Sept. 21, 1943. L. W. BUZBY 2,329,873

VIAL LENGTH SORTING MACHINE

Filed May 6, 1941 3 Sheets-Sheet 1

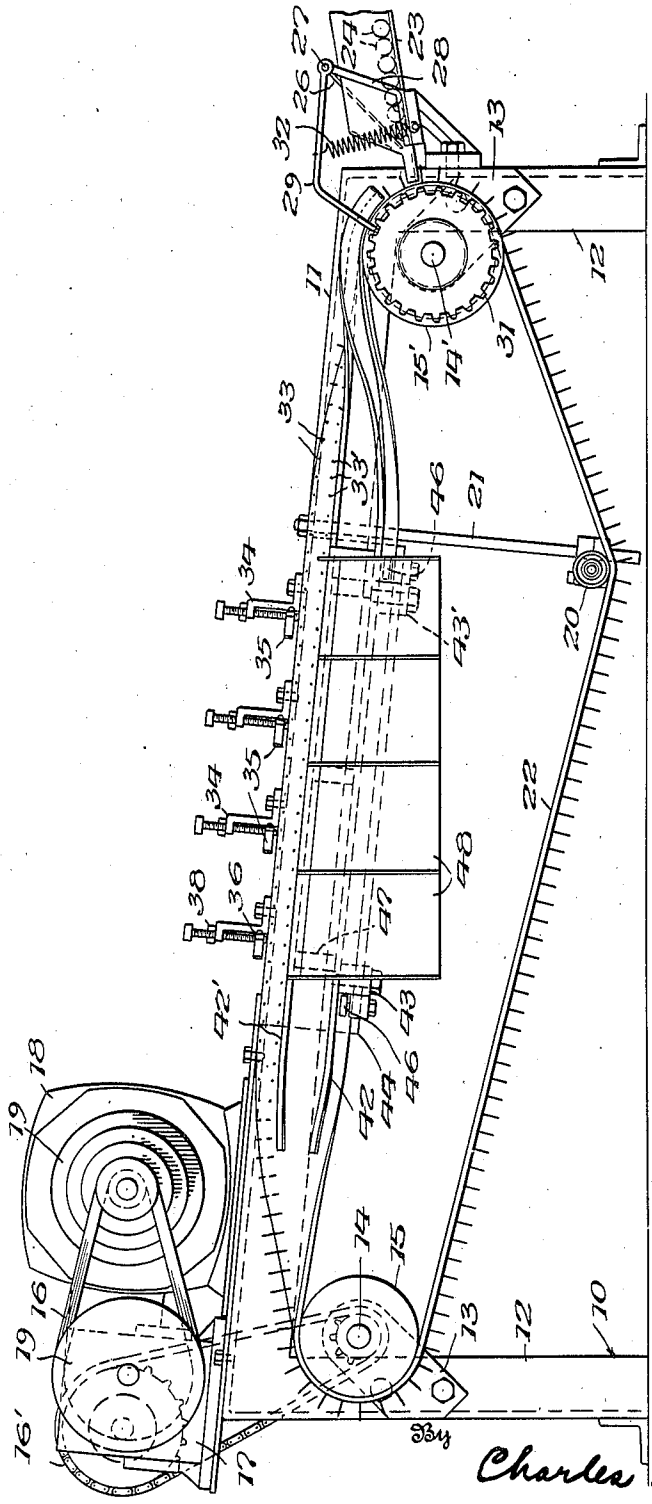


Fig. 1.

Inventor
LAWRENCE W. BUZBY

By Charles B. Belknap
Attorney

Sept. 21, 1943. L. W. BUZBY 2,329,873

VIAL LENGTH SORTING MACHINE

Filed May 6, 1941 3 Sheets-Sheet 2

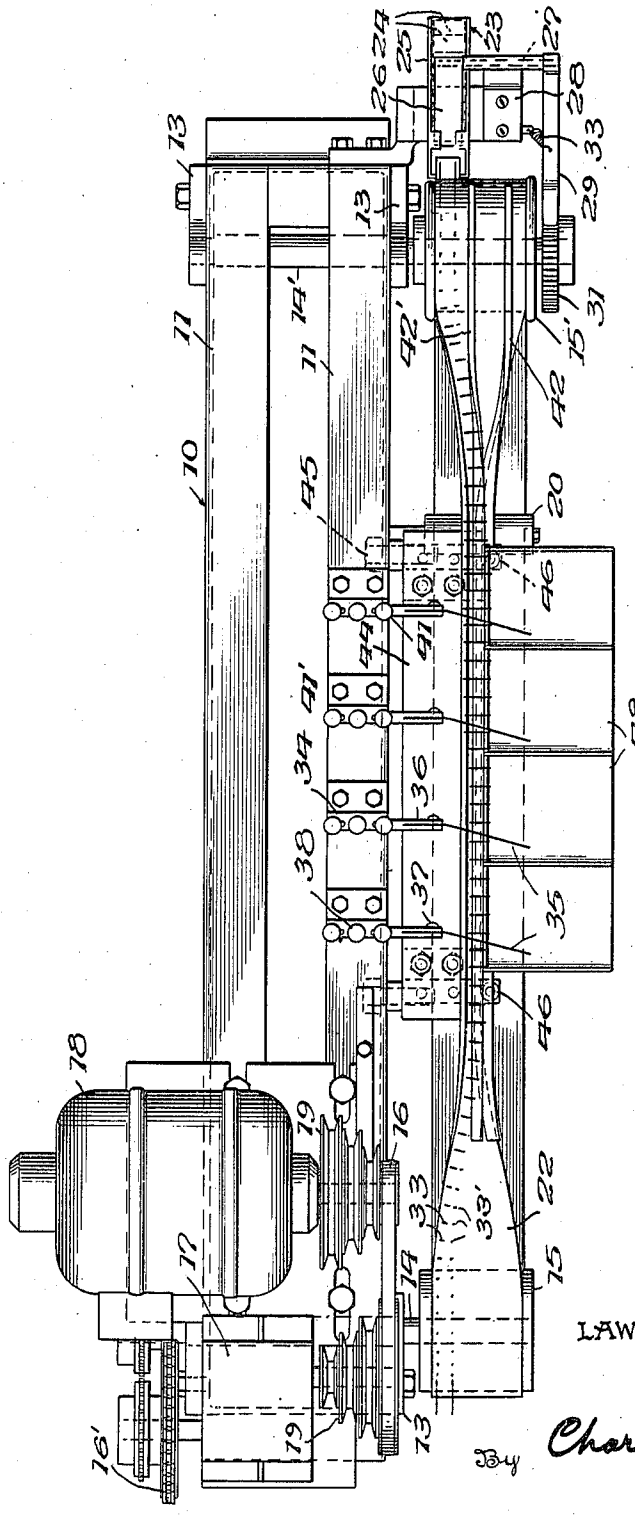


Fig. 2.

Inventor
LAWRENCE W. BUZBY

By Charles B. Beltnap
Attorney

Sept. 21, 1943. L. W. BUZBY 2,329,873

VIAL LENGTH SORTING MACHINE

Filed May 6, 1941 3 Sheets-Sheet 3

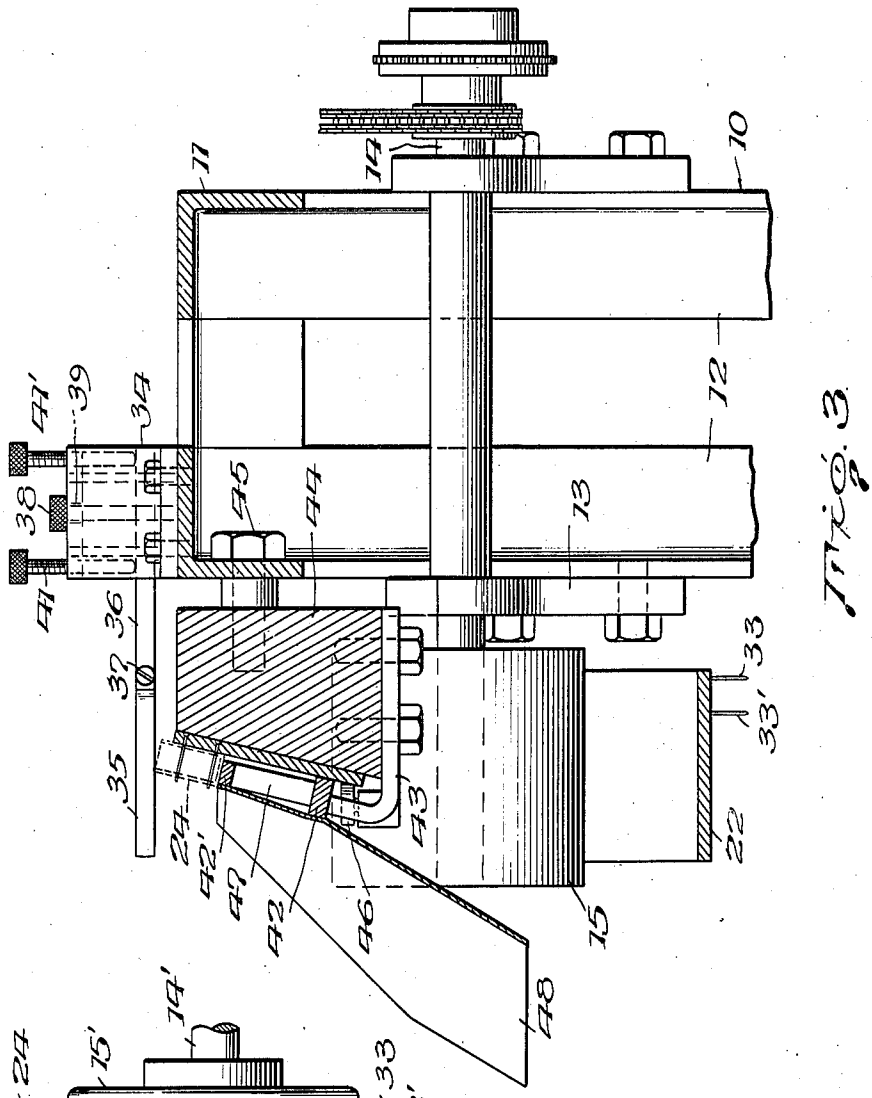


Fig. 3.

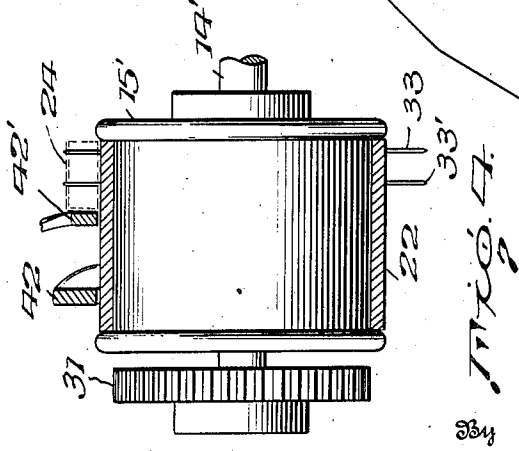


Fig. 4.

Inventor
LAWRENCE W. BUZBY

By Charles B. Belknap
Attorney

Patented Sept. 21, 1943

2,329,873

UNITED STATES PATENT OFFICE

2,329,873

VIAL LENGTH SORTING MACHINE

Lawrence W. Buzby, Millville, N. J., assignor to Kimble Glass Company, Vineland, N. J., a corporation of Illinois

Application May 6, 1941, Serial No. 392,171

4 Claims. (Cl. 209—90)

The present invention relates to a machine for sorting articles according to their lengths, and more particularly for separating glass vials of one or more predetermined lengths from others having lengths greater or less than those of the desired lengths.

Certain standards of lengths have been adopted for various reasons such, for instance, as adaptability for packing. For this reason, it is desirable that vials be sorted into lengths within predetermined limits. Some types of vials are fabricated from short lengths of glass tubing, the latter having been cut into the desired lengths from a relatively long tube. While the cutting apparatus is reasonably accurate, the short blanks may vary somewhat in length, or the vials may differ in length after shaping thereof, necessitating a sorting of the vials after they are tooled to final form. The present invention pertains to an apparatus for so sorting vials after they are shaped.

One of the objects of this invention is to provide a conveying apparatus capable of carrying a plurality of vials into engagement with a series of sorting devices, the latter being successively positioned to separate the vials into series of predetermined lengths, each series being separated from the others and deposited in suitable receptacles.

Another object of the invention is the provision of novel gauging means for separating vials of several lengths.

Other objects will be apparent from the following description of the apparatus taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of the machine for sorting blanks described herein;

Fig. 2 is a top plan view of the machine shown in Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 1; and

Fig. 4 is a section taken on line 4—4 of Fig. 1.

In the drawings, the frame of the machine is shown at 10 and comprises side members 11 and legs 12. Bracket plates 13 are bolted on legs 12 and form journals for shafts 14, 14', on which are keyed pulleys 15, 15'. Shaft 14 is driven through belt 16, chain 16', reductor 17, and motor 18, cone pulleys 19 providing for a variety of belt speeds. Belt tightener or idler 20 adjustably fixed on rod 21 insures engagement of the conveyor belt 22 with the pulleys.

At the forward end of the frame there is secured thereto an inclined hopper 23 adapted to contain a supply of vials 24 and having a channel portion 25 designed to guide the vials in contiguous and parallel relation towards a releasing gate 26. This gate is fast on shaft 27 supported in bracket 28. Also secured to shaft 27 is an arm 29 engageable with a toothed wheel or cam 31 on shaft 14'. As the latter shaft rotates, the arm 29 is rocked to lift gate 26 and release the vials in timed sequence. Spring 32 attached to arm 29 and bracket 28 normally urges arm 29 into engagement with cam 31.

Attached to conveyor belt 22 are parallel rows of pins 33, 33', the pins in each row being spaced a predetermined distance apart corresponding to the distance between the teeth on cam 31 so that as gate 26 is lifted a vial is deposited between adjacent sets of pins on the belt. Pins 33 in one row are transversely aligned with pins 33' in the other row, as shown in Fig. 2.

The gauging means for sorting the vials are mounted in a plurality of Z-shaped brackets 34 bolted on the frame. Each gauge comprises a thin flexible metal blade 35 held in a slotted bar 36 and secured therein by a screw 37. Bolt 38 passing freely through an aperture 39 in the upper flange of bracket 34 is threaded into bar 36 so that by turning bolt 38 the height of bar 36 may be varied. Further to secure bar 36 in adjusted position are bolts 41, 41', threaded into the upper flange of bracket 34, the lower ends of these bolts bearing against opposite ends of bar 36. It is obvious that, by turning bolts 38, 41, 41', the height of each blade 35 may be varied within desired limits and adjusted accurately to engage vials having lengths greater than the length for which the gauge is set.

It will be seen from the drawings that the face of that portion of the conveyor belt passing over the pulleys and idler is horizontal. During the gauging stage, however, the belt 22 is so twisted that the face of the belt is substantially vertical in that portion of its course between the pulleys. The means for giving a twist to the belt comprise a pair of guide bars 42, 42' engaging the belt and so bent that one edge of the belt is lowered below the tops of the pulleys and the opposite edge thereof elevated above the tops of the pulleys. Guide bar 42 is welded to a pair of straps 43, 43', bolted to a block 44, the latter forming a rest for the rear face of the conveyor belt and being secured to the frame by bolts 45. It should be noted that bar 42 is so spaced from block 44 that the conveyor belt is held against the block for sliding engagement thereover. Further to guide the belt are a pair of rollers 46 so

spaced laterally from the block that they hold the belt against block 44. Bar 42' is welded to spacers 47 which in turn are welded to bar 42. Bar 42' not only acts as a guide for the belt, but also provides a shelf on which the vials rest and slide as they are carried therealong by the pins on the conveyor belt. Secured to bars 42, 42' are separating chutes 48 underlying the gauging blades 35.

The operation of the machine is as follows: Vials 24 are placed in hopper 23 from which they roll down the channel 25 to gate 26 which releases the blanks one at a time. Each blank is picked up by a pair of pins on the conveyor belt and turned by the latter to a substantially upright position to be carried along upper guide bar 42'. The gauge blades are set at several heights, being successively higher from the hopper end of the machine toward the discharge end thereof. The longest of the vials are engaged by the first blade and tipped into the underlying chute. Those vials not engaged by the first blade pass thereunder. Each blade removes vials depending on their lengths so that the vials are sorted into batches, those in each batch being approximately the same length. It is thus possible to separate vials which fall within prescribed limits from those the length of which is greater or less than the dimensions required by the trade.

The machine has been described in some detail, but it is to be understood that changes therein may be made without departing from the principles of the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Apparatus for separating glass vials of varying lengths comprising a belt conveyor, means projecting from said belt for spacing and maintaining the vials in parallel relation thereon, a pair of spaced horizontally disposed pulleys supporting said belt in a portion of its course, a guide member supporting the face of said belt in a substantially vertical position in another portion of its course, means for guiding said belt to turn the face thereof from its horizontal position to its vertical position and for holding said belt against said guide member, means for depositing the vials on a horizontal portion of said belt, and means positioned above the vertical portion of the belt and engageable with vials of a predetermined length to remove vials so engaged from the belt.

2. Apparatus for separating glass vials of varying lengths comprising a belt conveyor, means projecting from said belt for spacing and maintaining the vials in parallel relation thereon, a pair of spaced horizontally disposed pulleys supporting said belt in a portion of its course, a guide member supporting the face of said belt in a substantially vertical position in another portion of its course, a plurality of twisted bars for guiding said belt to turn the face thereof from its horizontal position to its vertical position and for holding said belt against said guide member, means for depositing a single vial on the horizontal portion of said belt between each pair of said projecting spacing means, and spaced abutments positioned above the vertical portion of the belt and engageable with progressively shorter vials to remove vials so engaged from the belt.

3. Apparatus for separating glass vials of varying lengths comprising a belt conveyor, means projecting from said belt for spacing and maintaining the vials in parallel relation thereon, means for guiding said belt with its face in a substantially horizontal position in a portion of its course and in a substantially vertical position in another portion of said course, certain of said guiding means acting as a support for the vials, means for depositing vials on said belt, and a plurality of means positioned above the vertical portion of said belt at predetermined distances above said support and engageable with progressively shorter vials successively to remove vials so engaged from the belt.

4. Apparatus for separating glass vials of varying lengths comprising a belt conveyor, means projecting from said belt for spacing and maintaining the vials in parallel relation thereon, means for guiding said belt with its face in a substantially horizontal position in a portion of its course and in a substantially vertical position in another portion of its course, said guiding means including a pair of spaced twisted bars, means for depositing the vials on a horizontal portion of said belt, one of said bars serving as a support for the vials when the face of the belt is in its vertical position, and means positioned above the vertical portion of the belt and engageable with vials of a predetermined length to remove vials so engaged from the belt.

LAWRENCE W. BUZBY.