

July 1, 1924.

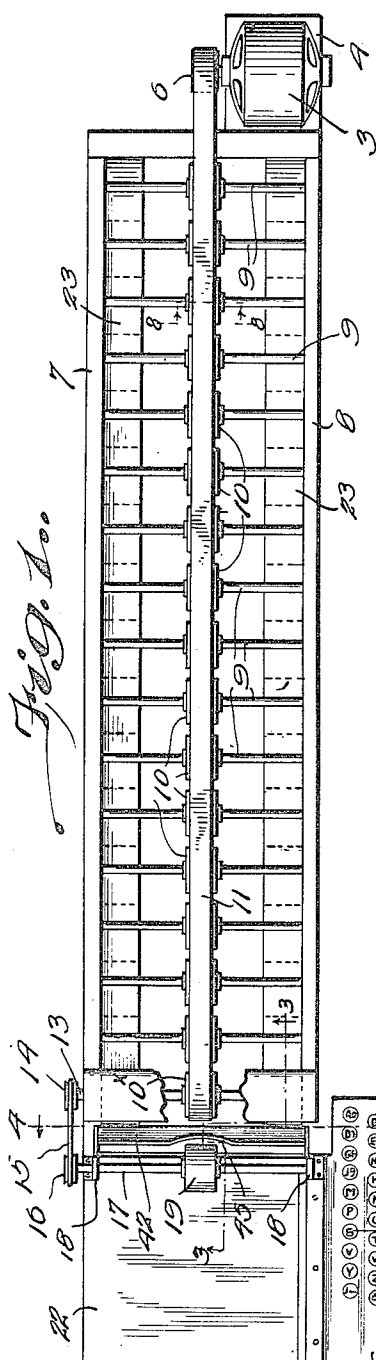
1,499,641

G. W. COX, JR

SORTING MACHINE

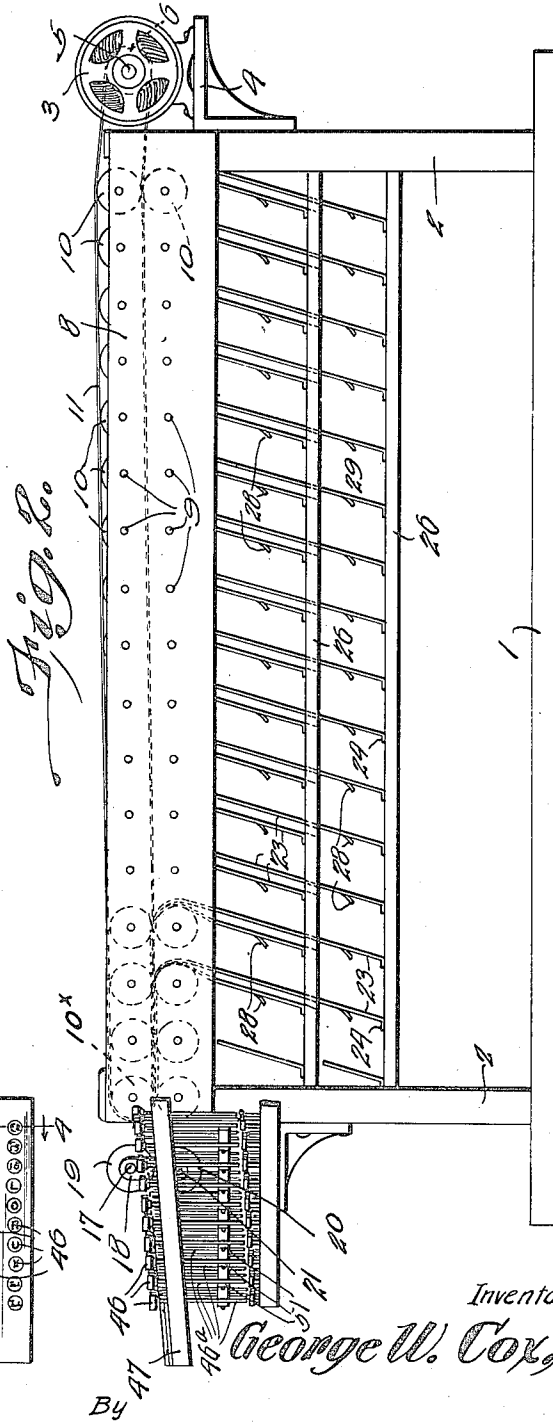
Filed July 20, 1920

5 Sheets-Sheet 1



Witness

[Signature]



By

[Signature]

Inventor

George W. Cox, Jr.

Attorney

July 1, 1924.

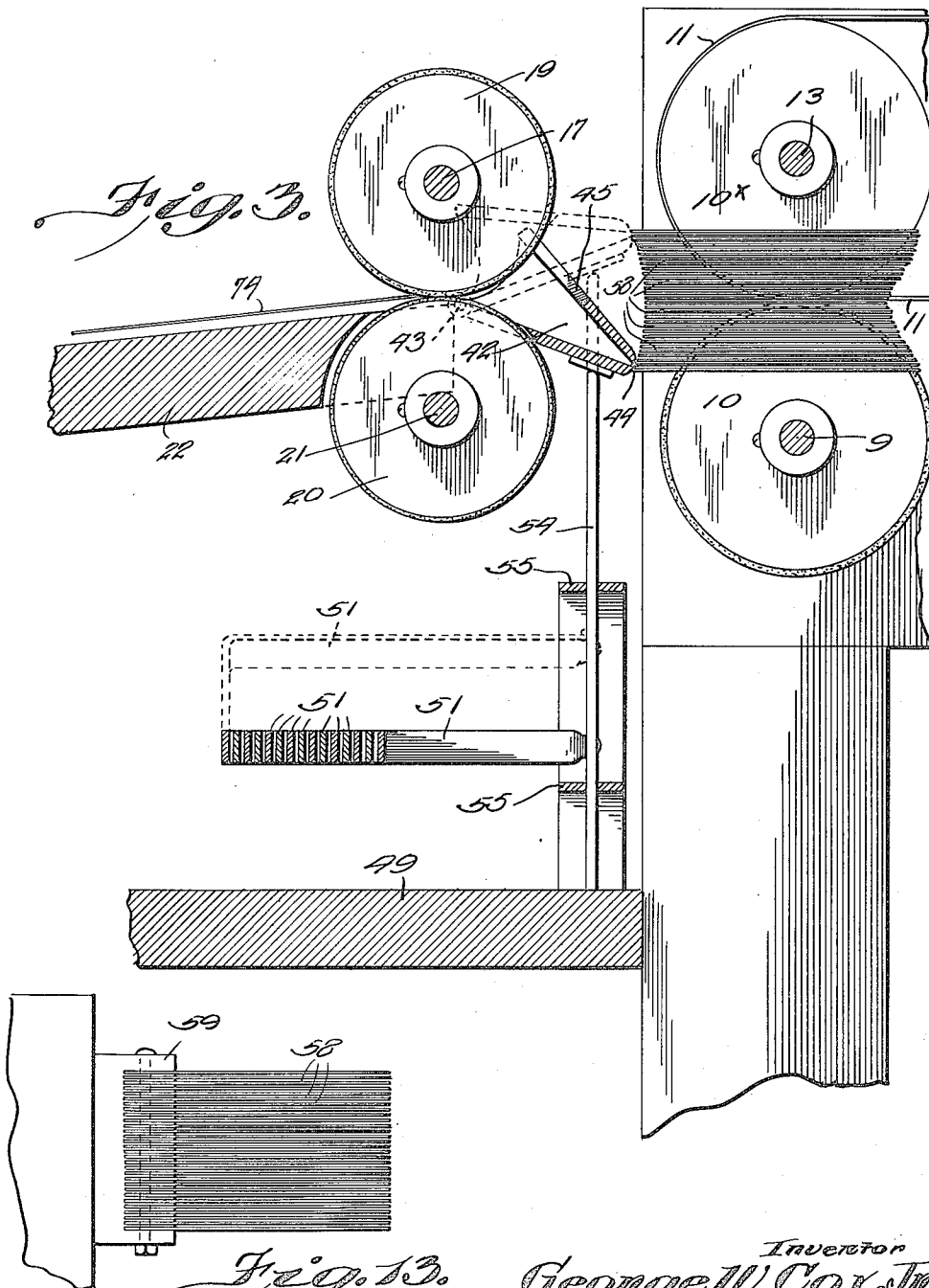
1,499,641

G. W. COX, JR

SORTING MACHINE

Filed July 20. 1920

5 Sheets-Sheet 2



Witness

[Handwritten signature]

Fig. 13.

By

Inventor
George W. Cox, Jr.
E. A. Bond
attorney

July 1, 1924.

1,499,641

G. W. COX, JR

SORTING MACHINE

Filed July 20, 1920

5 Sheets-Sheet 3

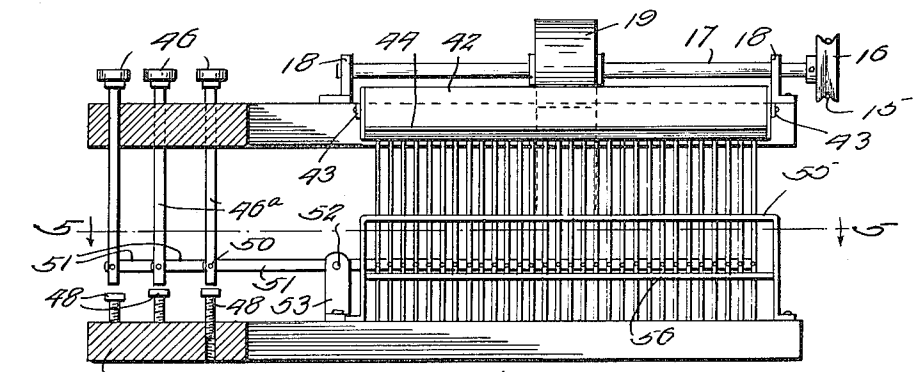


Fig. 4.

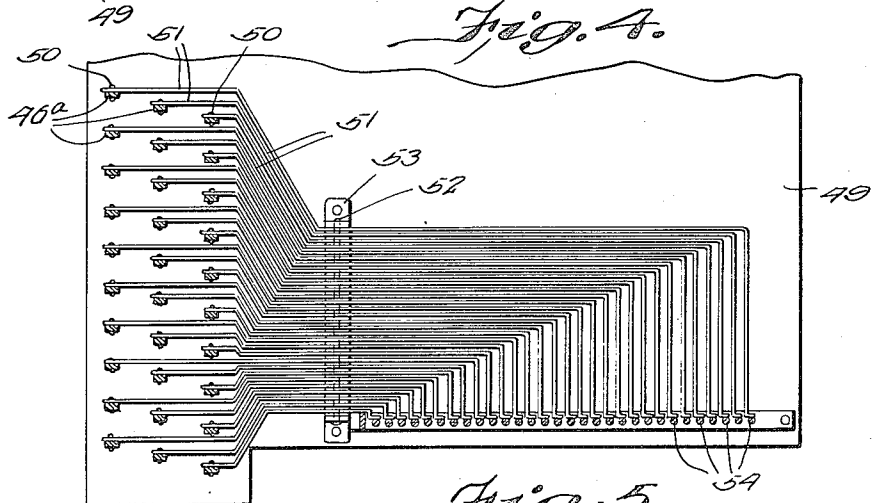
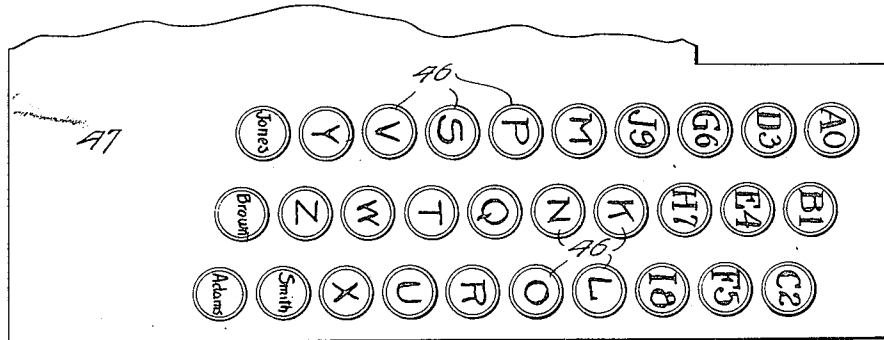


Fig. 5.



Inventor
Fig. G. Geongell Cox, Jr.

Witness

[Signature]

By

E. H. Bond Attorney

July 1, 1924.

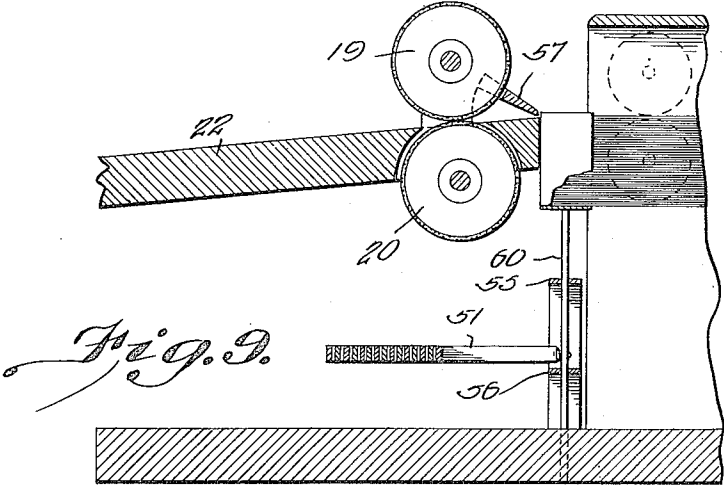
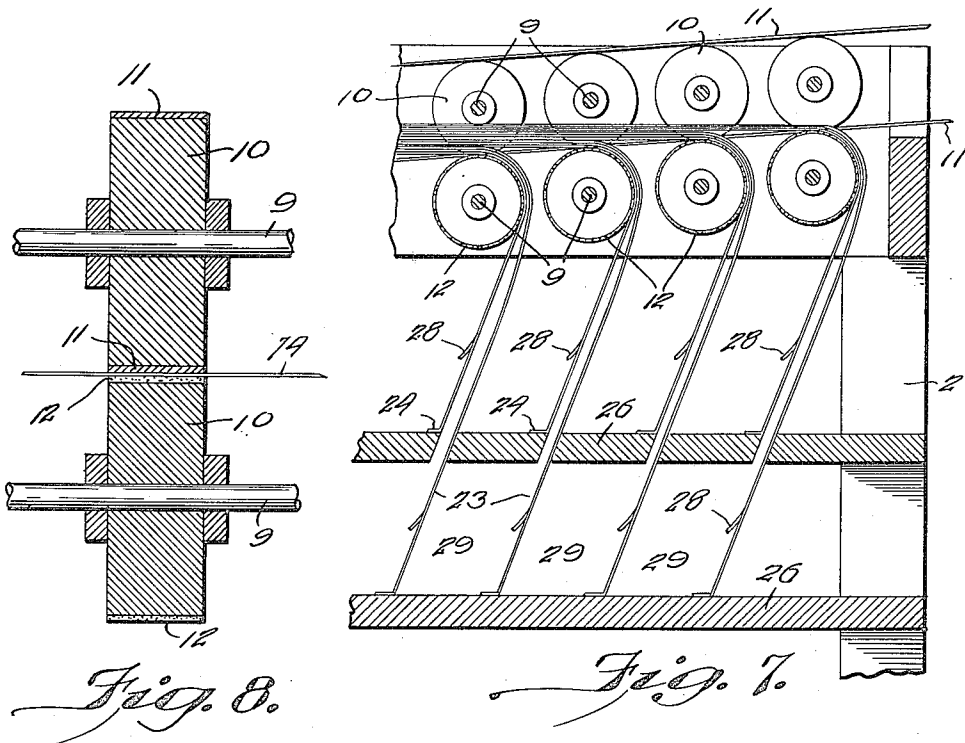
1,499,641

G. W. COX, JR

SORTING MACHINE

Filed July 20, 1920

5 Sheets-Sheet 4



Inventor
George W. Cox, Jr.

Witness
R. H. Kinschlag

By *E. M. Bond* Attorney

July 1, 1924.

1,499,641

G. W. COX, JR

SORTING MACHINE

Filed July 20, 1920

5 Sheets-Sheet 5

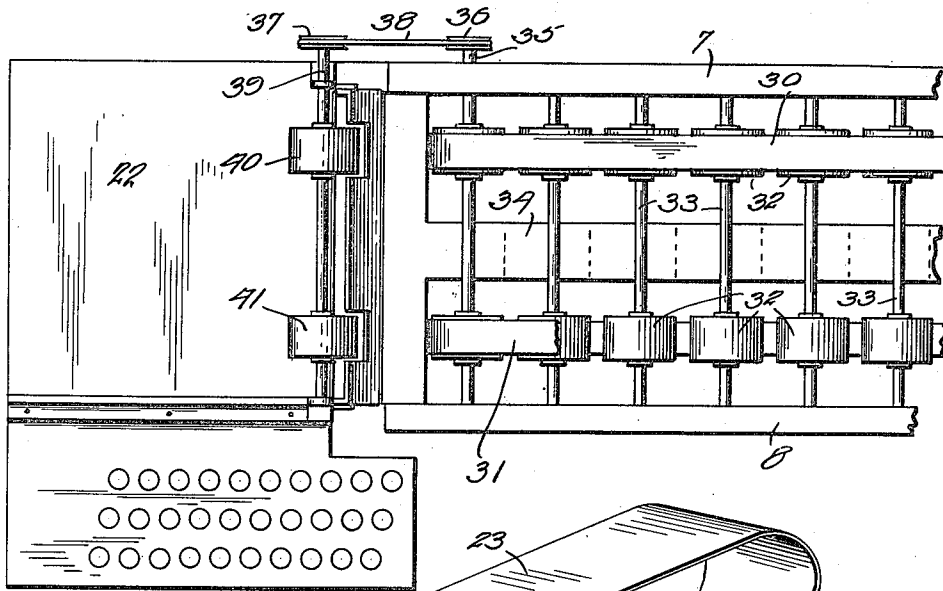


Fig. 10

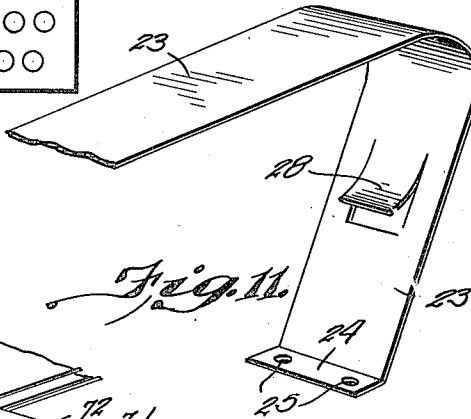


Fig. 11

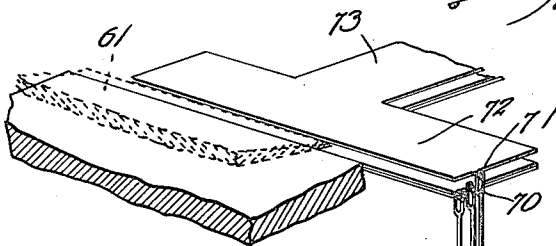
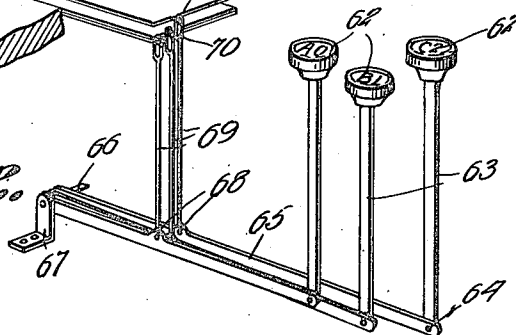


Fig. 12



Inventor
Georgell W. Cox, Jr.

Witness
[Signature]

By

[Signature] Attorney

UNITED STATES PATENT OFFICE.

GEORGE W. COX, JR., OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO NATIONAL ASSORTING COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF DELAWARE.

SORTING MACHINE.

Application filed July 20, 1920. Serial No. 387,761.

To all whom it may concern:

Be it known that I, GEORGE W. Cox, Jr., a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Sorting Machines, of which the following is a specification.

This invention pertains to means for sorting articles such as checks, sales slips, vouchers, coupons, car mileage slips, money orders, factory job cards, paper money, bonds, letters, bank deposit slips, and analogous articles, and it has for its objects, among others, to provide a simple and efficient machine for this purpose by means of which the checks, vouchers, slips, cards, or other articles, may be rapidly and accurately sorted by their serial numbers, letters, symbols or other indicia or designating characters.

It is a well known fact that in many offices, for instance, where large numbers of checks, sales slips, coupons, certificates, or other papers designated by serial number, or alphabetically, have to be sorted and arranged serially, or alphabetically, much time and labor are required in this sorting. For instance, in many offices of the United States Government, in offices of State governments, in many of the large department stores, and in many large offices and factories, thousands upon thousands and hundreds of thousands of such papers have of necessity to be sorted and arranged alphabetically or in accordance with their serial numbers, or into classes. In department stores and other places the sales slips and papers of like character are not only designated by a serial number or other indicating marks, but in many instances are also designated by class or book number, and in such cases it is necessary to not only sort the sales slips or other papers according to their serial number or their other indicating character, but the sales slips or other papers of each separate class or order. For instance, books numbers 1, 2 and 3, etc., have to be separated in groups, that is, all the sales slips or other papers of book 1, for instance, must be sorted by themselves, and all the sales slips or

other papers of, say, book 2 sorted by themselves, and so on.

My present invention has for its objects, among others, broadly, to provide a novel form of device by which these various sortings may be quickly and accurately accomplished, all by one and the same machine, and one and the same operator, the construction being such as not to require skilled labor in its manipulation.

The present invention has for a further object to provide a device of this general character which shall be simple in its nature, composed of few parts, and those readily assembled and not liable to derangement or injury and readily replaced should occasion require.

The device forming the subject-matter of this application will be particularly well adapted for use in banks, railroad offices, department stores, in the offices of auditors, and in fact anywhere and everywhere that there is occasion to sort and classify papers of this general character.

The present invention contemplates various forms of devices for accomplishing the desired end, which may be operated in various ways, dependent upon the conditions under which it is to be used, and it is to be understood that the machine may be equipped for operation on a large or small scale to accommodate the various requirements and the necessities of the office in which it is to be used. It is also to be understood that while in the present instance I have shown a machine designed for use for accomplishing the above ends, the same principle, and the mechanism generically considered, may be employed for carrying forward the invention, as will be made clear as the description proceeds.

My present device combines advantages of being rapid, accurate, labor saving, and also economical in the consumption of power and space required.

In some instances it may be desirable to sort all of the vouchers, cards, certificates, sales slips, or other papers or articles, by themselves, from the others, without arranging such slips or the like according to serial

number, or it may be desired to sort the papers into groups by letters or combinations of letters. This machine is equally well adapted for all such purposes.

5 Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

The generic principles of the invention 10 are capable of embodiment in a variety of forms some only of which are herein illustrated, those herein shown being what I at the present time consider preferable. It will be evident, however, that while the 15 forms herein disclosed and now to be described are what I at the present time consider preferable and have found efficient from practice, the same are subject to changes, variations, and modifications in detail, proportion of parts, relative arrangement, etc., and I therefore do not wish to be restricted in the appended claims to the particular construction or arrangement of 20 parts, etc., as herein disclosed, but reserve the right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

It is also evident that if desired the feeding device may be omitted, and the checks, 30 cards, papers or other articles fed into the selector or to the selected guide channel directly by hand.

Such changes as these I consider as coming fully within the scope of my present invention, provided the generic principle of 35 the same is employed.

My present invention, in preferred forms, is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this 40 specification, and in which—

Figure 1 is a plan view of a sorting machine constructed in accordance with my invention.

45 Figure 2 is a side elevation of the same.

Figure 3 is an enlarged vertical section on the line 3—3 of Figure 1 looking in the direction of the arrow.

Figure 4 is a vertical cross section on the 50 line 4—4 of Figure 1 looking in the direction of the arrow.

Figure 5 is a vertical cross section on the line 5—5 of Figure 4 looking downward.

Figure 6 is an enlarged detail, in plan, 55 of the keyboard.

Figure 7 is an enlarged vertical sectional detail showing the guide-channels and the receptacles or pockets for the sorted articles.

Figure 8 is an enlarged vertical cross section taken on the line 8—8 of Figure 1. 60

Figure 9 is an enlarged vertical longitudinal section with portions broken away, showing a modified form of means for selecting the entrance channel into which the 65 article is to be primarily fed.

Figure 10 is a top plan with portions broken away, showing a modified form in which two conveyor belts are employed, with a different arrangement of the channels. 70

Figure 11 is an enlarged perspective view with a portion broken away, showing the depositing terminal of one of the guiding members.

Figure 12 is a perspective detail with portions broken away and part in section, showing a still further form of means for selecting the entrance channel into which 75 the article is to be primarily fed.

Figure 13 is an enlarged detail showing 80 one form of supporting the channel members at their forward end.

Like numerals of reference indicate like parts throughout the several views.

Referring to the drawings, 1 designates 85 a suitable supporting base, from which rise the standards or uprights 2, although it is evident that the base may be omitted and the uprights or standards 2 secured to or supported from the floor or other suitable support, or the elements constituting the operative parts of the machine may be supported in any other desired manner. In 90 some instances it may be designed to rest directly upon a table or bench or the like.

Preferably, though not necessarily, the motive power employed generally will be a motor, preferably an electric motor, such as indicated generically at 3 in Figures 1 and 2, which may be mounted upon a suitable bracket or support 4, the shaft 5 of such a 100 motor carrying a pulley 6, in case a belt is employed, or a pinion or gear, should gear mechanism be employed in lieu of the belt, although the former is preferred, and the following description will be based upon the pulley and belt mechanism, although it is to be understood that the invention is in no wise restricted to this particular form of transmitting power from the motor. 110

With this understanding, 7 and 8 are two members constituting the sides of the machine in which are journaled the shafts 9, each of which, in the form shown in Figures 1, 2 and 4, carries a roller 10, and in this 115 form these rollers are shown as disposed substantially midway between the two side members 7 and 8, see Figure 1. These rollers, of which there may be any desired number, arranged equi-distant from each other, or substantially so, but as seen in Figure 2 the axes thereof instead of being arranged upon strictly a horizontal plane, are disposed upon a plane gradually inclined upward from the feed-end of the device toward the rear end thereof for a purpose which will hereinafter be made apparent. 120 11 is a belt passed over the pulley 6 on the shaft 5 of the motor and over the upper rollers 10, it being understood upon ref- 125

erence, say, to Figure 2, that these rollers are in pairs, there being an upper set and a lower set, as indicated in said Figure 2 as well as in Figure 7, and the belt as indicated in dotted lines in Figure 2 runs between the upper and lower sets of rollers.

The rollers 10 may be of any suitable character or material, but if from any cause it should be desired to increase the frictional contact between the lower rollers and the articles being fed or passed between such lower rollers and the belt, I may provide such lower rollers with a peripheral covering 12, which may be of felt, rubber, or any suitable material capable of accomplishing such purpose.

All of the rollers 10, with the exception of the one designated 10^x at the feed end of the machine, may be mounted either loosely upon their shafts and the latter fixed in their bearings, or the said rollers may be fast upon the shafts and the latter mounted to revolve in such bearings. The roller designated 10^x, however, is fast upon its shaft and the latter is mounted to rotate in suitable bearings, the said shaft 13 carrying at one end a pulley wheel or the like 14 around which passes a belt 15 which in turn passes around a similar pulley wheel 16 on a shaft 17 mounted to revolve in suitable bearings 18 and carrying a feed roller 19, see Figure 1.

20 is a cooperating feed roller mounted on a shaft 21 in suitable bearings and between which the articles to be sorted are designed to be fed.

These feed rollers are mounted at the feed-end of the device, in the present instance being shown as between the forward end of the members 7 and 8 and the adjacent end of a feed table 22, which latter, however, may be dispensed with if desired.

Between the feed rollers 19 and 20 and the adjacent upper roller 10^x and the lower roller 10, as seen best in Figures 1 and 3, I dispose what I choose to term a "selector" or "selective deliverer" by the manipulation of which, in a manner to be described, the article to be fed is delivered into the proper selected channel, to be thence fed forward and deposited in the proper pocket or receptacle. I have several means of thus selecting the proper channel through which the article is to be conveyed to its proper place of deposit, some of which will be described, but before taking up this portion of the mechanism it is thought best to describe the said channels and the manner in which they are formed, in order that a clear understanding of this part of the device may be had. Attention is now called to Figures 1, 2, 7 and 11. In the form of device illustrated in these views the members forming these guide-channels are disposed upon opposite sides of the machine with the con-

veyor belt disposed substantially centrally therebetween, but in another form which will be hereinafter more specifically explained the parts are practically reversed, that is, there are two conveyor belts with the members forming the channels disposed intermediate thereof.

In the form illustrated in Figures 1, 2 and 7 wherein the members forming the guide-channels are disposed upon opposite sides of the conveying belt these channels are formed between strips, which may be of any suitable material, the general character of each of which is clearly shown in Figure 11, wherein 23 designates one of said strips having at one end a flange or lug 24 with openings 25 for the reception of screws or analogous means by which such ends, the lower ends, may be secured to the longitudinal supporting members 26 shown in Figure 2. The other ends may be secured in any suitable manner at the forward end of the machine. It is to be understood that in this form these members 23 are relatively fixed, whereas in the form soon to be described the front ends of these members 23 are mounted for vertical movement. These strips or members 23 are disposed one above the other, as seen clearly in Figures 3 and 7, each being curved, as seen at 27, see particularly Figures 7 and 11, such curvature being substantially upon the same arc as that of the lower rollers 10, as seen in Figure 7, and in substantially but not quite the same transverse plane as will also be seen in Figure 7, so that the articles being fed, as they pass over the lower rollers, will be carried thereby into the channels beneath the said rollers from which they drop into the pockets or receptacles therebeneath as soon as they are released by the said lower rollers.

As will be understood upon reference to Figure 7, while these strips or members are arranged in pairs, the lower strip forms the floor of one channel while the next higher strip or member which forms the top member of such channel constitutes the floor or lower member of the next adjacent channel, and so on throughout the series from the feed-end of the device toward the other end. As will be evident, the number of strips decreases from the feed-end of the device toward the other end by two, as each succeeding set of rollers 10 is reached, so that the end farthest from the feed-end of the device there will be but two strips, as will be clear upon reference to Figure 7. It will be understood that in this description reference is made to the number of strips upon each side of the machine. It is on account of this disposition of the members constituting the guide channels that the axes or shafts of the rollers 10 are arranged in an inclined position or plane instead of horizontally, so that the entrance ends of the

channels shall come in alignment with the upper sides of the lower rollers. By this arrangement the articles being fed are carried along and deposited in their proper pockets or receptacles, such pockets or receptacles being determined by the selection of the proper channel into which they are fed by means which will soon be described.

While in some instances it makes no difference how the articles fall into their pockets or receptacles, yet in the sorting of checks or other papers where it is desired to keep them when sorted in their alphabetical or numerical order and hence desirable that the checks or other papers fall into their pockets flatwise, face downward, I provide each member 23 at its terminal portion which constitutes the guide down which the article is delivered to its pocket with a deflector 28, shown in enlarged view in Figure 11, and also seen in Figures 2 and 7. This may be provided in any suitable manner, in the present instance in Figure 11 being shown as stamped out from the terminal portion of the member 23, and curved forward, or toward the feed-end of the device. By this means the paper or other article which is fed forward through the channel and released from the lower roller, in sliding down the inclined portion of the member 23, when striking this deflector, is shot forward as it were, so that it will fall flatwise into its pocket, and is thus prevented from dropping endwise, where it would interfere, most likely, with the proper falling of the next succeeding article in said pocket. It will be understood, however, that such provision is not necessary in cases where the mechanism is in a position at right angles to the one herein shown, that is where the articles would be fed vertically, in which case they would fall properly into their pockets. It will be understood that in this latter case where articles would be fed from the top and delivered at the side such articles would not be mechanically turned over in the course of their passage through the machine and hence would naturally fall in the proper position, it being understood that in the arrangement herein shown the checks or other articles are mechanically turned, that is, they are fed in horizontally, or substantially so, and after they are gripped by the lower rollers they are turned by frictional engagement between the advancing faces of such rollers and the adjacent members 23 so as to be brought into a vertical or substantially vertical position and then slide down the inclined faces of the terminals of such members.

29, Figures 2 and 7, designates the pockets. These are formed by the members 26, forming the bottoms of the said pockets, which, as will be understood by reference to said Figures 2 and 7, are arranged in

tiers one above the other, while the front and rear ends of these pockets at opposite sides of the machine are formed by the members 23, as will be clear upon reference to Figure 7, the opposite ends of the pockets being preferably open.

In the form hereinbefore described the checks or other articles in their passage through the machine rest only at their ends upon the members 23, the belt or other propelling means engaging the said checks or articles between such ends. It is evident, however, that the principle of the invention will not be deviated from by a reversal of such construction. In Figure 10 I have shown such a reversal. In this form I employ two belts 30 and 31, one near each side of the machine between the members 7 and 8, these belts passing over the rollers 32 on the shaft 33 arranged and operated in all respects the same as in the other form, but between these two belts I dispose the members 34 forming the channels, these being disposed the same as in the other form except there is only one set intermediate of the two bands instead of two sets one upon each side of the intermediate band or pulley. The function, however, is substantially the same, it being understood that the members 34 are secured and bent the same as in the form shown in Figures 1, 2 and 7, and the members 34 are provided with suitable deflectors for the same purpose as the deflectors 28 hereinbefore referred to and shown in Figure 11.

In the form shown in Figure 10 the shaft 35 of the roller adjacent to the feed-end carries a pulley 36 around which and a similar pulley 37 passes the drive belt 38. The shaft 39, carrying the pulley 37, is provided with a pair of feed rollers 40 and 41 in alignment with the two pulleys 30 and 31 for an obvious purpose. The shaft 38 is mounted in suitable bearings and the operation is the same as in the form shown in Figure 1.

It is to be understood that in the form shown in Figure 10 pockets are provided similar to those in the form shown in Figure 7, and to all intents and purposes the machine is the same.

Selection of the entrance channel into which any check or other article may be fed may be accomplished in a variety of ways. One form is clearly illustrated in Figures 1 to 6 inclusive. Upon reference to Figure 3 there will be seen a selector 42 pivotally mounted as at 43 on the end of the feed table 22, or in any other manner when such feed table is not present. This selector comprises a receptacle having a restricted delivery mouth 44 from which the article is passed into the selected channel. The upper wall of this selector in the present instance is shown as cut away at 45,

see Figures 1 and 3, so that when the selector is thrown upward, as indicated in dotted lines in Figure 3, this cut away portion receives the adjacent portion of the upper feed roller 19. This selector is manipulated by means of keys 46 upon a keyboard 47, each key designed to throw the selector into position so that the check or other article may be delivered to one of the channels hereinbefore described. The selector 42 is adapted for movement into as many positions as there are guide-channels in the machine. As the operation is the same for throwing this selector into any one of the numerous positions, a description of the means and mode of operation for throwing it into one of such positions is deemed sufficient. Taking, therefore, one of the keys 46, the shaft 46^a of which is controlled in its movement downward by means of an adjustable stop member 48, as seen clearly in Figure 4, this member 48 being adjustably mounted in the base or support 49, depression of this key which near its lower end is pivoted as at 50 to the outer end of the member 51, fulcrumed at 52 on a lug or the like 53 as seen in Figure 4, serves to elevate the corresponding rod 54, see Figure 3, which is designed to be moved through suitable guides 55 and 56, as shown also in said Figure 3, and when in its lowermost position is supported upon a suitable portion of the base 49, as seen in Figure 3, elevation of this rod 54 moves the selector 42 upward so as to bring its delivery mouth in alignment with the selected channel. In this instance, Figure 3, the selector is shown as being thrown to its uppermost limit, so that the check or other article will be delivered into the uppermost channel. The other keys are arranged so as to have less movement so that the selector is thrown a correspondingly less distance upward. As shown in Figure 6 the keys are provided with suitable designating characters for convenience of the operator. As will be understood upon reference to Figures 3, 4 and 5 each member 51 is connected with its appropriate rod 54, and while the arrangement of parts shown in Figure 5 is what I have found to be a convenient one for economy of space, etc., it is to be understood that such an arrangement is not essential, and the members 51 need not be bent as therein shown. The dotted lines in Figure 3 represent the member 51 corresponding to the rod 54 shown elevated in dotted lines in Figure 3.

Under some conditions it may be found desirable to maintain the selector in fixed position and to move the channels into operative relation therewith. This I should consider a practical reversal of the arrangement just described, and in Figure 9 I have illustrated one manner of effecting such change. In this view 57 is the selector

which instead of being pivoted as in Figure 3 is relatively fixed and the ends of the members constituting the channels are designed to be moved vertically bodily, this being readily permitted by means of the flexibility of the members constituting such channels. When this form is employed the forward ends of the members 58 constituting such channels are supported in a block or member 59 mounted for freedom of movement vertically, and for this purpose I employ the same sort of keyboard and connections as hereinbefore described in reference to Figure 3, 60, Figure 9, being the equivalent of the rod 54 in Figure 3, and all of the corresponding parts including the pivoted members 51, etc., being the same, and each key depressible in the same manner and connected up in the same way as in the form where the selector is moved, but as before stated in this form, Figure 9, the forward ends of the members 58 constituting the guide channels are moved relatively to the selector instead of vice versa. Depression of the one key moves the block 59 with its attached ends of the channel members 58 into the desired position with relation to the selector, and when pressure is released from the key after the paper has been fed through such channel, the parts return to their normal position by gravity, or by the flexibility of the material constituting the channel members.

In Figure 12 I have shown how this same result can be accomplished by another different arrangement of parts. In this form the selector 61 is relatively fixed and the members forming the guide-channels are movable in relation thereto, but instead of all of the guide-channel members being raised bodily simultaneously, I arrange to move only the desired one and those below it. This is accomplished in the following manner, it being understood that while in Figure 12 this particular part of the mechanism is shown in connection with the centrally disposed guide-channels of Figure 10, it is equally as well applicable to the form shown in Figure 1 where the channels are shown upon opposite sides of the centrally disposed propelling belt, it being only necessary to correspondingly connect up the different parts. In said Figure 12 each key 62 has its key shaft or shank 63 pivotally connected as at 64 with a member 65 fulcrumed as at 66 on a suitable support 67 and intermediate its ends having pivotally connected therewith as at 68 the vertical rods 69 the upper end of which is provided with a vertical elongated slot 70 in which is movably received and guided a laterally projecting pin 71 extending from the end portion 72 of the channel member 73. Each key is thus connected with a channel member and a depression of any one key depresses the corresponding channel member and all those be-

low it, leaving the depressed top channel member in aligned position with the outlet of the selector so as to receive and guide the check or other article passed through such selector. The result accomplished in all of these different forms is the same.

With the parts constructed and arranged substantially as hereinbefore described, and with the understanding that the various forms of arrangement of channel members, etc., as well as of the means of selecting the channel through which the article is to be guided, the operation, briefly stated, is as follows:

Referring first to the construction shown in Figures 1, 2, 3 and 7, a check or other article 74 is placed on the table 22 (or, in the absence of a table and feed rollers, into the mouth of the selector), and the motor being started, the check or other article is passed between the feed rollers 19 and 20, the operator in the meantime determining into which channel the check or other article is to be fed, and the corresponding key operated. Supposing it is desired to sort serially and the number it is necessary to select is 7, the key 7 is depressed, which through the shaft 46^a, member 51, and the rod 54, elevates the selector 42 so that its discharge end is in proper alignment with the guide channel corresponding to the receptacle designed for the reception of papers bearing the digit 7, when the check or other article has been fed through the feed rollers and through the selector into the selected channel it is taken up by the conveyor belt, and the adjacent lower roller, and carried forward between the belt and the lower rollers until it is brought to the delivery end of its channel, and when the forward end of such check or article is grasped by the roller corresponding to the channel which is to deliver the said check or article to its appropriate pocket it is released by the adjacent roller and later released entirely from the action of the belt when it is free to fall by gravity down upon the terminal of the channel member, either into the upper compartment or pocket or the lower compartment or pocket for which it may be destined, and as it comes in contact with the deflector 28 it is guided forward or in a direction contrary to that in which it has been propelled by the belt, so that in falling into the compartment or pocket it is brought into a horizontal position, face downward, it being understood that in its passage from the feed rollers to this pocket the check or other article has been turned bodily by the mechanical means hereinbefore described. The next check may be one to go into the pocket corresponding to digit 2; the corresponding key is depressed, and the same operation is repeated, and the check or other article travels a less distance and

is deposited in the receptacle corresponding to the selected channel. In the movement of all of these checks or other articles the latter are guided by these channel members and by reason of the bends 27 therein are bodily changed in direction as hereinbefore referred to.

The machine as hereinbefore described is unlimited in its capacity when operating upon thin or flexible articles. For instance, after having sorted all of the checks or papers in the manner just described, say, according to the first righthand digit, they are again passed through the machine and sorted to the next to the extreme righthand digit. As the operator comes to those checks or papers which have less than two digits in the number these checks or papers are caused to pass into any selected pocket or receptacle other than from 0 to 9, and thus eliminated for the time being, the sorting thereof being completed. After the passage of the checks or papers through the machine, selected in accordance with the next to the righthand digit they are again passed through the machine and the checks or papers having only two digits in the number are likewise ejected or caused to pass into another pocket or compartment, and so on until all the checks or papers have thus passed through the machine, when they will be found to be in their proper sequence or order in the compartments in which they have been deposited. Of course it will be understood that when any one pocket or compartment becomes filled the checks or papers can be removed and placed upon a shelf or other support and the next lot placed in proper order thereon, and so on.

The operation is the same in all forms whether it be that shown in Figures 1, 2 and 7, with any one of the form of selector mechanisms above described, or whether it be that form shown in Figure 10, with the form of selector mechanism shown in Figure 12, or that of Figure 3, or that of Figure 9.

Sorting alphabetically, or according to family names, such, for instance, as Brown, Jones, Adams, Smith, etc., is accomplished in substantially the same manner. For instance, in sorting out a multiplicity of papers, I first might eliminate, at once, all those bearing the names Adams into one receptacle, the Brown's into another, Jones into another, and so on, while sorting other names to the first letter of the names. Thus on the first sorting I would eliminate, by at least the family name, a large percentage of all the papers. Then of the remainder I could sort according to the letter following the first letter of the family name, and at this second run through the machine eliminate still other groups of family names, and so on; or I could sort by any other desired method, the result accomplished being

substantially the same as that above described in connection with numbered papers, the final assortment bringing together all the papers under each appropriate designation.

With reference to Figure 6 it will be seen that the first ten keys are designated not only by the digits 0 to 9, but also by the letters from A to J. By this means the same keys may be employed for sorting serially from zero to a billion or more, but also when sorting according to vowels or letters, the lettering of the keys being continued through to Z, and then in addition as many keys as may be desired designated for use in sorting according to family or special names.

Attention is called to the fact that a machine constructed as above described is capable of sorting original papers of varying sizes and thicknesses with certainty and uniformity of result. The same machine will sort papers of varying sizes and thicknesses from tissue paper to thick cardboard and of any size within the minimum or maximum dimensions of the structure itself.

It will also be noted that by my improvement all preparatory steps such as punching of holes or notches in the cards or anything of like character is unnecessary.

What is claimed as new is:

1. In a sorting machine, a plurality of receptacles, conveyor elements extending longitudinally over the receptacles, guide members having a portion extending in substantial parallelism with said elements and thence directed towards said receptacles, a selector adapted to deliver an article to any of said members, and means for feeding the article to said selector.

2. In a sorting machine, a plurality of receptacles, conveyor elements extending longitudinally over the receptacles, guide members located in pairs, one on each side of said elements and extending in substantial parallelism with said elements, and thence directed downwardly toward said receptacles, a selector adapted to deliver an article to any pair of said members, and means for feeding articles to said selector.

3. In a sorting machine a plurality of receptacles, belt actuated, article conveying rollers extending longitudinally over the receptacles, article guiding means leading to the receptacles and having portions extending to the front of the machine, a selector mounted at the front of the machine and adapted to deliver articles to any of said article guiding means, and feed mechanisms adapted to deliver articles to said selector.

4. In a sorting machine, a plurality of receptacles, conveyor elements extending longitudinally over the receptacles, guide members having a portion extending in substantial parallelism with said elements and

thence directed towards said receptacles, a selector adapted to deliver an article to any of said members, said selector and the entrance to said guide members being relatively movable, and means for feeding articles to said selector.

5. In a sorting machine, a plurality of receptacles, conveyor rollers arranged in alignment and extending over said receptacles, guide members leading to each receptacle and having a portion extending in parallelism with said rollers, means for rotating said rollers, a selector, and means for feeding articles to said selector.

6. In a sorting machine, cooperating rollers and belt for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels.

7. In a sorting machine, cooperating rollers and belt for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels, said selector mechanism and entrance to the guide channels being relatively movable.

8. In a sorting machine, cooperating rollers for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels.

9. In a sorting machine, cooperating rollers for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels, said selector mechanism and entrance to the guide channels being relatively movable.

10. In a sorting machine, cooperating rollers and belt for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels, said selector mechanism and entrance to the guide channels being relatively movable, said guide channel members being curved adjacent to said rollers.

11. In a sorting machine, cooperating rollers and belt for conveying an article, guide channel members cooperatively ar-

5 ranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels, said selector mechanism and entrance to the guide channels being relatively movable, said guide channel members being curved adjacent to said rollers and arranged in pairs.

10 12. In a sorting machine, cooperating rollers and belt for conveying an article, guide channel members cooperatively arranged with relation thereto, said rollers being arranged in progressive series to convey the articles through the channels, and a selector mechanism arranged for cooperation with the guide channels, said selector mechanism and entrance to the guide channels being relatively movable, said guide channel members being curved adjacent to said rollers and arranged in pairs, a member of one pair serving in conjunction with a member of the adjacent pair.

15 13. In a sorting machine, a multiplicity of substantially horizontal guide channels each terminating in a substantially vertical channel, and conveying means common to all of the vertical channels for conveying articles thereto.

20 14. In a sorting machine, a multiplicity of horizontal guide channels each terminating in an independent substantially vertical delivery guide channel, and means common to all the channels for conveying articles thereto.

25 15. In a sorting machine, a multiplicity of horizontal guide channels each terminating in an independent substantially vertical delivery guide channel, and means common to all the channels for conveying articles thereto, said conveying means extending continuously and over all of the vertical channels.

30 16. In a sorting machine, a multiplicity of horizontal guide channels each terminating in an independent substantially vertical delivery guide channel, means common to all the channels for conveying articles thereto, said conveying means extending continuously and over all of the vertical channels, and rollers operating in conjunction with said conveying means and having their axes disposed upon a plane gradually inclined upward from the feed-end of the device toward the rear-end thereof.

35 17. In a sorting machine a plurality of receptacles, endless conveying means extending over said receptacles, guide channel members, feed mechanism, and a movably mounted manually operated selector independent of said feed mechanism and interposed between the same and said channels.

40 18. In a sorting machine, conveying means and guide channel members, rollers

cooperating with said means and members, 65 and a manually operated selector in cooperation with the guide channel members and means whereby the selector is movable for selection of the proper channel, and feed mechanism independent of and between 70 which and the entrance to the said channels said selector is disposed.

19. In a sorting machine, conveying means and guide channel members, rollers cooperating with said means and members, a feed 75 mechanism, and a manually operated selector in cooperation with the guide channel members, said selector being independent of the feed mechanism and interposed between the same and said channels, and key operated means whereby the selector is movable 80 for selection of the proper channel.

20. In a sorting machine, conveying means and guide channel members, rollers cooperating with said means and members, 85 and a selector in cooperation with the guide channel members, and key operated means whereby the selector and channel members are relatively movable for selection of the proper channel, and feed mechanism independent of said selector and between which 90 and the entrance to the said channels said selector is disposed.

21. In a sorting machine, a substantially vertical guide channel member having at its 95 upper end a curved portion, combined with a roller mounted adjacent to and cooperating with said curved portion.

22. In a sorting machine, a substantially vertical guide channel member having at its 100 upper end a curved portion, combined with a roller mounted adjacent to and forming a portion of said curved portion, and a deflector disposed intermediate said curved portion and the lower end of the member. 105

23. In a sorting machine, a multiplicity of rollers in vertically disposed pairs having their axes disposed in a plane gradually inclined upward from the feed-end of the machine, combined with feed channels having curved portions conforming to said rollers, and a belt movable over the upper rollers.

24. In a sorting machine, a multiplicity of rollers in vertically disposed pairs having their axes disposed in a plane gradually inclined upward from the feed-end of the machine, and a belt movable over the upper rollers, combined with a plurality of channels having depending portions, the upper 110 ends of which are upon a curvature of substantially the same arc as that of the lower rollers.

25. In a sorting machine, a pair of feed rollers, and a manually operated selector 125 pivotally mounted with its receiving end adjacent said rollers.

26. In a sorting machine, a pair of feed

rollers, and a manually operated selector pivotally mounted with its receiving end adjacent said rollers, said selector having a restricted delivery mouth.

5 27. In a sorting machine, a pair of feed rollers, a manually operated selector pivotally mounted with its receiving end adjacent said rollers, said selector having a restricted delivery mouth, and a multiplicity
10 of channels into the selected one of which the article is fed.

28. In a sorting machine, a movably

mounted manually operated selector having a restricted delivery mouth.

29. In a sorting machine, a pivotally 15 mounted manually operated selector having a restricted delivery mouth.

30. In a sorting machine, a pivotally mounted, manually operated selector.

31. In a sorting machine, a movably 20 mounted manually operated selector.

In testimony whereof I affix my signature.

GEORGE W. COX, JR.