V. C. H. ELGY.

APPARATUS FOR SORTING OUT AND DELIVERING BODIES OR LIDS OF TINS OR THE LIKE.

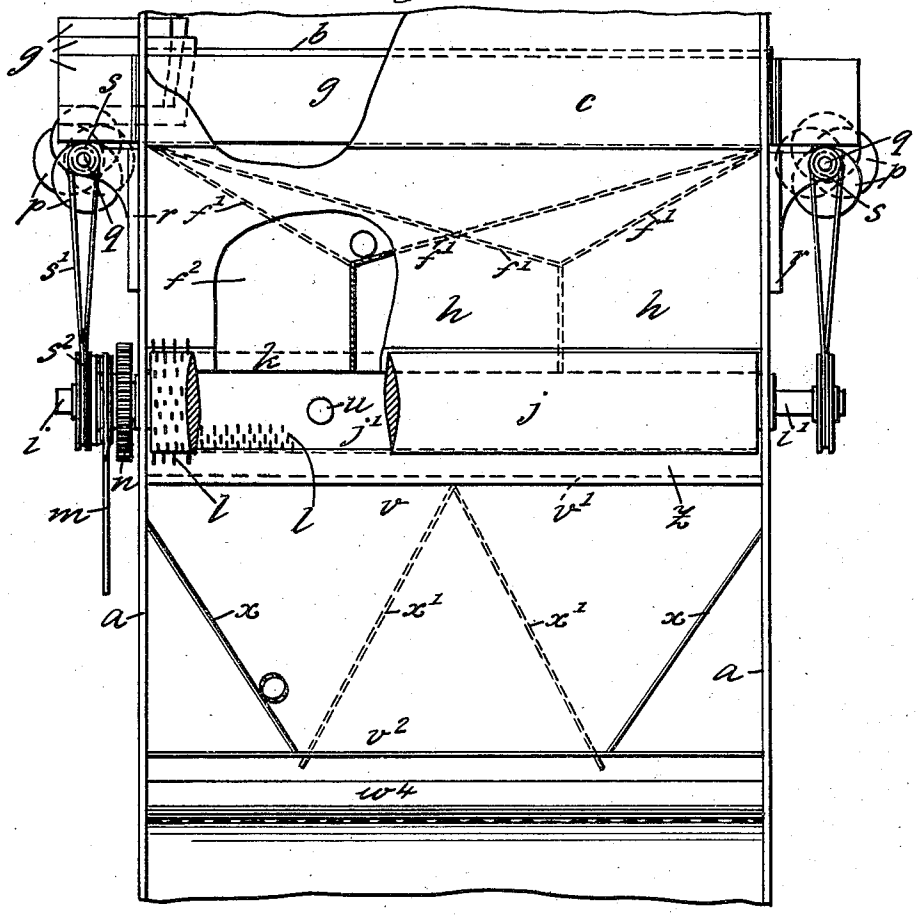
APPLICATION FILED JULY 31, 1920.

1,425,374.

Patented Aug. 8, 1922.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

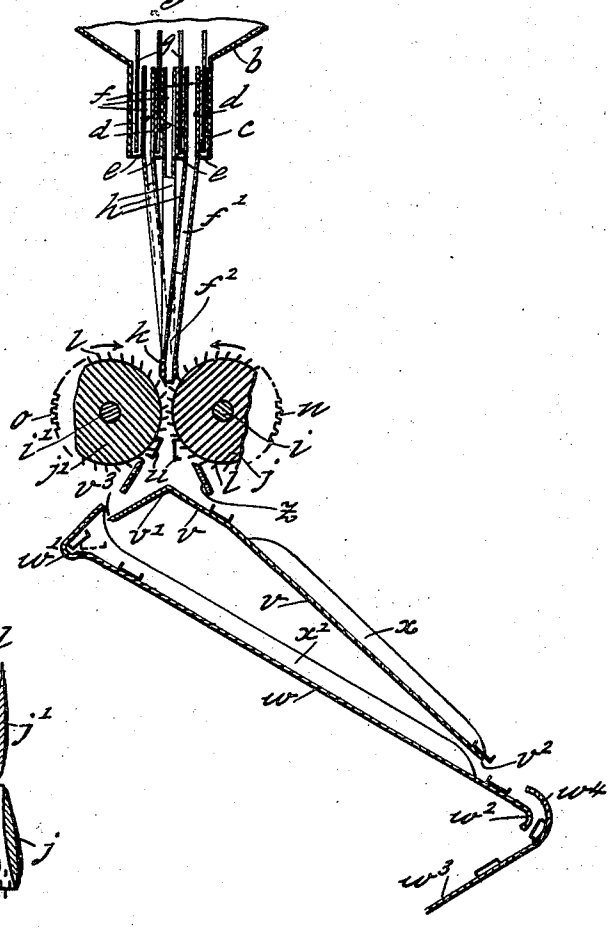
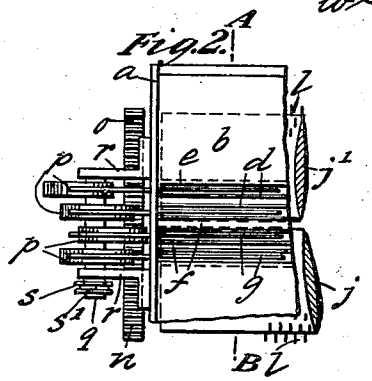


Fig. 2.



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APPARATUS FOR SORTING OUT AND DELIVERING BODIES OR LIDS OF TINS OR THE LIKE.

1,425,374. Specification of Letters Patent. Patented Aug. 8, 1922.

Application filed July 31, 1920. Serial No. 400,333.

To all whom it may concern:

Be it known that I, VALENTINE CHARLES HERBERT ELGY, a subject of the King of Great Britain, residing in Surrey, England, have invented certain new and useful Improvements in Apparatus for Sorting Out and Delivering Bodies or Lids of Tins or the like, of which the following is a specification.

My invention has for its object to provide an apparatus that is capable of extracting or liberating bodies or lids of tins or similar hollow-ware articles from an assemblage thereof in confused or higgledy-piggledy order, of turning each liberated article into a position with a desired end thereof uppermost, and discharging or laying the same onto a tray or trays or other conveying devices. Such apparatus is particularly suited for use in conjunction either with machines for filling substances into tins or similar containers which are subsequently closed by means of flanged lids, or with machines such as are described in my co-pending application for U. S. Patent, Serial No. 354,355 and are adapted to press lids on to the mouths of tins or other like containers.

An apparatus constructed according to my invention is illustrated in one of its forms in the accompanying drawings, in which Fig. 1 is a front elevation of the apparatus, parts being broken away; Fig. 2 is a part plan of the same, and Fig. 3 is a cross section taken on the line A—B in Fig. 2.

The apparatus as illustrated comprises, among other parts, a framing *a* which supports a hopper *b* for the reception of either the bodies or lids of the tins (according as bodies or lids are to be arranged in order), or other hollow-ware articles that are to be dealt with. Below the bottom of the hopper and running the full length thereof is a vertically depending walled-in portion *c* which is internally divided up by means of vertical partitions *d* into a number of passages *e* and slotways *f* arranged side by side alternately. In one or more of the passages I arrange a sliding shutter or blade-like member *g*. The slotways *f* lead or discharge below into a series of compartments *h* hereinafter referred to. Associated with the shutters is a suitable cam, eccentric or other appropriate mechanism which is arranged to reciprocate them in such a manner that they will rise and fall to a greater or less extent within the hopper *b* and among the assemblage of articles therein.

At a convenient distance below the passages *e*, in which the shutters *g* slide, are mounted in suitable bearings carried by the framing *a*, a pair of shafts *i* and *i'* to each of which is fixed a roll, the two rolls *j* and *j'* being disposed side by side and at a suitable distance or space apart.

On the peripheral surfaces of the rolls are provided a number of pins *l* or equivalent devices, that are preferably of a slightly yielding nature.

Appropriate power or manually-actuated means are provided for rotating the shafts *i* and *i'* and rolls *j* and *j'* at any desired speed. The mechanism shown in the drawings for rotating the shafts *i* and *i'* consists of a belt *m* that is adapted to be driven from any convenient source of power and to cooperate with fast and loose pulleys on the shaft *i* near one end thereof. On the shaft *i* is mounted a toothed wheel *n* that gears with a similar wheel *o* (Fig. 2) mounted on shaft *i'*.

The means for reciprocating the shutters or blades may be operatively connected with one or other of the roll shafts, or be independently operated. In the drawings such mechanism is shown arranged to be actuated from the roll shaft *i*, and it consists of a number of eccentrics *p* carried by a spindle *q* mounted in suitable bearings supported on a bracket *r* fixed to one end of the frame *a*. The spindle *q* also carries a pulley *s* arranged to be driven by a belt *s'* from a pulley s^2 on shaft *i*. It is preferred to arrange at the other end of the frame *a* similar mechanism to assist in reciprocating the blades as indicated by corresponding reference letters in Fig. 1.

Each of the above mentioned compartments *h*, into which the slotways *f* discharge, is for a portion or portions of its length formed with a sloping floor *f'*, the remaining bottom portion being open or unfloored and constituting outlets f^2. The compartments are so arranged that the outlets therefrom are in alignment and discharge either directly into the space between the pair of rolls or, as shown in the drawings, Fig. 3, into a guideway or channel *k* open at the top and bottom and located immediately above the said space.

The respective widths of the slots f, the compartments h and channel k are governed by the length between the two ends or the height of the articles to be dealt with. Such widths would be substantially the same and equal to, or a trifle larger than the said height.

If a number of bodies or lids of tins or like articles be placed in confused order in the hopper and the shutters be reciprocated, these latter as they rise out of the passages e below the bottom of the hopper, and project into the latter will engage with parts of some of the articles, and in so doing will tend to loosen the mass and turn the engaged articles edgewise, that is to say into positions wherein their longitudinal axes are substantially horizontal, the open mouths of the engaged articles facing in one axial direction or the other, that is to say facing one or other of the sides of the depending portion c. In this position the articles are free to fall down the adjacent slotways and into the compartments below. Some of the articles entering a slotway will fall on to its sloping floor down which they will roll or slide towards the outlet f^2 through which they will pass, along with others that drop from the top of the said slotway, directly into the outlet f^2, and fall into the open-ended channel k, if one be used, and thence between the rolls. The walls of the compartments and the channel keep the article with its axis substantially horizontal and at 90° to the axes of the rolls.

As an article, for instance a lid u, traverses the space between the rolls, the pins l on the rolls that are adjacent to the outside face of the end of the article will press against that face and tend to push the lid towards the other roll, the pins on which will enter or project into the interior of the lid towards the inside face of the end. The lid u as it drops further down becomes suspended from one or more of these pins, as indicated in Fig. 3, and is carried round by them as the roll rotates until a position is reached wherein the radial position of the pins becomes so inclined to the horizontal that the lid u becomes free to slide from off them and drop further down by gravity, check plates or combs z being arranged, if necessary, below the space between the rollers to guide the lids in their descent.

Below the two rolls i and i' is arranged a table or platform v, Fig. 3, which in section view at right angles to the axes of the rolls, is of inverted V-shape sloping downwardly in two directions. The ridge v' between the two slopes of the platform is disposed centrally below the space between the rolls at a distance dependent upon the dimensions of the lids or other articles.

The lids or other articles dropping from off the pins on one roll fall on to one slope, while those from off the pins on the other roll fall on to the other slope. As the bottom edges of the articles strike the sloping platform the articles commence to slide down one or other of the slopes assuming a position with the open end or mouth upwards.

The articles reaching the discharging edges v^2 and v^3 of the slopes of the platform v may be allowed to fall on to trays or other conveying devices which are not shown, but would be arranged to receive them on either side or end of the apparatus. The articles can, however, be discharged all at one side of the apparatus by providing an additional platform w, placed below the upper platform v and arranged to slope in the same direction as one of the sloping parts thereof, for instance, the right hand slope of platform v in Fig. 3, and to extend beyond the lower or discharging edge v^3 of the other slope of platform v to permit articles to drop from the latter slope on to the lower platform w.

In this case the slopes must be furnished with guide members x and x' that will serve to guide the sliding articles in their descent to the bottom or discharging edges thereof and keep the articles that descend one slope or side of the upper platform v separate from those that have descended from the other side whilst in the act of dropping from the final discharging edges of the platform.

In order that articles dropping from the discharging edge v^3 of platform v on to platform w may change their direction of movement and slide down the latter platform with the same end uppermost as when moving down the platform v towards the edge v^2, the upper edge w' of platform w is so shaped, that the articles in sliding off the edge v^3 will strike the part w', and in doing so will have the direction of their movement changed, the open ends of the articles remaining uppermost.

If it be desired to reverse or turn over the articles as they drop from the final platform discharging edge w^2, a further auxiliary platform w^3, Fig. 3, can be employed, the upper marginal portion or edge w^4 thereof being suitably shaped and in a manner to change the direction of movement of articles striking against it, and at the same time to cause them to turn over as shown in the said Fig., so that they are delivered by platform w^3 with their closed ends uppermost.

Having thus described the nature of the said invention, and the best means I know of carrying the same into practical effect, I claim:—

1. In apparatus for sorting hollow-ware articles from a confused assemblage thereof, arranging them in a position with a desired end uppermost and delivering same, the combination of a hopper for the assemblage

of articles having an outlet at its bottom, a vertically depending throat communicating at one end with the said outlet, partitions dividing the interior of the throat into a number of vertical passages and slotways alternately disposed, a reciprocating blade slidably mounted in each passage, means for reciprocating the blades in a manner to alternately enter and recede from the interior of the hopper, a series of compartments arranged below the slotways, each compartment communicating at its upper end with one of said slotways and having at its lower end a sloping floor and a discharge outlet and means for arranging said articles in the said desired position after they descend through the discharging outlets of the compartments and for directing them in the said positioned condition to a point of delivery.

2. In apparatus for sorting hollow-ware articles from a confused assemblage thereof, arranging them in a position with a desired end uppermost and delivering same, the combination of a hopper for the assemblage of articles having an outlet at its bottom, a vertically depending throat communicating at one end with the said outlet, partitions dividing the interior of the throat into a number of vertical passages and slotways alternately disposed, a reciprocating blade slidably mounted in each passage, means for reciprocating the blades in a manner to alternately enter and recede from the interior of the hopper, a series of compartments arranged below the slotways, each compartment communicating at its upper end with one of said slotways having at its lower end a sloping floor and a discharge outlet, a pair of horizontal oppositely disposed shafts, a roll carried by each shaft, the shafts being spaced apart to provide a vertical passageway between the rolls and in alignment with the compartment outlets to receive articles descending from said compartments, means for rotating the shafts, a stationary device below the rolls for positioning the articles with a desired end uppermost and delivering them, and pins extending radially from the rolls to engage and convey the articles through the passageway and deposit them on the positioning and delivering device.

3. In apparatus for sorting hollow-ware articles from a confused assemblage thereof arranging them in a position with a desired end uppermost and delivering same, the combination of a hopper for the assemblage of articles having an outlet at its bottom, a vertically depending throat communicating at one end with the said outlet, partitions dividing the interior of the throat into a number of vertical passages and slotways alternately disposed, a reciprocating blade slidably mounted in each passage, means for reciprocating the blades in a manner to alternately enter and recede from the interior of the hopper, a series of compartments arranged below the slotways, each compartment communicating at its upper end with one of said slotways and having at its lower end a sloping floor and a discharge outlet, a pair of horizontal oppositely disposed shafts, a roll fixed to each shaft, the shafts being spaced apart to provide a vertical passageway between the rolls in alignment with the compartment outlets, a guide below the said compartment outlets for directing articles descending through said outlets to said passageway, means for rotating the shafts, a stationary device below the rolls for positioning the articles with a desired end uppermost and delivering them, and pins extending radially from the rolls adapted to engage and convey the articles through the passageway and deposit them on the positioning and discharging device.

4. In apparatus for sorting hollow-ware articles from a confused assemblage thereof, arranging them in a position with a desired end uppermost and delivering same, the combination of a hopper for the assemblage of articles having an outlet at its bottom, a vertically depending throat communicating at one end with the said outlet, partitions dividing the interior of the throat into a number of vertical passages and slotways alternately disposed, a reciprocating blade slidably mounted in each passage, means for reciprocating the blades in a manner to alternately enter and recede from the interior of the hopper, a series of compartments arranged below the slotways, each compartment communicating at its upper end with one of said slotways and having at its lower end a sloping floor and a discharge outlet, a pair of horizontal oppositely disposed shafts, a roll fixed to each shaft, the shafts being spaced apart to provide a vertical passageway between the rolls in alignment with the compartment outlets, a guide below the said compartment outlets for directing articles descending through said outlets to said passageway, means for rotating the shafts, a stationary device below the rolls for positioning the articles with a desired end uppermost and delivering them, and pins extending radially from the rolls and adapted to engage and convey the articles through the passageway and deposit them on the positioning and discharging device, said device comprising a platform sloping in two directions from a ridge mounted centrally below said passageway for guiding the deposited articles in two directions to points of delivery.

5. In apparatus for sorting hollow-ware articles from a confused assemblage thereof, arranging them in a position with a desired end uppermost, and delivering same, the

combination of a hopper for the assemblage of articles having an outlet at its bottom, a vertically depending throat communicating at one end with the said outlet, partitions dividing the interior of the throat into a number of vertical passages and slotways alternately disposed, a reciprocating blade slidably mounted in each passage, means for reciprocating the blades in a manner to alternately enter and recede from the interior of the hopper, a series of compartments arranged below the slotways, each compartment communicating at its upper end with one of said slotways and having at its lower end a sloping floor and a discharge outlet, a pair of horizontal oppositely disposed shafts, a roll fixed to each shaft, the shafts being spaced apart to provide a vertical passageway between the rolls in alignment with the compartment outlets, a guide below the said compartment outlets for directing articles descending from the hopper and through said outlets to said passageway, means for rotating the shafts, a stationary device below the rolls for positioning the articles with a desired end uppermost and delivering them, and pins extending radially from the rolls and adapted to engage and convey the articles through the passageway and deposit them on the positioning and discharging device, said device comprising a platform sloping in two directions from a ridge arranged centrally below said passageway for guiding the deposited articles in two directions, and an auxiliary platform situated below the doubly sloping platform and sloping in the same direction as one of the slopes of the latter platform, the said auxiliary platform being adapted to receive articles discharged from one of the slopes of the said latter platform and guide the said articles in the same direction as the articles on the other slope thereof.

In testimony whereof I have signed my name to this specification.

VALENTINE C. H. ELGY.