June 2, 1931. E. L. HURD 1,808,405

LAUNDRY CHECKING AND ASSEMBLING APPARATUS

Filed Sept. 1, 1927 5 Sheets-Sheet 1

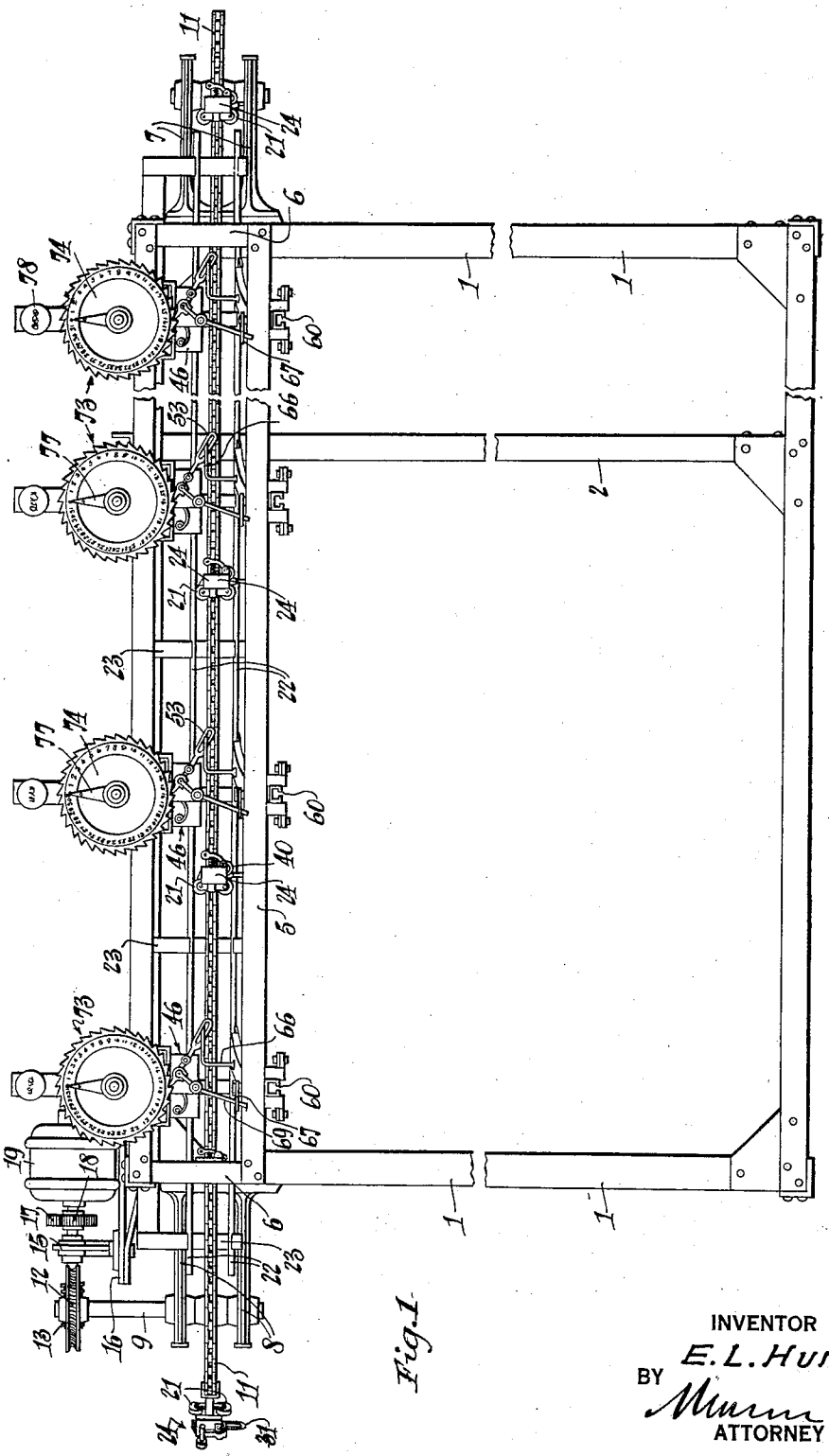


Fig. 1

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LAUNDRY CHECKING AND ASSEMBLING APPARATUS

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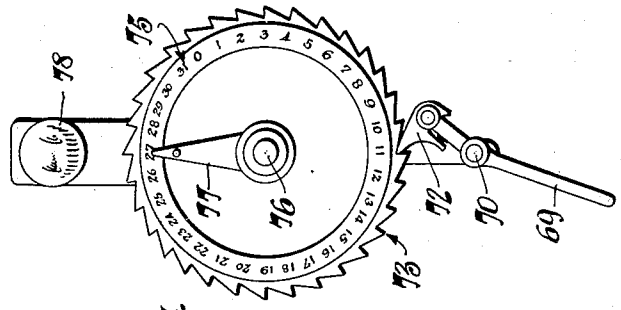


Fig. 14.

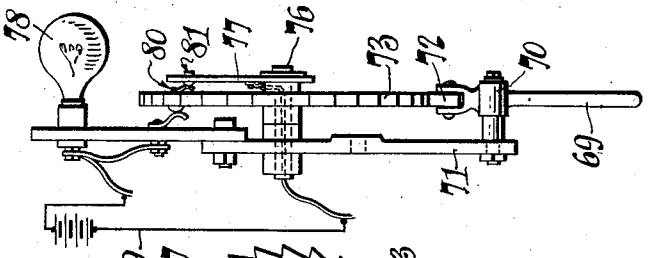


Fig. 12.

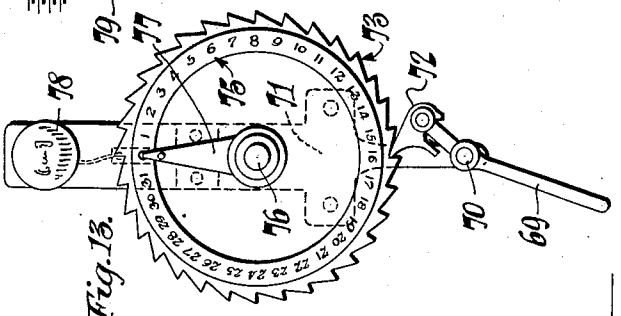


Fig. 13.



Fig. 2.

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LAUNDRY CHECKING AND ASSEMBLING APPARATUS

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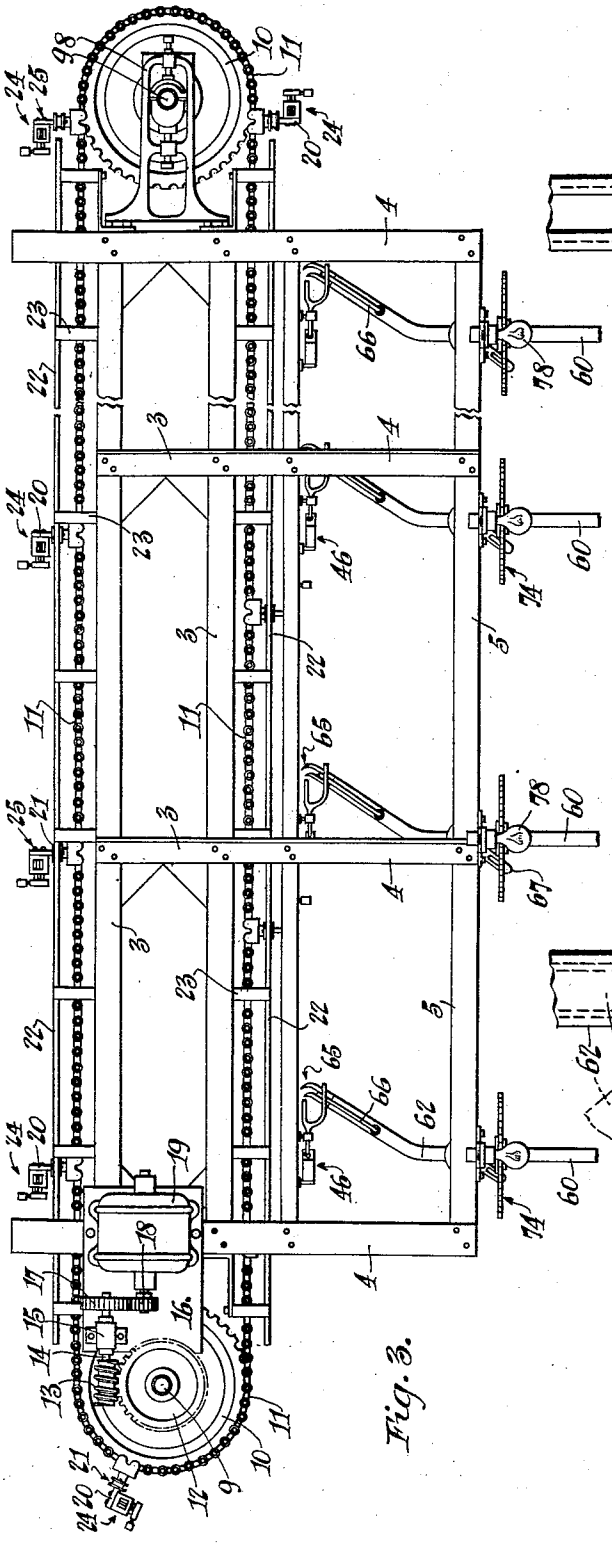


Fig. 3.

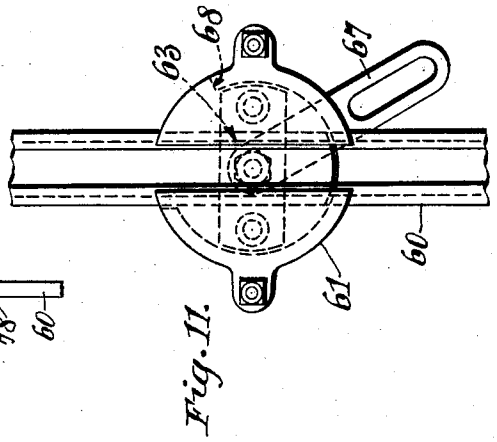


Fig. 11.

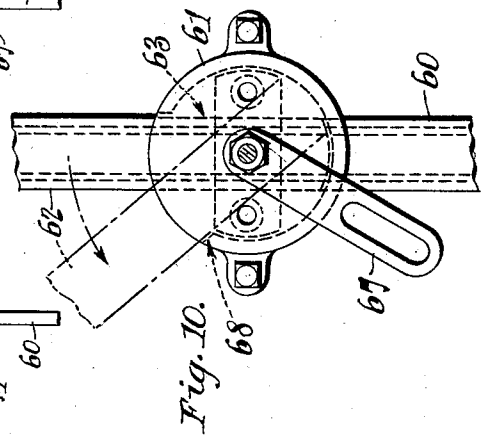


Fig. 10.

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LAUNDRY CHECKING AND ASSEMBLING APPARATUS

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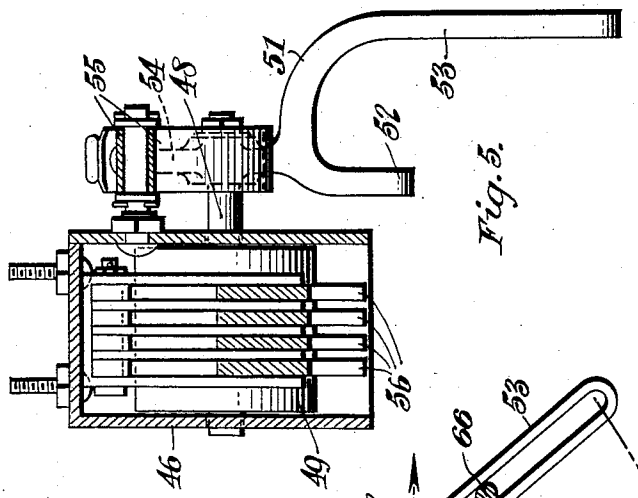


Fig. 5.

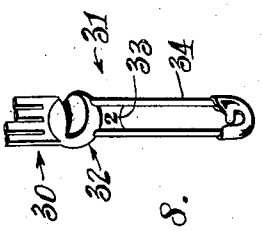


Fig. 8.

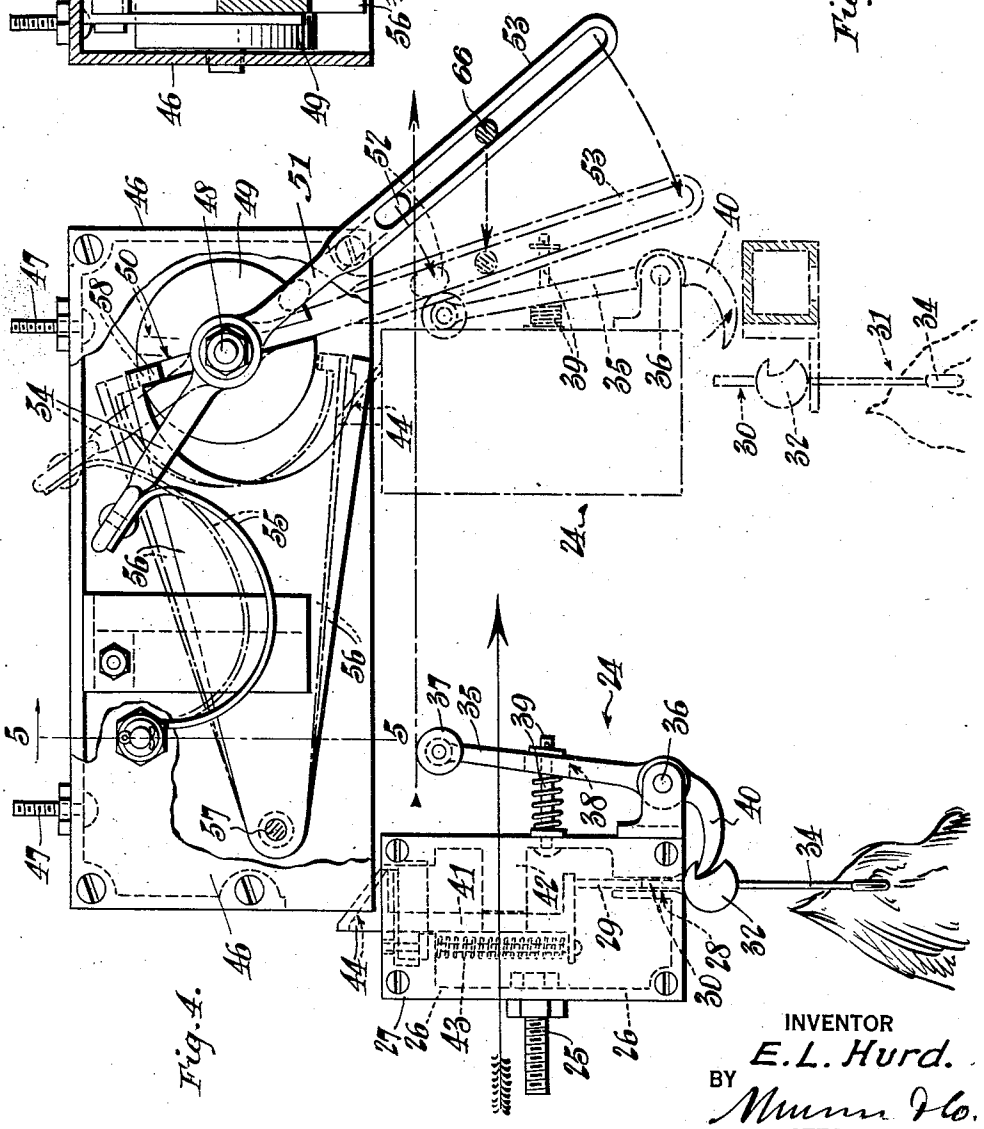


Fig. 4.

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LAUNDRY CHECKING AND ASSEMBLING APPARATUS

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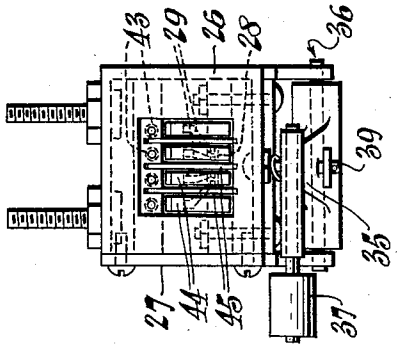



Fig. 6.

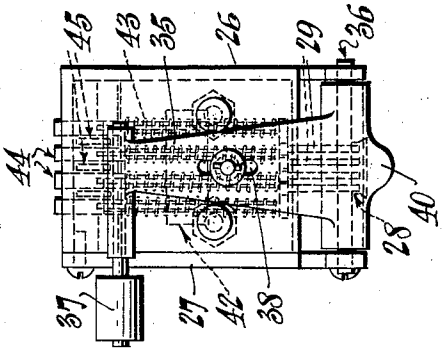



Fig. 7.

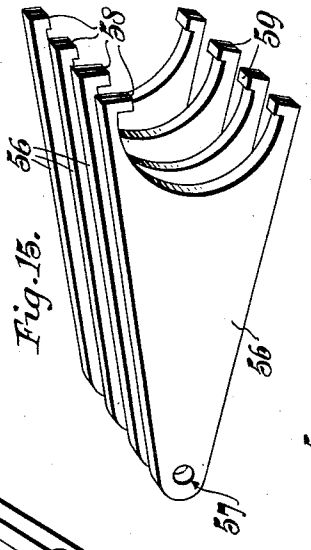



Fig. 15.

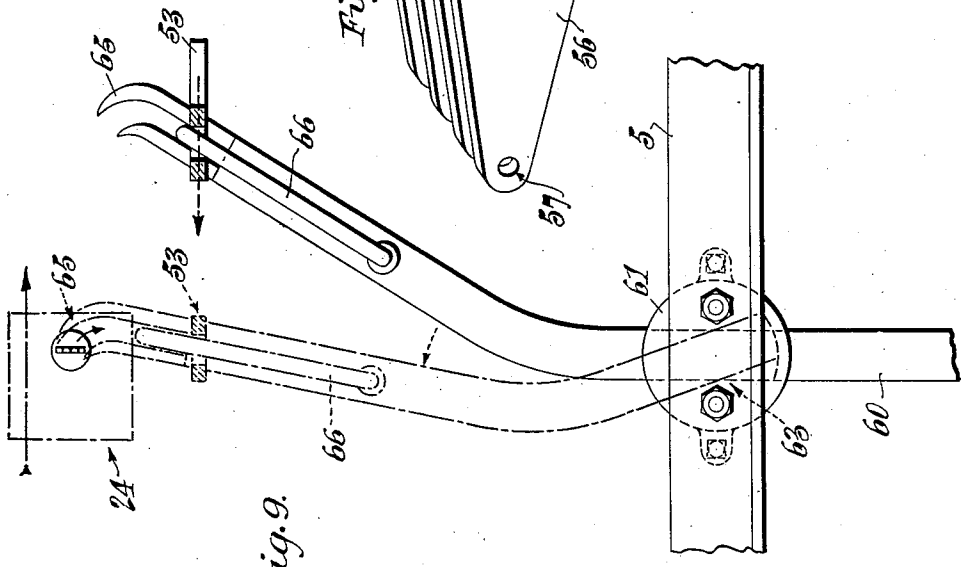



Fig. 9.

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# UNITED STATES PATENT OFFICE

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## LAUNDRY CHECKING AND ASSEMBLING APPARATUS

Application filed September 1, 1927. Serial No. 216,914.

The invention primarily has for its object to provide a new and improved mechanical means to check and assemble articles or bundles of laundry to assure proper accounting for work done and return of all articles or bundles to their rightful owners.

It is the present common practice in the laundry business to imprint upon each article of laundry received from a customer an identifying mark, which mark is also entered upon that customer's bill slip together with the number of pieces received and their nature so that the identity of the laundry may be determined and the cost for service determined.

Special checkers have to be employed to carefully inspect the completed laundry and assort and assemble it into piles according to the identifying markings on the pieces or bundles. These checkers, because of the exacting nature of their work, are among the highest paid of laundry employees and, despite their great care and skill, the laundries have to spend great sums each year in replacement of "misassembled" laundry.

Therefore, in its more detailed nature, the invention seeks to provide mechanical means to check or mark the laundry and a machine with which the checking means are mechanically associated and which receives the laundry piece by piece and mechanically assembles the same into piles or racks according to the identifying checks or markers carried thereby.

More specifically the invention resides in the provision of checks or markers to be attached one of a like set to each piece of a bundle of laundry and being in the nature of trip actuation controlling keys, and a machine comprising assembly racks, counting or checking devices associated with each rack to count or check the articles as they are assembled on the racks, a conveyor chain, carrier heads on the chain and upon which the checks or markers are attachable to carry the article secured thereto, trip devices to release the articles and deposit them onto the racks, and release devices to actuate the trip devices associated with that rack only with which the check or marker carried by a certain head is identified.

With the above and other objects in view that will hereinafter appear, the invention still further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation of the machine, parts being broken away.

Figure 2 is an end view of the machine looking toward the motor equipped end.

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

Figure 4 is a side elevation of a trip mechanism and an approaching carrier head, the engaged or actuated position of the parts being shown in dot and dash lines.

Figure 5 is a vertical cross section taken on the line 5—5 on Figure 4.

Figure 6 is a plan view of one of the carrier heads.

Figure 7 is an end elevation of one of the carrier heads.

Figure 8 is a perspective view illustrating one of the checks or markers.

Figure 9 is a somewhat diagrammatic horizontal section illustrating the action of depositing a check or marker and the laundry piece carried thereon upon a rack, the normal position of the parts being shown in full lines and the depositing action being shown in dot and dash lines.

Figure 10 is a plan view of one of the rack bearing heads.

Figure 11 is an inverted plan view of the rack bearing head.

Figure 12 is an enlarged edge view of one

of the piece counting and signalling mechanisms.

Figure 13 is an enlarged face view of the parts shown in Figure 12, a signalling position being shown.

Figure 14 is a view similar to Figure 13, an original set position being shown.

Figure 15 is a detail perspective view illustrating a cooperative set of lock bars disassembled.

In the practical development of the invention I provide end standards 1 and intermediate standards 2 which serve as supports for the horizontals 3 some of which are extended at one side as at 4 to mount the longitudinal frame bars 5 and verticals 6.

Bearings are secured in pairs 7—7 and 8—8 on each pair of end standards and serve to rotatably mount the stub shafts 9 having the sprockets 10 keyed thereupon to rotate in a horizontal plane. An endless conveyor chain 11 takes over the sprockets and one shaft 9 is vertically extended and carries a worm wheel 12 to which rotation is imparted by the worm 13 mounted on the shaft 14 having bearing at 15 upon the support plate 16 mounted on the framing. A gear 17 is secured upon the shaft 14 and meshes with the driver gear 18 on the shaft of the driving motor 19. Through these connections the endless chain is caused to travel in a horizontal path.

Upon selected links of the chain, at regular intervals, are mounted carrier head brackets 20 each having a pair of upper and lower rollers 21 adapted to ride on and be guided by the track rails 22 to prevent drooping of the side courses of the chain and cause the brackets to follow a true course. The guide rails are supported as at 23 upon the framing.

Each bracket 20 carries an article or piece carrier head 24 the latter being secured thereto as at 25.

The carrier heads each comprise a hollow casing 26 closed by a cover plate 27 through which access may be had to the interior of the same. A key receiving slot 28 is formed in the bottom of the casing into which the key fingers 29 project from within the casing, and the said slot is adapted to receive the key end 30 of a check or marker 31 having a notched keeper head 32, an identifying number 33 and a safety-pin-like securing end 34 by which it may be attached to an article or piece of laundry.

It should be explained that these checks or markers are made in any desired number of individual sets, as many to a set as may be found practical and all bearing the same identifying number and the same combination of key end fingers. Each set bears a distinct combination of key end fingers so that when laundry pieces are attached to the markers or checks and carried by a carrier head or heads they will actuate the mechanism associated with one rack only, the one identified with the particular set of markers, and all pieces attached to markers of that set will be removed from the conveyor chain and deposited on that particular track.

Thus instead of marking the laundry pieces with unsightly ink markings to identify them according to the practise now common, each piece is attached to the safety-pin-like end of a check or marker, without further care as to its identity, and put through the usual laundry processes. After completion of the processes the tedium of assortment and assembly is completely avoided and it is only necessary to mount each piece promiscuously, by its key end, upon a carrier head and when each piece reaches the rack identified by its carrying marker it will be deposited onto that rack automatically.

A keeper and release arm 35 is pivoted as at 36 at the advance end of each casing and has mounted on its upper end a cam roller 37, the arm 35 being slotted at its center as at 38 to pass a stop and spring pin 39 which serves to hold it in its normal check or marker securing position, and is equipped at its lowermost end with a keeper finger 40 to engage the notched head 32 of the marker to secure it upon the carrier head against inadvertent removal.

The fingers 29 are carried at the lower ends of bolt 14 slidable vertically in bearings 42 provided in the casing and spring held, as at 43, to a downward position with the key fingers projected their maximum distance into the marker receiving slotway. At their upper ends the bolts carry cam heads 44 which project above the top of the casing through slotways 45, it being understood that the number of bolts and cam heads corresponds to the number of individual fingers comprising the key end of the checks or markers so that when the said end is inserted into the receiving slot, the key end fingers will engage the key fingers and project the cam heads beyond the top face of the carrier head in varying degrees of projection. See Figure 4.

A trip mechanism is associated with each rack and includes a casing 46 secured at 47 to the framing and which has mounted therein a rock shaft 48 carrying a notched head 49 having a lock notch 50 formed therein. The shaft projects beyond the casing at one side and carries a crank arm 51 having a trip arm portion 52, a slotted rack positioning arm 53, and an upper crank arm extension 54 engaged by a spring 55 which tends to throw the crank arm 51 downwardly and backwardly toward the approaching carrier heads.

A plurality of lock bars 56 (one for each cam head 44) are provided and are pivotally mounted at 57 in the casing and are each provided with a lock detent or trigger 58 adapted normally to rest in the notch 50 and hold the shaft 48 to its normal postion with the trip arm 52 just above the path of travel of and out

of engagement with the rollers 37 of the carrier heads.

As the carrier heads pass beneath the trip mechanisms their projected cam heads will engage and lift some of the lugs or triggers 58 out of their notches 50 but, until the proper key projected combination comes along the trip mechanisms remain untripped because all of the detents are not removed simultaneously. When the proper cam head projection combination comes along, all of the triggers will be released and the spring 55 functions to force the trip arm 52 downwardly to forcibly engage the roller 37, of the advancing carrier head and releases the keeper finger 40 and permits the marker or check to fall from the carrier head. See Figure 4.

The lock bars also have stop lugs 59 to limit upward movement by engagement with the rocker head. It should also be understood that the triggers or lock detents 58 are of varying length to be associated with the cam heads of the proper carrier head. See Figure 15.

The assembly racks 60 are in the nature of open track rails to receive the heads 32 of the markers and each includes a fixed section and a movable section normally out of the way of the passing carrier heads but automatically movable to position for receiving the pieces simultaneously with each release of a laundry piece from the conveying chain. See Figure 9.

The adjacent ends of the fixed and movable rack sections are mounted in bearing heads 61 secured to the under face of the lower longitudinal frame rail 5. The swingable sections are indicated as 63 and each thereof has its advance end bent upwardly to form an incline 64 terminating in a hook shaped open end 65 upon which the markers are adapted to be received. The marker heads 32 are preferably made round to present a minimum of engaging surface and thus facilitate free sliding thereof down the rack incline portion onto the rack proper.

An arm 66 projects from each movable rack section into the slotted end of the arm 53 of the associated trip mechanism so that the instant the trigger release occurs and the spring 55 functions the rack end 63, 65 is quickly moved to position for receiving the marker 31 which is released from its carrier head by the same movement. See Figure 9.

In order that an understanding may be had of the trip mechanism, reference is made to Figures 3 and 4 of the drawings. It will be assumed that a marker 31 has been deposited upon one of the movable rack members 62 and the arm 51 is in the dotted line position shown in Figure 4. Further movement of the carrier 24, in the direction indicated by the arrow in Figure 4, will cause a corresponding movement of the arm 51 by virtue of engagement of the trip arm 52 with the cam roller 37 of the carrier. The movement of the arm 51 will, of course, flex the spring 55, and also, such movement of the arm will cause rotation of the head 49 to properly aline the notch 50 with the detent 58 of the lock bars 56. When the notch 50 is in alinement with the detents 58, the lock bars will fall therein and hold the spring 55 under tension with the arm 53 and associated movable rack 62 out of the path of following carriers, but in position to be again actuated by a carrier bearing the proper cam heads.

The portion of each movable rack section 63 that projects into the head 61 has a crank arm 67 rigidly connected thereto and the head is cut-out or slotted as at 68 to permit movement of the said rack section toward an advancing carrier head. See Figures 9, 10 and 11.

Each crank arm 67 is slotted to receive the operating arm 69 pivoted at 70 to the plate 71 secured in vertical position on the extended framing. The arm 69 carries a detent 72 to engage the toothed periphery 73 of a dial 74 having numbering thereon at 75 arranged in sequence from zero to a sufficiently high number to embrace the number of pieces usually contained in laundry bundles. Each number is associated with an individual tooth and in the drawings, I have indicated thirty-two teeth and an even range of numerals.

Each dial is freely rotatable on a stud shaft 76 fixed in the plate 71 and an indicator hand 77 is fixed upon the shaft end and points to the numbers as they pass before its ends. Each time a piece of laundry is deposited onto the associated rack the dial is turned one tooth or number by the parts 67, 69, 70 and 72 and thus the progress of accumulation on the rack is checked and recorded.

An electric signal light 78 is mounted in a suitable socket on each support plate 71 and is connected in an energized circuit 79 including a contact 80 at zero on the dial and a cooperating contact 81 on the hand 77. The circuit is complete only when the contacts 80 and 81 are engaging and hence the signal light will not be lighted when the hand points to any number other than zero.

In practice the customer's bill with the key identification indication and billing data thereon may be mounted on the assembling rack identified by the key combination and an operator sets the dial so that the hand points to the number of pieces that must be assembled on the rack to complete the customer's bundle.

The mechanism now being in motion the carrier heads will be moved along and will freely pass the trip mechanism of the particular rack and the rack receiving end until a carrier head having a piece for that rack approaches which is properly "key set" to actuate the trip mechanism. The cam heads of this carrier will then actuate the trip mechanism, the piece will be released and

deposited onto the rack, and the dial will be moved reversely one notch to cause the indicator hand to point to the next or successively lower number indicating that there is now one less piece to be assembled to complete the order. When the last piece has been thus assembled the hand points to zero and the signal light is lighted to signify that the assembly is complete and the pieces may be removed from the rack and prepared for delivery.

Obviously this apparatus may be employed to assemble bundles as well as pieces, and it may be employed to assemble other articles than pieces of laundry.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the novel details of the manner of use, and the advantages of my invention will be readily understood by those skilled in the art to which it relates.

What I claim is:—

1. Apparatus of the character described comprising carriers, means to mount laundry pieces on the carriers, receiving racks, and means to deposit complementary laundry pieces onto certain racks, said racks each comprising a fixed portion, a movable portion normally out of position but movable into position at the proper time to receive a laundry piece from a certain carrier, and means to release the laundry piece from the certain carrier and move the said movable rack portion into position to receive it, and key positioned means carried by the carrier to actuate said releasing and moving means for the purposes specified.

2. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving means, trip devices to release the laundry pieces from the carriers, and deposit them onto the receiving means, and key controlled devices to associate each carrier with a certain receiving means only, said mounting means each having provision to distinctively mark the laundry piece carried thereby and a key portion to engage and set the key controlled devices.

3. Apparatus of the character described comprising carriers, trip devices, receiving means, sets of mounting devices each set identified with a certain receiving means adapted to be attached to pieces of laundry to identify them and mount them on the carriers, trip actuating devices carried by the carriers, and means on the mounting devices to set the trip actuating devices to actuate a trip device upon reaching a certain receiving means only, whereby laundry pieces may be mounted on the carriers promiscuously and trip released onto a certain receiving means only with the remainder of pieces attached to other mounting devices of the same set.

4. Apparatus of the character described, comprising carriers, an endless chain upon which the carriers are mounted at spaced intervals, trackways to guide movement of the carriers in an undeviating course, trip devices, receiving means, sets of mounting devices each set identified with a certain receiving means adapted to be attached to pieces of laundry to identify them and mount them on the carriers, trip actuating devices carried by the carriers, and means on the mounting devices to set the trip actuating devices to actuate a trip device upon reaching a certain receiving means only, whereby laundry pieces may be mounted on the carriers promiscuously and trip released onto a certain receiving means only with the remainder of pieces attached to other mounting devices of the same set.

5. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving racks including movable receiving ends, trip devices to release the laundry pieces and to move the rack receiving ends to position for receiving the released pieces, and means on the carriers to actuate the trip devices and move said movable rack sections and to reset said trip devices and return said rack sections to normal position.

6. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving means, trip devices to release the laundry pieces from the carriers onto the receiving means, and means on the carriers to actuate the trip devices and reset said devices after actuation, and key actuated means to adjust said actuation effecting means on the carriers whereby each said carrier will become associated with a certain receiving means only.

7. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving racks, trip devices to release the laundry pieces from the carriers onto the racks, said carriers being normally common to all of the racks, said trip devices each being associated with a single rack, and means to selectively adjust the carriers to association with any single selected rack for the purposes specified, said last named means including key adjusted cam heads, and selective key members to adjust the position of the cam heads.

8. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving racks, trip devices to release the laundry pieces from the carriers onto the racks, said carriers being normally common to all of the racks, said trip devices each being associated with a single rack, and means to selectively adjust the carriers to association with any single selected rack for the purposes specified, said last named means including key

adjusted cam heads, and selective key members to adjust the position of the cam heads, and said key members constituting part of the laundry piece mounting means.

9. Apparatus of the character described comprising traveling carriers, means to mount lanudry pieces on the carriers, receiving means, trip devices to release the laundry pieces from the carriers and deposit them onto the receiving means, said trip devices each including trip arms, a spring tending to force the arms in the release direction, a notched head and triggers to hold the arms inactive, and means on the carriers to release the triggers for the purposes specified.

10. Apparatus of the character described comprising traveling carriers, means to mount laundry pieces on the carriers, receiving means, trip devices to release the laundry pieces from the carriers and deposit them onto the receiving means, said trip devices each including trip arms, a spring tending to force the arms in the release direction, a notched head and triggers to hold the arms inactive, cam heads carried by the carriers, and means forming part of the piece mounting means to adjust the positions of the cam heads, said triggers having varied sized lock fingers to engage the notched head whereby the triggers of a trip device will be totally released by the adjusted cam heads of certain carrier heads only.

11. Apparatus of the character described comprising carriers, means to move and guide the carriers, means to mount laundry pieces on the carriers, receiving means, and trip devices to release the pieces onto the receiving means, said carriers each comprising a casing having a key end receiving slot, a plurality of key fingers in the slot, cam head equipped bolts movable in the casing, a control key insertible into the slot to project the cam heads above the casing in varying degrees of projection, and a pivoted release and bolting lever forming part of the piece mounting means, and said trip devices each comprising a housing, a notched head rockable in the housing, a release arm, a spring tending to force the release arm in the releasing direction, and a plurality of lock dog triggers having detents to engage the notched head and secure it in the inactive position and adapted to be released by certain combination projections of the cam heads only to release the triggers for the purposes specified.

12. Apparatus of the character described comprising carriers, means to move and guide the carriers, means to mount laundry pieces on the carriers, receiving means and trip devices to release the pieces onto the receiving means, said carriers each comprising a casing having a key end receiving slot, a plurality of key fingers in the slot, cam head equipped bolts movable in the casing, a control key insertible into the slot to project the cam heads above the casing in varying degrees of projection, and a pivoted release and bolting lever forming part of the piece mounting means, and said trip devices each comprising a housing, a notched head rockable in the housing, a release arm, a spring tending to force the release arm in the releasing direction, and a plurality of lock dog triggers having detents to engage the notched head and secure it in the inactive position and adapted to be released by certain combination projections of the cam heads only to release the triggers for the purposes specified, said release levers and said release arms being free to pass when the triggers are not released, and said release levers being positioned to reset the trip devices to their normal positions on continued movement of the carriers after they have actuated said trip devices.

13. Apparatus of the charcter described comprising carriers, means to move and guide the carriers, means to mount laundry pieces on the carriers, receiving means, and trip devices to release the pieces onto the receiving means, said carriers each comprising a casing having a key end receiving slot, a plurality of key fingers in the slot, cam head equipped bolts movable in the casing, a control key insertible into the slot to project the cam heads above the casing in varying degrees of projection, and a pivoted release and bolting lever forming part of the piece mounting means, and said trip devices each comprising a housing, a notched head rockable in the housing, a release arm, a spring tending to force the release arm in the releasing direction, and a plurality of lock dog triggers having detents to engage the notched head and secure it in the inactive position and adapted to be released by certain combination projections of the cam heads only to release the triggers for the purposes specified, said release levers and said release arms being free to pass when the triggers are not released, and said release levers being positioned to reset the trip devices to their normal positions on continued movement of the carriers after they have actuated said trip devices, said receiving means each having a movable receiving end normally out of the way of the carriers, and arms and rod connections between the release arm and the movable end of the receiving means whereby said ends will be moved into position to receive the laundry pieces as the trip devices are actuated and replaced to normal position when said trip devices are reset.

14. Apparatus of the character described comprising, in combination, a stationary frame, a traveling conveyor, a plurality of carrier devices mounted upon said conveyor, a plurality of markers each adapted to be secured to an article to be distributed, a plurality of tripping devices mounted upon said

frame, a plurality of receiving rack ends, means for actuating said tripping devices to release the markers at appropriate and predetermined stations, and an operative connection between each tripping device and the associated rack end to cause their simultaneous operation upon actuation of said tripping device whereby said rack end is swung to marker receiving position upon such actuation.

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