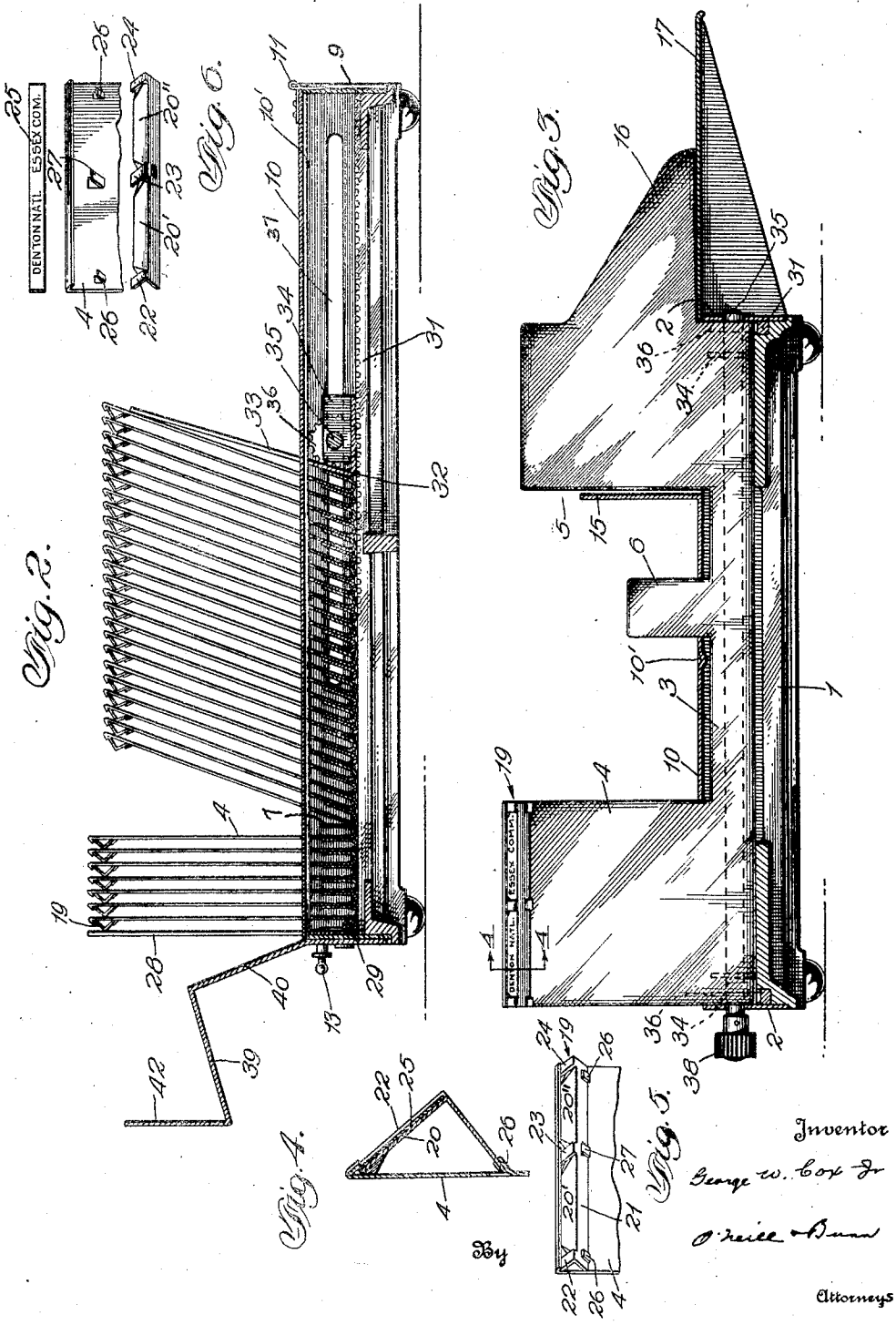
Attorneys

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SORTING DEVICE

Filed Sept. 26. 1925 2 Sheets-Sheet 2



Patented Apr. 19, 1927. 1,625,711

UNITED STATES PATENT OFFICE.

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SORTING DEVICE.

Application filed September 26, 1925. Serial No. 58,893.

This invention relates to improvements in sorting machines or devices, and especially to machines for sorting promiscuously arranged papers or other articles, into groups or classes, in accordance with indicia carried by the papers.

In my Patents Nos. 1,533,697 and 1,533,698, issued April 14, 1925 I have covered instrumentalities adapted to facilitate the operation of arranging papers in exact alphabetical, or in exact numerical order. The present invention however is intended to facilitate the operation of arranging all papers of a certain classification into one compartment, and all papers of another classification into another compartment, the number of the separated compartments being dependent upon the variety of classifications into which the papers are to be divided. In effect, the present invention is intended to abolish the well-known "pigeon-hole" system of sorting, in that it may provide the same number of classified spaces, occupying a very small fraction of the room required for a pigeon-hole battery, which spaces are normally closed except for that portion thereof which is occupied by the papers already inserted.

The structure embodying the invention is of great utility in the sorting or groupings of all promiscuously arranged papers, or articles which carry class indicia. In handling bank checks in the clearing houses the checks must be assorted in accordance with the name of the bank upon which each check is drawn, and the name of such bank is the class indicia herein referred to. The structure is of equal utility in the sorting of mail in the post offices, the class indicia being the State, the city, or the street, forming a part of the address. In department stores, in the sorting of sales slips, the indicia may be represented by the names or symbols indicating the particular departments.

In the pigeon-hole sort, as is well known, the maximum space is provided, and in most instances only a small proportion of such space is utilized during the regular sorting operation, the pigeon-hole cases not only being unsightly, but occupying a very large unused space. Furthermore the operator is required to cover this entire space in his sort, resulting in needless waste of time and exertion.

It is the object of this invention therefore to provide a multiplicity of normally closed spaces and means for opening such spaces as desired, and in accordance with the class indicia carried by the article being sorted, all of such spaces being within easy reach of the operator.

Another object of the invention is the provision of means permitting of gradual automatic separation of the walls defining said spaces, as the latter become filled with the articles being sorted.

Another object of the invention is the provision of means automatically closing each opened space after the article has been deposited therein.

Other objects of the invention will be made apparent in the following specification when taken in connection with the drawings forming a part thereof.

In said drawings:

Fig. 1 is a perspective view of a machine embodying my invention.

Fig. 2 is a vertical longitudinal section on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged vertical section on the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of the upper portion of the index-carrying tab, and,

Fig. 6 is a perspective view of the same portion of the tab and of the index card and holder, before assembly.

Now referring specifically to the drawings showing one embodiment of the invention, and in which similar reference numerals indicate like parts throughout the several views, the machine as here shown comprises a base 1, having side rails 2. A plurality of leaves 3 are positioned on edge on said base 1, each leaf being provided with an upstanding tab 4 at one end and a similar tab 5 at the other end. In the present embodiment of the invention I have

illustrated the use of only two tabs carried by the leaves, but the latter may be elongated and formed with three or more tabs if desired. It will be noted that the tabs 4 form a row A, and the tabs 5 a row B, extending longitudinally of the machine. Each leaf is also provided with a short narrow stub 6, extending in the same plane as the tabs 4 and 5, for a purpose to be hereinafter set forth.

The lower edges of the leaves rest upon the floor of the base 1, below the top of the rails 2, and each leaf is freely movable longitudinally of the rails 2 and of the base 1, one of the said rails limiting lateral movement of the leaves at the left. As will presently appear further means are provided for limiting movement of the leaves to the right.

The bottom edge of each leaf 4 is turned backwardly upon itself to provide a spacer element 7, separating each leaf from the leaf adjacent thereto, and also furnishing a rounded base for the leaves, facilitating sliding movement longitudinally of the upper surface of the base 1, and the tilting movement of the leaves during the sorting operation.

A front rail 8 and a rear rail 9 extend between and are secured to the ends of the side rails 2, and form a box-like structure adapted as a housing for the leaves and other instrumentalities hereinafter referred to. A movable platform 10 is hingedly connected at 11, 11 to the rear rail 9, the front end of said platform being equipped with bifurcated flanges 12 which straddle thumb screws 13 carried by the front rail 8 and adapted to detachably secure the platform 10 to said rail, in the position shown in Fig. 1. The platform 10 is also provided with a longitudinally extending slot 14, adapted to enclose the row of stubs 6, as clearly shown in Fig. 1, and with a vertically extending flange 15, adapted for contact of the papers inserted between the tabs 4, and to limit movement of said papers to the right.

Each leaf 3 is provided with an extension 16, integral with the tab 5, as clearly shown in Figs. 1 and 3. In the sorting operation, certain papers are placed between the tabs 4, and certain others between the tabs 5, the papers extending to the right of the tabs in the particular embodiment of the invention as here illustrated. The left-hand end of each paper is held between the tabs 4 or 5, and the right-hand ends of all papers placed between the tabs 4 are held between and supported by the stubs 6, and the extensions 16 similarly support the ends of the papers placed between the tabs 5. A table 17 is secured to the rails of the housing, and extends outwardly to the right of the machine, and is provided with a flange 18 which prevents forward movement of the papers placed in the row B, in front of the first tab 5. It will be understood that all papers placed between the tabs of the row A will rest upon the platform 10, and all papers placed between the tabs in the row B will rest upon the table 17.

It will be noted that each of the tabs 4 is provided at its top edge with a forwardly extending index holder 19, the front face of the holder being downwardly and inwardly inclined with respect to the body of the tab 4. The holder 19 is formed from a strip of thin metal which is bent at substantially a right angle, forming the sections 20 and 21. The upper section 20 is transversely cut to the point of juncture with the lower section 21, to provide three card-retaining strips 22, 23 and 24, leaving the free sections 20′ and 20″, on each side of the strip 23, except where joined to the section 21, as clearly shown in Fig. 6. The upper corners of the free sections 20′ and 20″ are turned downwardly, to permit of the insertion of an index card 25. In inserting said card the end is inserted beneath the strip 22 or 24, and the thumb of the operator presses downwardly upon the card 25 and also upon one of the free sections 20′ or 20″, and, the said section, being of spring metal, will flex under pressure and move away from the retaining strips 22, and the index card may be positioned under the strips 22, 23 and 24. Immediately upon removal of the pressure of the thumb of the operator, the free section 20′ or 20″ will resiliently return to normal position and clamp the index card 25 against the retaining strips.

In order to retain the holder 19 in proper position, ears 26, 26, are struck from the body of the tab 4 and are bent at an angle to the body thereof to receive the lower edge of the section 21. Also the top edge of the tab 4 is bent downwardly over and clamped upon the top ends of the strips 22, 23 and 24. To prevent movement of the holder 19, laterally of the tab 4, an ear 27 is struck from the metal of the tab and turned over into an aperture formed in the section 21.

It is to be understood that the holders 19 project from the top of the tabs 4 to approximately the same extent as the flanges 7 project at the bottom, and it is therefore clear that all of the tabs 4 will be held in parallelism. The tabs 5, being integral with the leaves 3, are of course retained in parallelism with respect to the tabs 4. The spaced position of the tabs 4, and the inclination of the holder 19, enables the operator to obtain a clear view of the index cards carried by the tabs.

In assembling the device the leaves are arranged in inclined position, the upper por-

tion of the tabs being the more distant from the operator. This further inclination of the tabs not only enables the operator to obtain a better view of the index cards 25, but also takes advantage of gravity in the restoration of any shifted leaves to normal position.

In order to limit forward movement of the leaves and to positively restore them from shifted position to normal, rearwardly-inclined position, I utilize integrally-connected pressure plates 28, 28′ which are fixed on a rod 29, extending across the front of the device and pivotally mounted adjacent the upper surface of the base 1. The plates 28, 28′ are of the same general shape as the tabs 4, of the leaves 3, the general arrangement being such that the plate 28 is directly in front of the first tab 4 in the row A, and the plate 28′ is similarly positioned with respect to the front tab 5 of the row B. The rod 29 is subject to the influence of a spring 30, which always exerts its tendency to press the plates 28 and 28′ against the adjacent tabs 4 and 5 respectively, or against any papers which may have accumulated in front of said tabs, the plate 28 contacting the index holder 19, if no papers are positioned in front thereof. Manifestly the spring may be differently disposed and accomplish the same result.

It will be understood that, during the sorting operation, many papers will be placed between adjacent tabs, and cause a pressure tending to separate said tabs. It is intended that the tabs shall separate as the spaces between them become filled, and to facilitate the separation I provide a rack bar 31 on each side of the device, mounted in a groove formed in the upper surface of the base 1. As clearly shown in Figs. 2 and 3, the teeth of the rack bar 31 are flush with the upper surface of said base 1. A slide 32, terminating at each end in an upward extension 33, is slidably mounted on and extends across said base 1, and is provided with a perforated ear 34 on each side. A shaft 35 extends through the perforations in the ears 34 and, on each side, carries a gear wheel 36 which meshes with the teeth in the racks 31, one end of the shaft 35 extending through a slot 37, formed longitudinally through one side 2 of the housing, and being equipped with an operating wheel 38. The other end of the shaft has bearing in the slide 32 and the side wall 2. The vertical extensions 33 are integral parts of the slide 32, and extend upwardly and bear against the rear tabs 4 and 5 respectively, retaining said tabs in proper position.

When the papers are sufficiently accumulated between the tabs 4 and 5, the operator turns the wheel 38 to the rear, causing rearward movement of the slide 2 and the extension 33, and permitting an expansion of the spaces between the tabs 4 and 5, the expansion being caused automatically by the papers being compressed between said tabs, or the operator may manually push backwardly any tab or tabs which are preventing the automatic expansion.

While the device so far described is capable of any classification sorting, the embodiment herein shown has been adapted, by the installation of the required indices, to the bank check sorting of a certain unit of the clearing houses for the regional banks of the districts of the State of Maryland. The clearing houses "clear" for the member banks of the Federal Reserve System, and also for the non-member banks, the checks being drawn on banks of both classes, and being sorted in accordance with the names of the banks upon which the checks are drawn. In some cases the sort may be effected on the device of the present invention by arranging them in accordance with the names of the banks, irrespective of their member or non-member affiliations, or they may be assorted as "members" and non-members".

Assuming that there are 104 banks which "clear" through the clearing house handling the unit referred to, there would be 52 of the leaves 3 provided, in the embodiment of the invention herein illustrated and described. This structure would provide a row of 52 of the tabs 4, and 52 of the tabs 5, and the indicia on each of the tabs 4 would contain the names of two of the banks of this particular unit of the system. If the sort is to be made without regard to the affiliations as "member" or "non-member" the arrangement of the indices on the cards 25 in the tabs 4 may be arbitrary, each card carrying the names of two banks, such as "Denton Nat'l." and "Essex Com.", respectively representing the National Bank of Denton, Maryland, and the Essex Commercial Bank of Essex, Maryland. In the sort, when a "Denton Nat'l" check is reached, the tab 4, bearing the index card 25 of that bank, is pulled forwardly and the check dropped in the space provided between the tabs 4 in the row A. Later, when an "Essex Com" check is reached, the same tab is pulled forwardly, and the check dropped between the opened tabs 5 in the row B. It is understood that the tabs 4 collectively bear a complete list of every bank in the particular unit which is cleared through the particular clearing house handling this sort. Consequently, when all of the checks are assorted, all checks drawn on the "Denton Nat'l" bank will have been collected in a compartment in the row A, between two adjacent tabs 4, and similarly, all checks drawn on the "Essex Com" will have been deposited in a compartment in the row B, between the tabs 5. In other words, all the checks drawn on all of the 104 banks in this

particular unit, will have been so distributed and collected, that all checks drawn on each of the banks are in separate compartments.

If it is desired to sort by "member" and "non-member" banks, the member banks will preferably be indicated at the left of the index cards 25, and the "non-member" banks at the right. All checks drawn on a "member" bank will then be deposited in the row A, and all checks drawn on a "non-member" bank will then be deposited in the row B. It will be noted that this particular scheme comprehends a double sort, in that all of the checks are not only collected into groups each containing only checks drawn on one bank, but that the "member" bank checks are all in row A, and the "non-member" bank checks are all in row B. There are numerous arbitrary methods of sorting which may be practiced with the device of which an embodiment is herein disclosed, as will be understood, and, as before stated, the number of classifications may be extended to include not only the rows A and B, but also as many additional rows as the particular work may require.

In the post office letter carrier sort to arrange the mail for house-to-house delivery, the indices 25 would carry the names of streets, buildings, etc. In the sort of the sales slips for department stores, the indices 25 would carry letters, words or numerals, to indicate the separate departments, or the type of goods sold, or the salesman's number. In the sort of measured service telephone slips the indices would carry the names of the several telephone exchanges.

From the foregoing it will be noted that I have provided what may be called normally-closed pigeon-holes which may be opened at the will of the operator, but which occupy a minimum of space, the device described being capable of holding 4000 checks and being only 18 inches wide and 16 inches long, occupying a very small proportion of the space which would be required for a "pigeon-hole" battery for the same bank unit sort.

The device closes the tabs automatically upon the release of any tab 4 which has been pulled forward to provide the necessary opening, since such pull is against the influence of the spring 30, which spring, assisted by gravity, immediately presses the plates 28, 28' against the front tabs 4 and 5 respectively, and immediately restores said tabs and all unshifted tabs in the row, clamping the checks therebetween.

As shown in Fig. 3, the platform 10, upon which the edges of the checks rest, is of such height relative to the tabs 4, that, when the lower edges of the checks are upon the platform the upper portion of the check is below the top of the tabs and hence does not in any way obscure the index cards 25 carried by the tabs. Movement of the leaves laterally of the device, in either direction, is prevented by the edges of the platform 10 and the sides 2. Vertical movement of the leaves is prevented by the platform 10. In order to more definitely limit such vertical movement however, I provide a bead 10' which is formed longitudinally in the surface of the platform 10, and extends downwardly to a point immediately above the top of the leaves when in the highest position of their pivotal movement. Obviously a stop-strip could be applied to the under surface of the platform if desired.

To facilitate the use of the device I have provided a check or paper holder comprising a downwardly inclined table 39 located at the front of the device between the rows A and B. The table 39 is detachably secured to the front rail 8 by means of an extension 40, provided with two apertures 41, 41, larger at the bottom than at the top. Said apertures are so formed that the lower portions fit over headed bolts carried by the rail 8. The table is then pushed downwardly and the bolts slide into the narrowed portions of said apertures, and detachably secure the table in position. Connected to the front edge of the table, is a vertically extending plate 42, as clearly illustrated in Fig. 1. In use the checks to be assorted are deposited face upwardly on the table 39, directly below the eyes of the operator, and are pressed inwardly towards said plate 42. The pressure results in the checks being "fanned" at their rear edge, greatly facilitating the work of the operator in removing a single check at a time for deposit in the appropriate space provided. The operator pulls the tabs 4 with the left hand, and with the right hand, deposits the checks between the appropriate tabs in the spaces provided.

While I have here shown the spacer elements 7 as an integrally formed flange, and while this is the preferred construction, it is obvious that other means may be carried by the leaves to maintain the desired separation thereof. It is also understood that the holders 19 for the index cards 25 may be provided by any suitable structure, so long as they clearly display the indices while the device is in operation.

In the sorting of small units it is of course possible to efficiently utilize a device such as described, but provided with only the row A of the tabs 4, in which case the index card 25 would contain only one designation of class. But in most of the class units to be handled the number of classifications is so great, and the articles to be deposited in each class so numerous, that a single row of tabs, if sufficiently long to hold the entire

lot of papers being sorted, would also be so long that the operator could not easily reach the tabs at or near the end of the row. Furthermore the device would be without certain of the advantages of the device described, in that, having only one row of tabs, the operator could not have the benefit of the variance in classification between separated rows.

It is of course understood that the leaves 3 may be removed as desired, or new leaves inserted. In such cases the thumb screws 13 are loosened and the platform 10 lifted on its pivots 11, and a leaf may be lifted out, or an additional leaf inserted.

Various modifications of the structure herein disclosed may be suggested to those skilled in the art, but my invention covers all embodiments falling fairly within the scope of the appended claims.

What I claim is:

1. A sorting device comprising a plurality of movable elements each provided with a plurality of tabs, the tabs of the several elements being arranged in a plurality of parallel rows, each element being provided with a plurality of sets of indicia, each set of which is classified in accordance with the classification of one of said rows, and means spacing each element of each row from the adjacent element in the same row.

2. A sorting device comprising a plurality of movable elements positioned on edge and arranged in a row, each element being provided with a plurality of tabs extending above the body portion of the element, means facilitating the operation of separating one tab from an adjacent tab in the row, and means for automatically restoring said tab to a normal position.

3. A sorting machine comprising a multiplicity of separator elements positioned on edge, each element being provided with a plurality of spaced tabs forming a plurality of rows, classification indicia carried by one of the tabs on each element, and a paper-receiving platform positioned between said rows.

4. A sorting device leaf provided with a plurality of laterally separated tabs, an integrally formed spacing projection formed on the lower portion of said leaf, and an index pocket carried by the top of one of said tabs.

5. A sorting device comprising a plurality of spaced elements postioned on edge in a row, each element comprising a body portion and a vertically extending tab, the tabs of adjacent elements being adapted to receive papers therebetween, and a platform mounted in position to support the ends of the said papers.

6. A sorting device comprising a plurality of spaced elements positioned on edge in a row, each element comprising a body portion and a vertically extending tab, the tabs of adjacent elements being adapted to receive papers therebetween, each element being mounted for movement longitudinally of said row, and means for limiting lateral and vertical movement of each element.

7. A sorting device comprising a plurality of spaced elements positioned on edge in a row, each element comprising a body portion and a vertically extending tab, the tabs of adjacent elements being adapted to receive paper therebetween, a platform covering said body portions and adapted to support the ends of the said papers, and means carried by said platform and adapted to limit lateral movement of said papers.

8. A sorting device comprising a plurality of spaced elements positioned on edge in a row, each element comprising a body portion and a vertically extending tab, the tabs of adjacent elements being adapted to receive papers therebetween, a platform covering the body portions of all elements in the row, and means carried by the platform and extending below the body thereof, adapted to limit vertical movement of said elements.

9. A sorting device comprising a multiplicity of spaced elements each comprising a body portion carrying a plurality of laterally spaced tabs forming parallel rows of tabs adapted to receive papers therebetween, a platform extending in parallelism with said rows of tabs and over said body portions, and a support for promiscuously arranged papers positioned at the front end of said platform.

10. A sorting device comprising a multiplicity of spaced elements arranged in a row and each mounted for movement longitudinally of said row, each element comprising a body portion carrying a plurality of vertically extending and definitely spaced tabs adapted to receive papers therebetween and forming parallel rows of tabs, and a platform extending over the body portion of said elements and between the tabs.

11. A sorting device comprising a plurality of elements positioned on edge in a row, each element comprising a body portion carrying a plurality of vertically extending tabs adapted to receive papers therebetween and forming parallel rows of tabs, and a pivotally mounted platform extending over said body portions between said tabs, and means for securing said platform against pivotal movement.

12. A sorting device comprising a plurality of elements positioned on edge in a row, each element comprising a body portion carrying a plurality of vertically extending sorting tabs and a vertically extending paper-supporting stub, and a platform extending over said body portions and between the rows formed by said tabs, said platform being provided with an elongated slot

adapted to pass over and surround the row formed by said stubs.

13. A sorting device comprising a multiplicity of spaced elements arranged in a row and adapted to receive papers therebetween, means contacting the front element and constantly urging the other elements backwardly in said row, means resisting such backward movement, and manually operable means for releasing said resistance.

14. A sorting device comprising a multiplicity of spaced elements arranged in a row, said elements being separately movable longitudinally of said row and adapted to receive papers therebetween, means constantly pressing against the front element of the row, a stop member bearing against the rear element and limiting rearward movement thereof, and means for moving said stop member longitudinally of said row.

15. A sorting device comprising a multiplicity of spaced elements arranged in inclined position in a row and adapted to receive papers therebetween, and a spring-pressed plate contacting the outer surface of the front element of said row, whereby to always return any moved element to its normally inclined position.

16. A sorting device comprising a multiplicity of spaced elements arranged in a row and adapted to receive papers therebetween, each element being mounted on its edge to permit pivotal movement, and being also movable longitudinally of said row, a spring-pressed plate constantly exerting its influence to pivotally shift the front element rearwardly, a member positioned against and limiting rearward body movement of the rear element longitudinally in said row, and means for moving said member out of contact with said rear element.

17. A sorting device comprising a plurality of separator elements arranged in a row, each member being separately movable longitudinally of said row, a stop member normally limiting rearward movement of said elements, and rack mechanism connected to said member whereby the latter may be moved in each direction longitudinally of said row.

18. A sorting device comprising a plurality of separator elements arranged in a row, each member being separately movable longitudinally of said row, a stop member normally limiting rearward movement of said elements, rack mechanism connected to said member whereby the latter may be moved in each direction longitudinally of said row, and means constantly pressing all the elements rearwardly in said row.

19. A leaf for sorting devices comprising a body portion and a plurality of laterally separated tabs extending therefrom, and a spacer abutment forming a part of the leaf.

20. A leaf for sorting devices comprising a body portion and a plurality of laterally separated tabs extending therefrom, and spacer abutments integrally carried by top and bottom portions of the leaf.

21. A leaf for sorting devices comprising a body portion and a plurality of laterally separated tabs extending therefrom, means carried by the leaf for spacing it from another leaf in juxtaposition thereto, and classification indicia carried by one of said tabs.

22. A leaf for sorting devices, comprising a body portion and a plurality of separated and variously classified tabs extending therefrom, and indicia carried by one of said tabs and denoting the classification of all the tabs.

23. A leaf for sorting devices, comprising a body portion and a plurality of separated tabs extending therefrom, classification indicia carried by one of said tabs, and means carried by the leaf and adapted to space it from a juxtaposed leaf.

24. A leaf for sorting devices comprising a body portion, an assorting tab extending from said body portion, and a paper-supporting stub extending from said body portion and located in the plane of said tab.

25. A leaf for sorting devices comprising a body portion, a plurality of spaced assorting tabs extending from said body portion, and a paper-supporting stub extending from said body portion and located between said tabs.

26. A leaf for sorting devices comprising a body portion, a plurality of spaced assorting tabs extending from said body portion, a paper-supporting stub extending from said body portion and located between said tabs, and a paper-supporting extension carried at the end of said body portion.

27. A leaf for sorting devices comprising a body portion carrying on its lower edge an integrally formed spacer element provided with a rounded bottom, a plurality of spaced vertically extending tabs carried by the upper portion of said leaf, and an index carried by one of said tabs.

28. A leaf for sorting devices comprising a body portion carrying on its lower edge an integrally formed spacer element provided with a rounded bottom, a plurality of spaced vertically extending tabs carried by the upper portion of said leaf, and indicia carried by one of said tabs denoting the classification of all the tabs.

29. An index holder for sorting tabs, comprising a body portion, resilient flanges connected at one edge to said body portion and extending at an angle thereto, parallel card-retaining clips connected to said body portion and extending in a plane above the plane of said flanges, and means for securing said flanges and body portion to said tab.

30. An index holder for sorting tabs, com-

prising a body portion, resilient flanges connected at one edge to said body portion and extending at an angle thereto, parallel card-retaining clips connected to said body portion and extending in a plane above the plane of said flanges, and means for securing said flanges and body portion to said tab, said means comprising upturned clips struck from the tab and supporting the bottom edge of said body portion, and a flange extending from the top edge of said tab and clamping said card-retaining clips.

In testimony whereof I affix my signature.

GEORGE W. COX, JR.