

Dec. 6, 1949

J. G. MACKECHNIE, JR

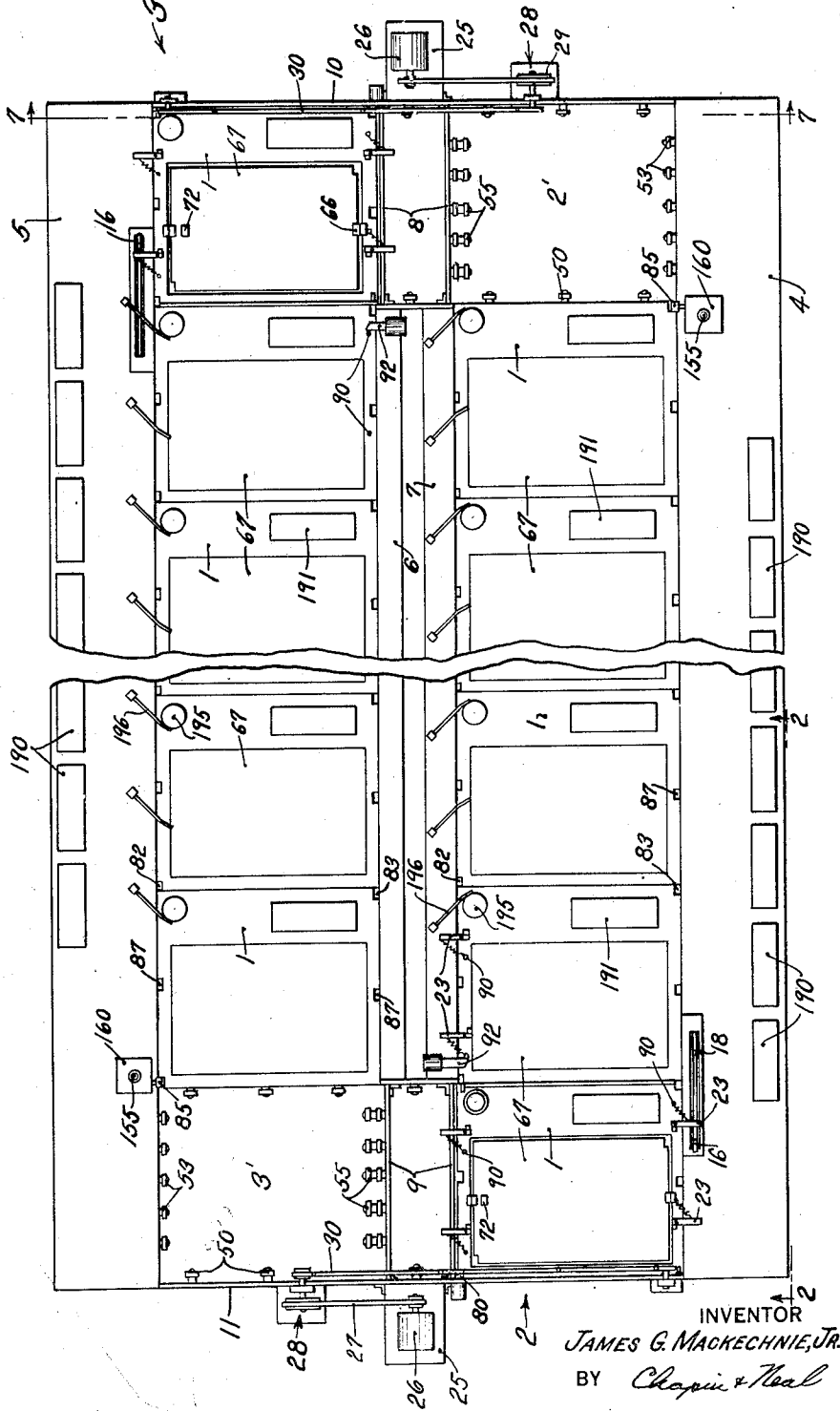
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LAUNDRY SORTING APPARATUS

Filed June 28, 1947

8 Sheets-Sheet 1

Fig. 1.



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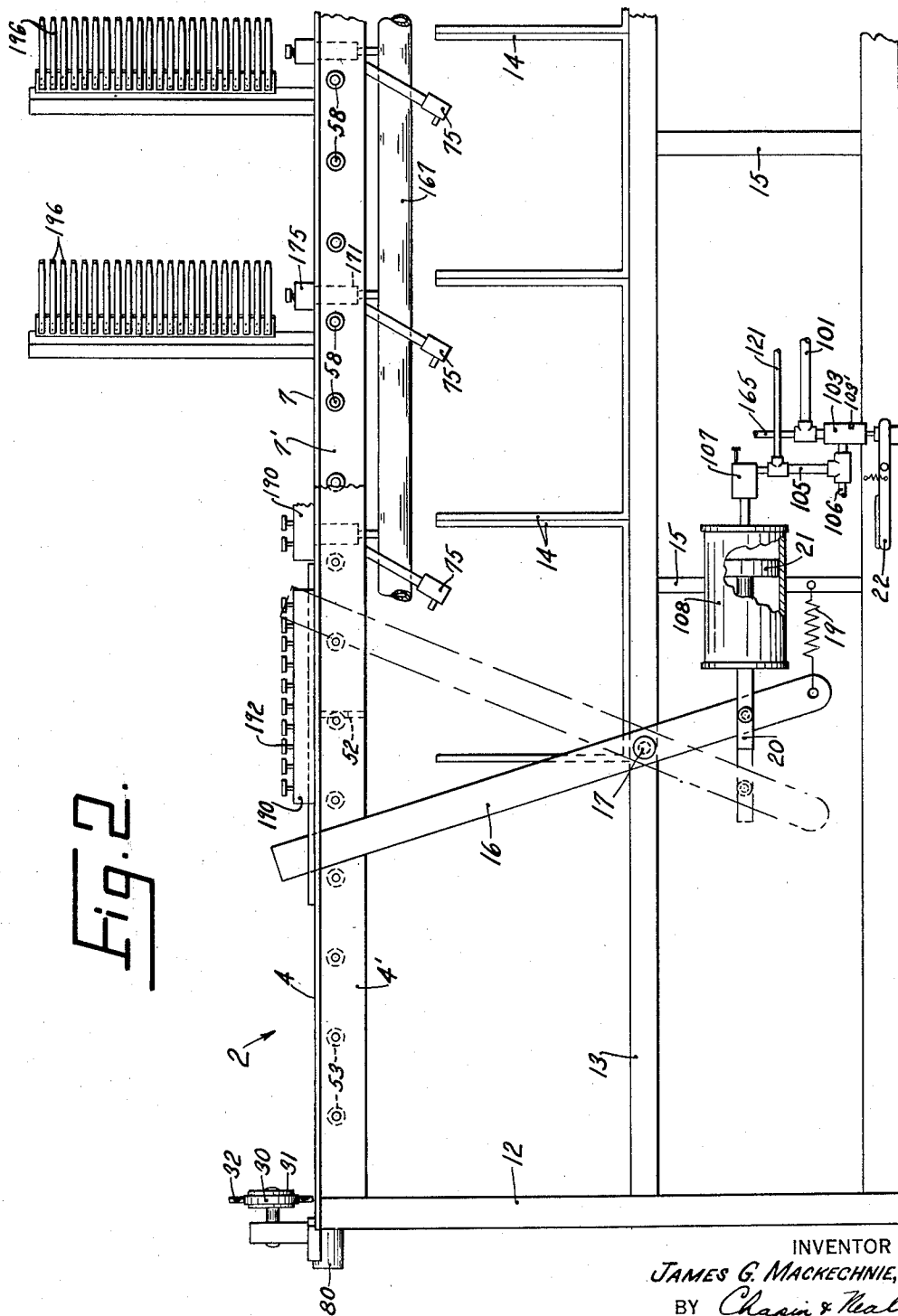
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8 Sheets-Sheet 2



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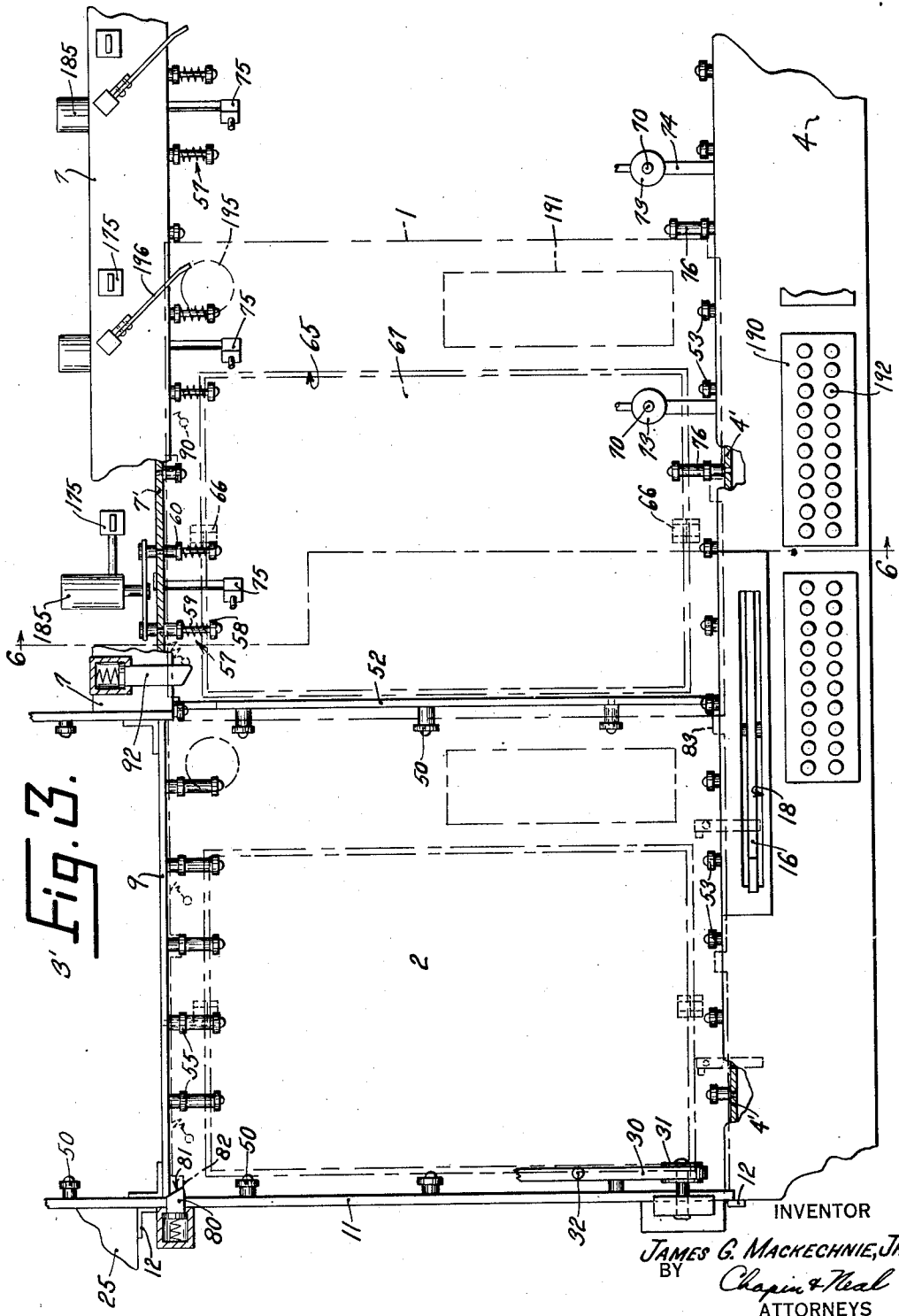
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Fig. 4.

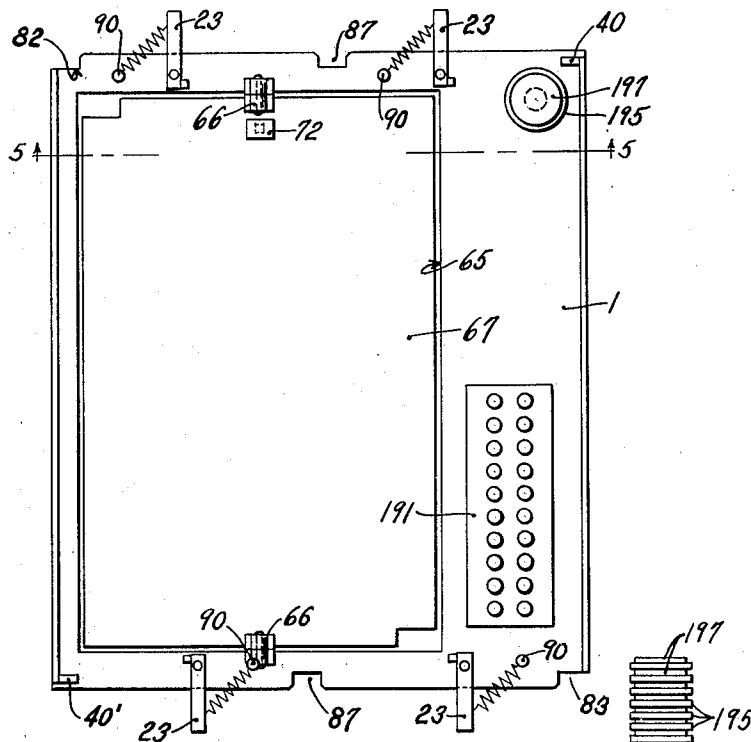


Fig. 5.

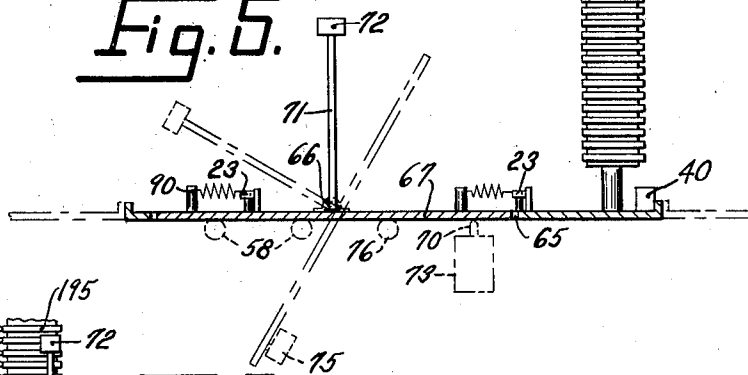
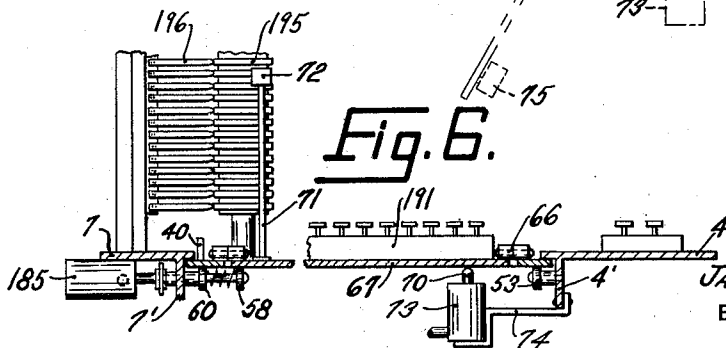


Fig. 6.



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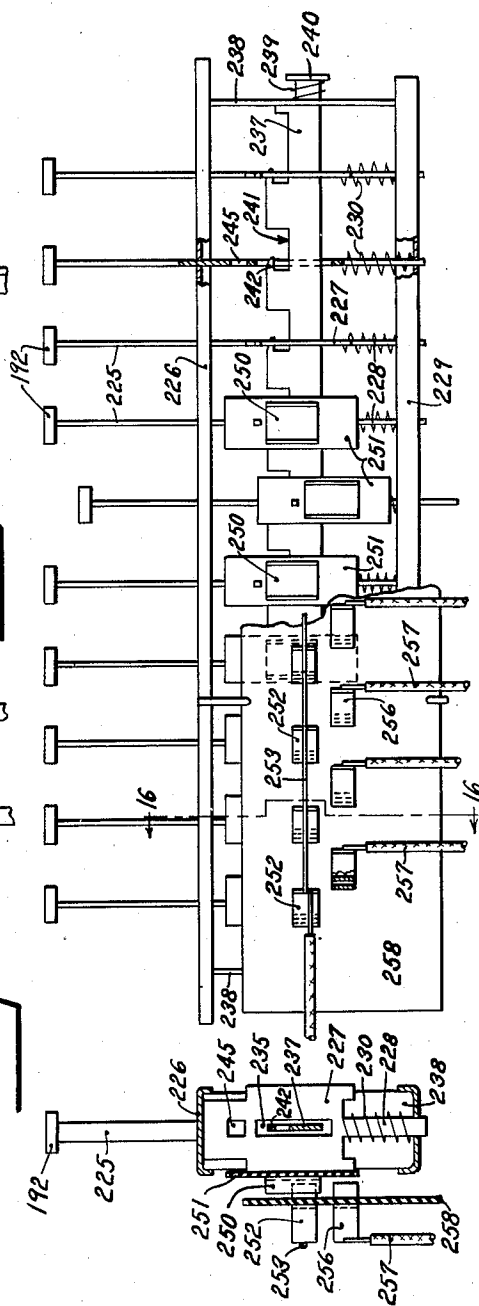
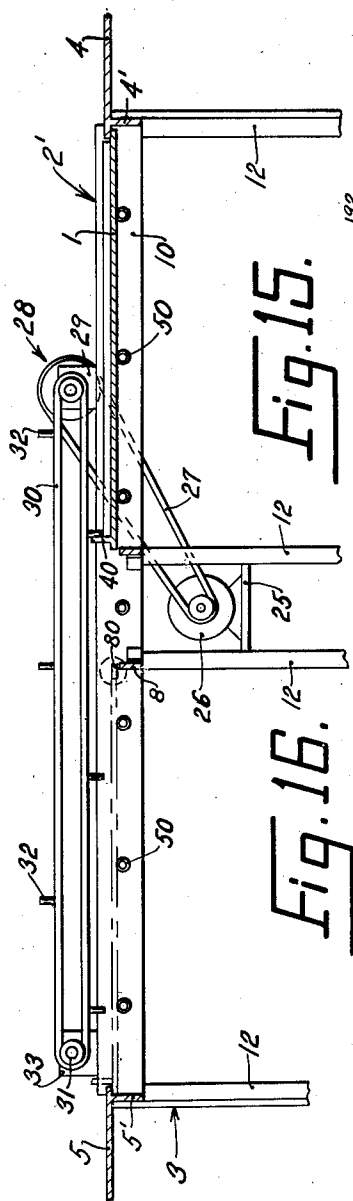
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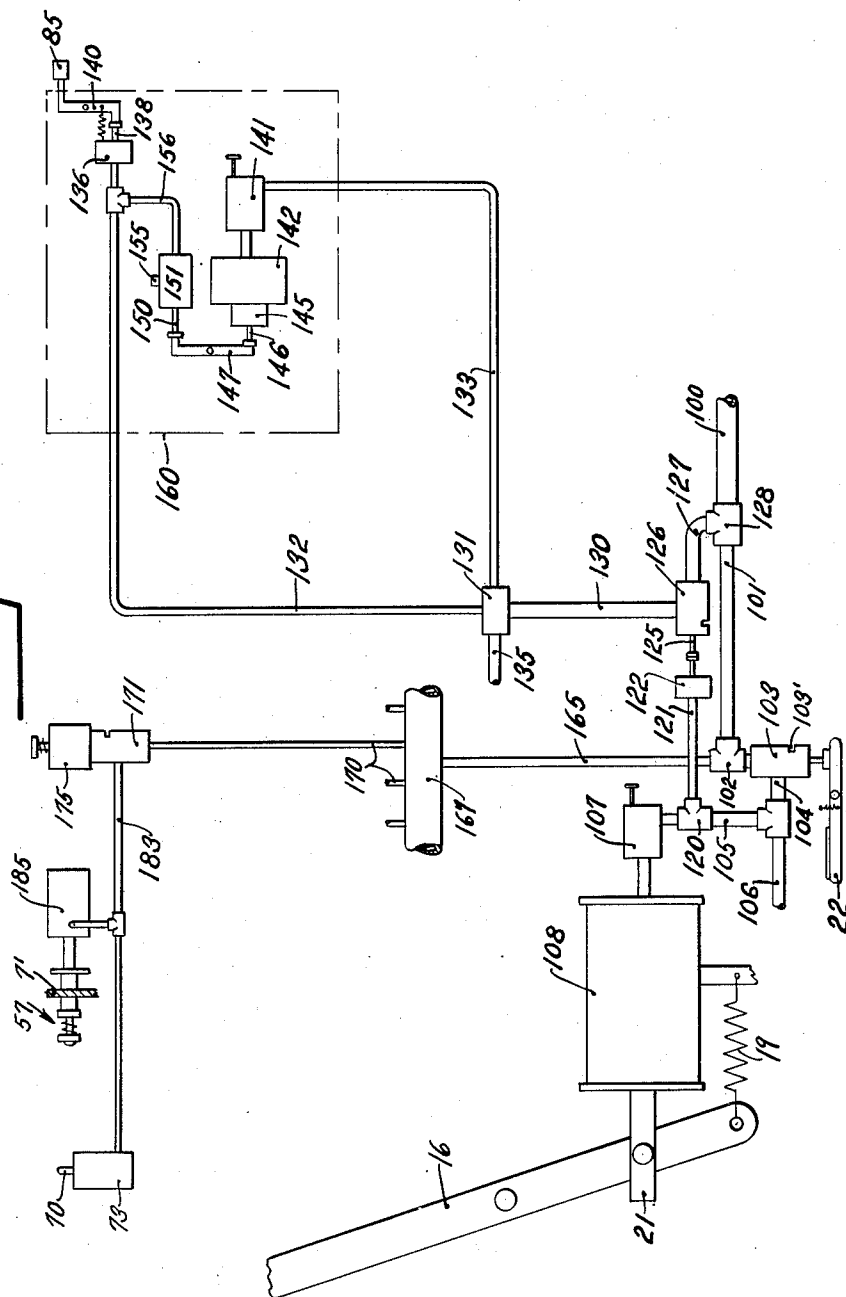
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Fig. 8.



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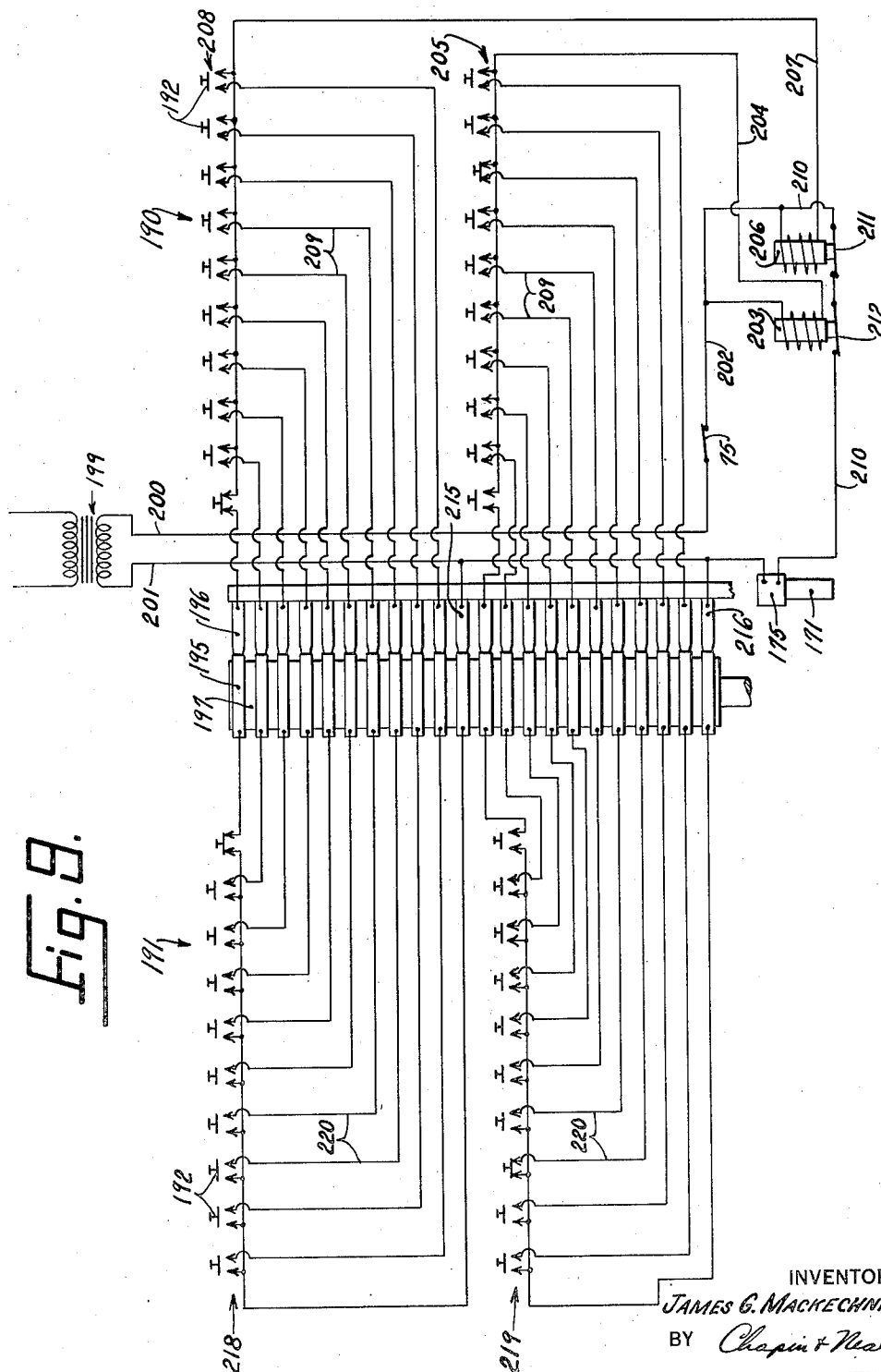
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Fig. 10.

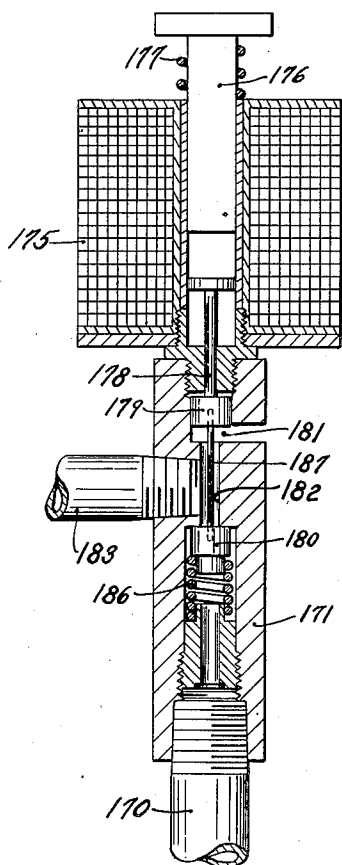


Fig. 11

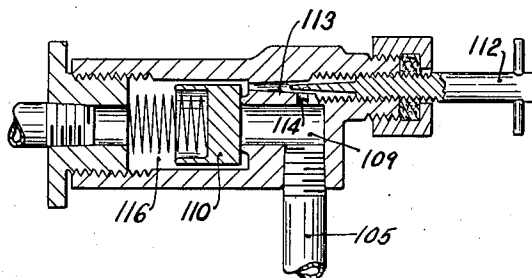


Fig. 12.

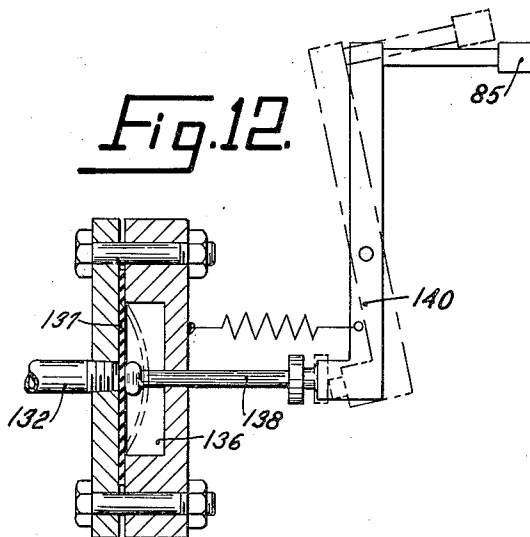


Fig. 13.

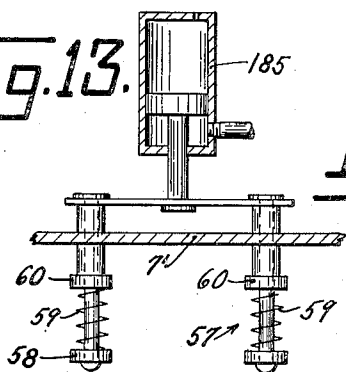
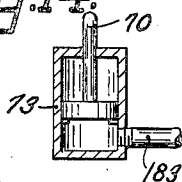


Fig. 14.



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UNITED STATES PATENT OFFICE

2,490,071

LAUNDRY SORTING APPARATUS

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Application June 28, 1947, Serial No. 757,768

12 Claims. (Cl. 214-11)

1

This invention relates to a selectively controlled sorting apparatus.

An object of the invention is to provide a machine which will be adapted to sort articles, as articles of clothing to be handled by a laundry for return to the proper owner.

A further object is to provide automatic means for conveying articles to preselected collecting bins where the various items of one owner are to be dumped.

Another object is to provide a machine operable by one or two persons who may deposit separate articles at a loading station or stations for distribution to a series of preselected dispensing stations.

Still another object is to provide automatic, electrically controlled, pneumatic means for the operation of dispensing an article from the carrying apparatus, the automatic controls being preset at the time an article is placed on the conveying mechanism.

These and other specific advantages will be appreciated by a consideration of the following detailed description of an embodiment of my invention in connection with the accompanying drawings in which:

Fig. 1 is a top plan view with some parts omitted to show the general layout of the machine;

Fig. 2 is a partial side view at one end of the machine with carrier means omitted for clarity, and taken on line 2-2 of Fig. 1 to show bin structure and carrier advancing mechanism;

Fig. 3 is a detailed top plan view of the end portion shown in Fig. 2 to show carrier supporting structure and other operative mechanism;

Fig. 4 is a detail plan view of a carrier;

Fig. 5 is a view on line 5-5 of Fig. 4;

Fig. 6 is a cross sectional view on line 6-6 of Fig. 3 to show a carrier support and dumping means;

Fig. 7 is a partial end view from the inside on line 7-7 of Fig. 1 to show means for transferring a carrier from the end of one longitudinal path to the beginning of the other;

Fig. 8 is a diagrammatic view of the pneumatic circuit provided for the carrier travel means and tray dumping means;

Fig. 9 is a wiring diagram showing the electric circuits for the presettable push button switch mechanisms;

Fig. 10 is a sectional view of a solenoid valve to provide a tray dumping operation;

Fig. 11 is a sectional view of a timer used in connection with the pneumatic circuit;

Fig. 12 is a sectional view of a diaphragm op-

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erated pneumatically and in connection with one of the tray positioning elements;

Fig. 13 is a sectional view of plunger mechanism for withdrawing rollers and controlled by the mechanism shown by Fig. 10;

Fig. 14 is a sectional view of a tray dumping means;

Fig. 15 is a side elevation of a push button mechanism with parts broken away; and

Fig. 16 is a section on line 16-16 of Fig. 15.

Conveyor travel

The sorting apparatus (Fig. 1) comprises a series of carriers 1 supported in successive order for longitudinal travel in opposite directions on two parallel adjacent conveyor paths. The starting locations for the two paths are indicated generally by numerals 2 and 3 respectively, and the end locations of these paths generally by 2' and 3'. As will be later described, the carriers are conveyed from their end locations crosswise of the machine to the starting locations of the adjacent conveyor path. Thus each carrier is conveyed in a complete circuit, having a rectangular counterclockwise travel, as shown.

The adjacent conveyor paths are defined by parallel side tables 4 and 5 and intermediate channel supports 6 and 7, the latter terminating adjacent the inner edge of each of the end and starting locations and being joined by end bars 8 and 9 to end supports 10 and 11 respectively. The bars 8 and 9 are set in a lower plane than supports 6 and 7 for crosswise transfer of carriers 1. Side tables 4 and 5, intermediate supports 8 and 9, and end supports 10 and 11 are mounted on legs as at 12 (Fig. 2). Immediately below the carriers are located, on horizontal supporting bars 13 fixed between legs 12, a series of clothes bins 14 into which the contents placed on the carriers 1 may be dumped, as will be later described. Short legs 15 may be provided for the support of the bins on bars 13, it being understood that the number of legs 12 and 15, bars 13, and other supporting structure will be governed by the size of the particular apparatus.

The parallel travel in opposite directions of carriers 1, as in Fig. 1 on each side of the machine, is accomplished by pneumatically operated means best shown by Fig. 2. The mechanism for a step by step advance of the carriers is the same for each side of the machine. Adjacent the starting location 2 (Fig. 2) is a pusher rod 16 pivoted on a supporting bar 13 as at 17 and projecting at its upper end through a slot 18 in table 4. The upper end of pusher 16 is nor-

mally held in rearward position (to the left as in Fig. 2) by a spring 19 fixed to the lower end of the pusher and to an adjacent leg 15. Between the spring attachment and pivot 17 a piston rod 20 is attached to pusher 16 to pivot the upper end of the pusher in a forward direction in its slot. The pivoted position is shown in dotted line. Piston 21 and rod 20 are pneumatically operated as will be described by depressing foot pedal 22.

A carrier is advanced one step by each pivoting operation of pusher 16. On the outer edge of a carrier are provided two spring held dogs 23 (Fig. 1) which are successively brought into contact with pusher 16. On each forward movement of the pusher, the adjacent dog 23 is pushed forward and with it the carrier. The pusher is then returned rearwardly by spring 19 past the next dog 23 upon release of the foot pedal causing the piston rod to be retracted.

It will be noted that as each carrier is pushed directly by pusher 16 the carriers in front of that carrier are also moved forwardly. A carrier at the end of the line is thus moved into an end location 2' or 3'. As the carriers reach the end locations the starting locations 2 and 3 are vacated and ready to receive carriers from the end zones of the adjacent conveyor path.

The mechanism for transferring carriers crosswise, shown in top plan by Fig. 1 and on enlarged scale in side elevation by Fig. 7, comprises a motor driven endless belt arrangement. On a bracket support 25, fixed as between legs 12 (which are preferably in the form of angle irons), is mounted a motor 26 driving by belt 27 the pulley drive indicated by 28. The latter is mounted on a bracket 29 to end support 10. The carrier transfer belt 30 connects pulley drive 28 and a pulley 31 mounted on a bracket 33 also fixed on support 10 adjacent its opposite end, in Fig. 7, the side table 5. Belt 30 is provided with spaced projecting pins 32.

As shown in the detail view of Fig. 4 and in Fig. 7 the leading inside corner of carrier 1 is provided with a projection 40 which will lie in the path of the pins 32 on belt 30 when the carrier is moved completely into end zone 2' or 3'. Motor 26 is adapted for the continuous driving of belt 30. As will be seen in Fig. 7, a pin 32 will thus contact projection 40 and move the carrier crosswise into the starting location of the adjacent conveyor path. Fig. 7 shows the cross over operation for the right hand end (as in Fig. 1) of the machine. For the similar handling of the cross over at the other end of the machine a projection 40' (Fig. 4) at the opposite corner of the carrier is provided.

Carrier supporting and tray dumping means

Supporting means for conveyance of the carriers 1 in the circuit of travel comprises sets of rollers best illustrated by Fig. 3. At the starting location (as at 2) are oppositely placed rollers 50, one set fixed to the end support 11, its complementary set to a strap 52 joining the end of intermediate support 7 and side table 4. These rollers are provided for support of a carrier 1 during its crosswise travel from the end location of the adjacent conveyor path.

In its starting position and moving therefrom for longitudinal travel the carrier is supported by rollers 53 attached to a depending vertical flanged portion 4' of side table 4, and oppositely located double rollers 55 fixed to the facing side of end bar 9.

As the carrier is moved forwardly between side table 4 and its complementary intermediate channel support 7 it is supported by the rollers 53 on flange portion 4' and on the opposite side along channel support 7 by double rollers 57 in line with rollers 55. Rollers 57 are fixed to a depending vertical flanged portion 7' of support 7.

Rollers 57, as constructed, permit retraction of their outer roller members 58 against springs 59, mounted on the shanks between inner members 60 and members 58. The means for accomplishing retraction will be later described, the purpose for doing so will now be explained.

It will be noted in Fig. 3 that each carrier 1 is provided with a rectangular opening 65 in which an article tray 67 is pivotally hinged at opposite sides as at 66. Tray 67 is adapted for pivotal turning above any one of the bins 14 so as to dump an article carried on the tray by force of gravity into a preselected bin.

Tray 67 as shown by Fig. 5 is adapted for tilting to slide an article off the tray. The tilting is accomplished by means of a pneumatically operated plunger 70 sliding in cylinder 73 on bracket 74 fixed to flange 4' (Figs. 3 and 5). The plunger 70 contacts the underside of the forward edge of a tray, overbalancing the same. At the same time the outer roller members 58 are retracted thereby permitting the lowering of the rearward edge of the tray, the tray pivoting at 66. Plunger 70 merely commences the overbalancing of the tray. An upstanding post 71 having a weighted top 72 causes the further pivoting of the tray to the dotted line position of Fig. 5. Here the depending edge portion of the tray contacts an electrical circuit breaker switch 75 which permits the outer members 58 of the retracting rollers to be spring pressed to normal position. This operation will be later described.

In Fig. 3 it will be noted that a fixed double roller 76 is provided in the flanged portion 4' of side table 4. When the tray 67 is in position for pivoting, roller 76 is under the forward half of the tray. When the carrier is advanced in the step by step travel roller 76 is adapted to contact the depending rear portion of the tilted tray. Contact of roller 76 will cause the tray to be turned back into horizontal position to lie in the plane of its carrier.

Positioning elements are also provided at various locations on the machine in the path of carrier travel. These elements are adapted to maintain correct alignment and the relative position of the carriers during the step by step conveyance.

One such element is a spring pressed cam 80 (Fig. 3) attached to end support 11 for guiding the outer edge of a carrier 1 as it enters starting location 2 during transverse travel from end location 3'. The beveled end 81 causes depression of cam 80 and exerts pressure on the carrier edge until it is positioned in starting location 2. Beveled end 81 then slides into a notch 82 cut in the rear corner of the carrier. This prevents any backward motion or sliding when the operator of the machine places an article on the carrier. A corresponding notch 83 is cut in the diagonally opposite corner of the carrier for the same purpose when the latter is at the other end of the machine and entering starting location 3.

Notches 82 and 83 serve a further purpose in connection with stop checks 85 (Fig. 1) which are located adjacent the outside edges of the carrier path immediately before end locations 2' and 3'. Checks 85 are operated pneumatically in timed relation as will be described, and project

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into notches 82 or 83 or into intermediate notches 87 cut centrally on opposite sides of the carrier. Since each step in the travel of the carriers moves each carrier one half the distance of its width, checks 85 are alternately inserted in notches 82 or 83 and 87. The dislocation by forward movement of any carriers in the parallel lines is thus prevented.

The carriers are further provided with pins 90 adjacent each side thereof. Pins 90 (which also serve as anchor means for the attachment of the spring members on dogs 23) project above the surface of a carrier and cooperate with spring pressed stop cams 92 to insure against chance dislocation by rearward movement. Cams 92 hold the rearmost carrier (Fig. 1) against back sliding as it is moved from starting location 2 or 3. The cams are provided with beveled edges to permit the free passage of the pins forwardly as the carriers are advanced by pusher 16.

Pneumatic mechanism

How the pneumatic means of the machine is adapted for imparting travel to the carriers by pusher 16; for dumping the tray contents into a bin by tilting through plunger 70; and for operating the stop check 85 all in timed relation is shown by the diagram of Fig. 8.

Compressed air is supplied from a suitable source through a pipe 100. Through connector pipe 101 and T connection 102 air under pressure enters valve 103 whenever foot pedal 22 is depressed. Outlet 104 leads to piston cylinder inlet conduits 105 and 106. Conduit 106 supplies a complementary pusher mechanism on the diagonally opposite side of the apparatus. At the end of inlet 106 is mechanism identical to that to be now described.

Air through inlet 105 is supplied to timing mechanism 107 and thence to cylinder 108 in which is located piston 21 (Fig. 2) for operation of pusher 16.

Said timing mechanism 107 is shown by Fig. 11. From inlet 105 air enters chamber 109 where pressure is allowed to build up to unseat spring pressed member 110. The rate at which pressure may be increased against member 110 is predetermined by the adjustment of threaded stem 112 extending into a bleed hole passage 113 in communication with chamber 109 through a port 114. The outlet of passage 113 bypasses the member 110 into outlet chamber 116 of the timer. It will be obvious that adjustment of the timer stem 112 regulates the delayed action of air pressure building up in piston chamber 108 (Fig. 2) sufficiently to move pusher 16 against the spring 19. Pusher 16 is returned by spring 19 when air from chamber 108 is exhausted through a port 103' of valve 103. Exhaust port 103' is opened on removal of pressure from spring held foot pedal 22.

The delayed operation of piston rod 20 permits retraction of stop check 85 from the path of the carriers 1, that is, its withdrawal from a notch 82 or 87 before the advancement of the carriers by the pusher.

It will be noted that inlet pipe 105 is joined by a T connection 120 and pipe 121 to a chamber 122 having a flexible diaphragm therein movable under pressure of air to extend a release pin 125 of valve 126. Valve 126 is located in a branch 127 leading from a T connection 128 of the supply pipe 100. Air pressure is released through valve 126 when pin 125 is actuated. Pressure then is established in conduit 130 leading to a connector 131, which distributes air pressure through pipes

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132 and 133 to the pneumatic mechanism for operating the stop check 85. A conduit 135 leads from the connector 131 to similar pneumatic mechanism for the complementary stop check 85.

Pipe 132 leads to a diaphragm chamber 136 similar to chamber 122 and acting to extend pin 138. Extension of pin 138 pivots a spring held lever 140 which swings check 85 out of a notch 82, 83 or 87. This permits the movement forward of the carriers by pusher 16 and is the reason for having the timed delay for operation of said pusher. Since it is desirable to have the check 85 retracted until such time as the notch 82 or 87 has passed by the check position and yet to have said check be released against the side of the carrier for stopping the carriers at the next station, a timing release mechanism is provided. The means for releasing said check 85 is pneumatically operated through mechanism connected to pipe 133. Pipe 133 leads to a timing mechanism 141 similar to timer 107 before described in connection with the piston chamber inlet 108 and shown in Fig. 11. To insure enough time for building up the requisite amount of pressure in piston chamber 108 to move the carriers, further delay in releasing check 85 is provided at the outlet of timer 141 by an enlarged chamber 142. Accordingly, when check 85 can be released pressure in chamber 142 has increased to the point at which it actuates a diaphragm in chamber 145 thereby through pin 146 pivoting a lever 147 to depress a valve release pin 150 of valve 151. Air is released to the atmosphere through an outlet 155 of valve 151. It is the release of air supplied by inlet pipe 132, an inlet 156 of valve 151 being joined by a T connection to said pipe 132.

The stop check operating mechanism as just described is contained in a casing indicated by numeral 160 and is shown in association with check 85 in position on the machine as in Fig. 1.

Fig. 12 shows the structure of the diaphragm chamber 136 which is similar to the other diaphragm chambers mentioned. The air enters an inlet as 132, moving a flexible diaphragm as 137, to actuate the pin 138.

Means for dumping the tray contents into a bin 14 is pneumatically operated by the system shown connected by pipe 165 which leads off the connector pipe 101 and through T connection 102. Pipe 165 affords passage of air under pressure to a distributor pipe 167 from which a series of branch pipes 170 are tapped, one for each tray dumping station. In each case pipe 170 leads to a solenoid operated valve 171 which is shown in detail by Fig. 10. It will be noted that all branch pipes 170 are continually supplied with air pressure. On energizing solenoid 175, as will be later described, the plunger 176 is actuated against spring 177 to depress an actuating stem 178 for an exhaust valve 179 and an inlet valve 180. The latter are connected by a link 187, said exhaust valve 179 closing off an exhaust port 181, and the inlet valve opening an inlet port 182 leading to an outlet 183. Outlet 183 immediately discharges air into piston chamber 184 operating the retractable double rollers 57. Air also enters a piston chamber 73 operating the plunger 70 to tilt a carrier tray 67 as previously described. These devices are shown in Figs. 13 and 14.

Air from the two chambers 185 and 73 is exhausted by deenergizing the solenoid which permits the seating of inlet valve 180 by a valve spring 186 and the unseating of exhaust valve 179 to release pressure through exhaust port 181. The solenoid is deenergized by interruption of the

electric circuit when the lower edge of the tray contacts circuit breaker 75 as previously mentioned.

Presetable electric controls

An electric circuit controlling means governing solenoids 175 and thus the operating means at each bin to dump an article from the tray at said bins is shown by the wiring diagram of Fig. 9. One circuit controlling means is made up by partial circuits associated with each bin and corresponding partial circuits associated with each carrier. Each of the partial circuits includes a presetable push button switch closing mechanism, one for each carrier and one for each bin.

The push button switch closing mechanisms for the bins are indicated in Fig. 1 by the numeral 190. They are mounted in rows of boxes along side tables 4 and 5. Corresponding push button mechanisms for the carriers 1 are indicated on carriers 1 by numeral 191. Each push button box 190 for the bins has twenty push buttons 192 (Fig. 3) and each box 191 for the carrier has twenty push buttons 193 (Fig. 4). Thus the apparatus is adapted for handling articles for 100 bins. The number of switches of course can be increased or decreased to accommodate the number of sorting bins desired in any particular apparatus.

Both push button box mechanisms are presetable. Each bin box mechanism is set prior to operation of the apparatus to correspond to the number assigned as a laundry mark, for example, to a particular customer. When loading the carriers in a starting location for the automatic sorting of articles, each individual carrier box mechanism is set to correspond with the mark on the clothing and the mark previously assigned to a particular bin for collecting that customer's articles. Partially completed electric circuits are thus established to be energized by the closing of the circuits when the carrier arrives at the preselected bin.

Switch means operable to close an electric circuit for dumping articles from the carrier tray at preselected bins comprise positioned distributor contacts 195, mounted on the edges of carriers 1, and stationary finger contacts 196, mounted on channel support 7 and on side table 5 (see Fig. 1). The joining of these contacts will be established as step by step travel is imparted to the carriers. Each of the distributor contacts are separated by insulation as at 197, each of the fingers as by insulation at 198 (Fig. 9).

As shown by Fig. 9, power is supplied to each switch box by a suitable source through a transformer 199. A line 200 connects with the partial circuits for each bin. A line 201 is adapted to complete a circuit when the corresponding partial circuit of the carrier mechanism is connected therewith.

Line 200 connects with said push button switches 192 through a breaker switch 75, a wire 202, a solenoid 203, and connecting line 204 to one terminal of the push button switches in a row designated as 205. Row 205 represents the unit values in the system. Line 200 is similarly connected through breaker switch 75, wire 202, a solenoid 206, and a connecting line 207 to one terminal of the push button switches in a row designated as 208. Row 208 represents the decimal values in the system. The other switch terminals in each case are connected by lines 209 to the series of finger contacts 196.

A continuation of wire 202 for each partial bin circuit is provided by a connector wire 210 having two switches 211 and 212 operated by the solenoids 206 and 203 respectively. Wire 210 through the switches is connected to a terminal of solenoid 175 which operates pneumatic valve 171 to dump the tray contents. The other terminal of solenoid 175 is connected to line 201, completing the presetable circuits for each bin.

Line 201 is adapted for connection with a carrier circuit through line contacts 215 and 216 which are in turn connected to terminals of the carrier push button switches. Contact 215 connects one terminal of the switches, as row 218 representing the decimal values. Contact 216 connects one terminal of the switches, as row 219 representing the unit values. The other terminals of said switches in each case are connected by lines 220 to distributor contacts 195.

In operation the bin push buttons are depressed for a particular number between 00 and 99. As the carrier tray is loaded with an article bearing the particular number, the carrier buttons are depressed with the corresponding number. Switches 211 and 212 are open and remain so until solenoids 206 and 203 are energized. This occurs when the partial circuit, set up in the bin switch box mechanism is completed through the distributors and finger contacts by a circuit corresponding to it in the carrier switch box.

Referring to the position shown by Fig. 9, both circuits are set for number 29. It will be seen that the connection of corresponding partial circuits is here established by contacts 195 and 196. Solenoids 203 and 206 are energized thus closing switches 212 and 211. Solenoid 175 is thus energized and, as has been noted, will operate the tray dumping means.

As previously described, the tilting of carrier tray 67 contacts breaker switch 75. This will then deenergize solenoids 203 and 206 opening switches 211 and 212 to leave the mechanism ready for a succeeding appropriate completion of a circuit by the carrier distributor contacts 195.

Push button mechanism

Push button switch mechanism for the presetable partial circuits is shown in the detail views of Figs. 15 and 16. A push button 192 is mounted on a stem 225 slidable in box cover 226. Stem 225 is provided with a flat plate 227 having a depending extension 228 which is slidable in bottom frame plate 229. On extension 228 is mounted a spring 230 normally urging the plate 227 upwardly to raised position.

Centrally of the plates 227 are provided aligned rectangular openings 235 (Fig. 16). Passing through each opening 235 is a longitudinal cam plate 237 mounted on end supports as at 238. Cam 237 lies midway between bottom frame plate 229 and cover 226 and is spring pressed to the right, as shown by Fig. 15, by a spring 239 on a stud extension between a collar 240 and support 238.

Adjacent each stem plate 227 on cam 237 are provided generally rectangular recessed portions 241 having cam hooks 242 lying in the downward paths of the plates. A hook 242 is adapted to move cam 237 against spring 239 when the push button is depressed. Immediately above an opening 235 in plate 227 and spaced therefrom is a catch opening 245 (Fig. 16) to receive the hook 242 of the cam. A stem 225 is thus held in depressed position whenever the cam is spring pressed to the right as in Fig. 15.

It will be understood from the above that when one of the buttons of the row shown in Fig. 15 is depressed, it will remain so until such time as another button is depressed in a similar manner. By depressing a second button the plate 227 pushes cam 237 to the left releasing the hook 242 associated with a previously depressed button from its catch 245 so as to permit spring 228 to raise that button to normal position. Return of cam 237 to the right is permitted by the hook 242 projecting into the catch 245 of the second stem plate, whereby the second button is held in depressed condition until similarly released.

The switch connection associated with each button comprises a U-shaped switch 250 attached to an insulating piece 251 fixed on the edge of stem plate 227. As shown by Fig. 16 an arm of the switch 250 is in contact with a terminal 252 and thus connected with a terminal wire 253. It will be seen that depression of the push button of Fig. 16 will cause the switch 250 to connect terminal 252 with a second terminal 256 by sliding the switch downwardly. Terminal 256 is connected in the circuit by a terminal wire 257. Said terminals and terminal wires are mounted as shown on an insulating plate 258 supported in the box.

It will be noted in Fig. 1 that the distributor contacts 195 in the lower path of travel are mounted on the forward part of the carrier and on the upper or return path of travel in a rearward position with respect to said carrier travel. Because of the change in relative positioning it will be seen that the finger contacts 196 are mounted so that the carrier will be entirely clear of the starting locations 2 and 3 before any contact with the distributor contacts 195 is had. In order to clear said locations each carrier will be advanced two steps prior to establishing said contact. Thereafter contact will be established at every step until a carrier enters the end locations 2' and 3'.

Operation

In the operation of the sorting apparatus an attendant may have in one large batch a collection of laundered items to be sorted among as many as one hundred customers. Each article has been marked with a number identifying the owner. Accordingly, the push button mechanism for each bin is operated to give it an identifying number corresponding to the laundry mark on the items of laundry to go into that bin. No circuits are completed by this operation. Partial circuits only are set up for the finger contacts 196 to be ready for the closing of a circuit.

The machine then is started in operation, the attendant depressing the foot pedal to advance the carriers step by step in successive order. As each carrier enters the starting location, the attendant picks up an item of laundry, notes the mark thereon, and punches the carrier push button mechanism to correspond with the number on the item. This operation sets up a partial circuit in the carrier switch box mechanism for the distributor contacts to be ready for the closing of a circuit.

When the carriers are advanced in step by step travel each one will eventually reach the bin which has been "preset" to correspond with the laundry mark on the item carried thereby, and with the setting of the push button mechanism on the carrier bearing the item. The contact of the positioned switch means represented by the finger contacts and distributor contacts will close the electrical circuit, energize the solenoid to tilt

the tray, thus dumping the contents thereof into the appropriate collecting bin. No tray will operate to dump its contents until it reaches the bin with the preselected number to correspond with the number of the laundry mark.

This operation will continue until the entire collection of laundered items is properly sorted. Each bin will have all the items of the laundry mark corresponding to that particular bin.

Having disclosed my invention, I claim:

1. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a partial circuit including a presettable push button closing switch associated with each bin, and a corresponding partial circuit including a corresponding presettable push button closing switch associated with each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding partial circuits of said bin and said carrier into a complete circuit, the completion of said circuit serving to operate the aforesaid dumping means at said bin conditional upon the closing of both said presettable push button switches.

2. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit.

3. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to con-

nect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit, each separate group of push button switches having means for rendering an individual push button switch thereof selectively and exclusively operable to closing position.

4. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a partial circuit including a presettable push button closing switch associated with each bin, and a corresponding partial circuit including a corresponding presettable push button closing switch associated with each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding partial circuits of said bin and said carrier into a complete circuit, the completion of said circuit serving to operate the aforesaid dumping means at said bin conditional upon the closing of both said presettable push button switches.

5. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit.

6. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, and means for imparting said travel to said carriers, each carrier having a tray operable for dumping its contents into a bin, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push but-

ton switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit, each separate group of push button switches having means for rendering an individual push button switch thereof selectively and exclusively operable to closing position.

7. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for successively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a bin, and a foot treadle operated valve for controlling said pneumatically operated means, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a partial circuit including a presettable push button closing switch associated with each bin, and a corresponding partial circuit including a corresponding presettable push button closing switch associated with each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding partial circuits of said bin and said carrier into a complete circuit, the completion of said circuit serving to operate the aforesaid dumping means at said bin conditional upon the closing of both said presettable push button switches.

8. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for successively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a bin, and a foot treadle operated valve for controlling said pneumatically operated means, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit.

9. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for suc-

cessively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a bin, and a foot treadle operated valve for controlling said pneumatically operated means, and electric circuit controlled operating means at each bin for dumping a selected carrier tray at said bin, said electric circuit means comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit, each separate group of push button switches having means for rendering an individual push button switch thereof selectively and exclusively operable to closing position.

10. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for successively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a bin, and a foot treadle operated valve for controlling said pneumatically operated means, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a partial circuit including a presettable push button closing switch associated with each bin, and a corresponding partial circuit including a corresponding presettable push button closing switch associated with each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding partial circuits of said bin and said carrier into a complete circuit, the completion of said circuit serving to operate the aforesaid dumping means at said bin conditional upon the closing of both said presettable push button switches.

11. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for successively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a

bin, and a foot treadle operated valve for controlling said pneumatically operated means, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit.

12. In a selectively controlled sorting apparatus in combination, a row of bins, a series of carriers adapted to travel over said bins in successive order, pneumatically operated means for imparting a step by step travel to said carriers for successively bringing each carrier into registration with one bin after the other, each carrier having a tray operable for dumping its contents into a bin, and a foot treadle operated valve for controlling said pneumatically operated means, means at each bin for dumping a selected carrier tray comprising pneumatically operated plunger means and a solenoid operated air valve, and electric circuit controlled means for said solenoid comprising a group of partial circuits associated with each bin, each of said bin circuits including a separate and presettable push button closing switch, a group of partial circuits associated with each carrier, each of said carrier circuits including a separate and presettable push button closing switch, each circuit and its push button switch of each bin corresponding to one of the circuits and its push button switch of each carrier, and positional switch means operated by the arrival of a carrier at a bin to connect the corresponding circuits of said carrier and bin into completed circuits, and one of said completed circuits serving to operate the aforesaid tray dumping means at said bin conditional upon the closing of the corresponding push button switches in each part of said completed circuit, each separate group of push button switches having means for rendering an individual push button switch thereof selectively and exclusively operable to closing position.

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No references cited.