May 23, 1939. M. QUAMMA 2,159,049

CAN ALIGNING MEANS

Filed June 26, 1937 3 Sheets-Sheet 1

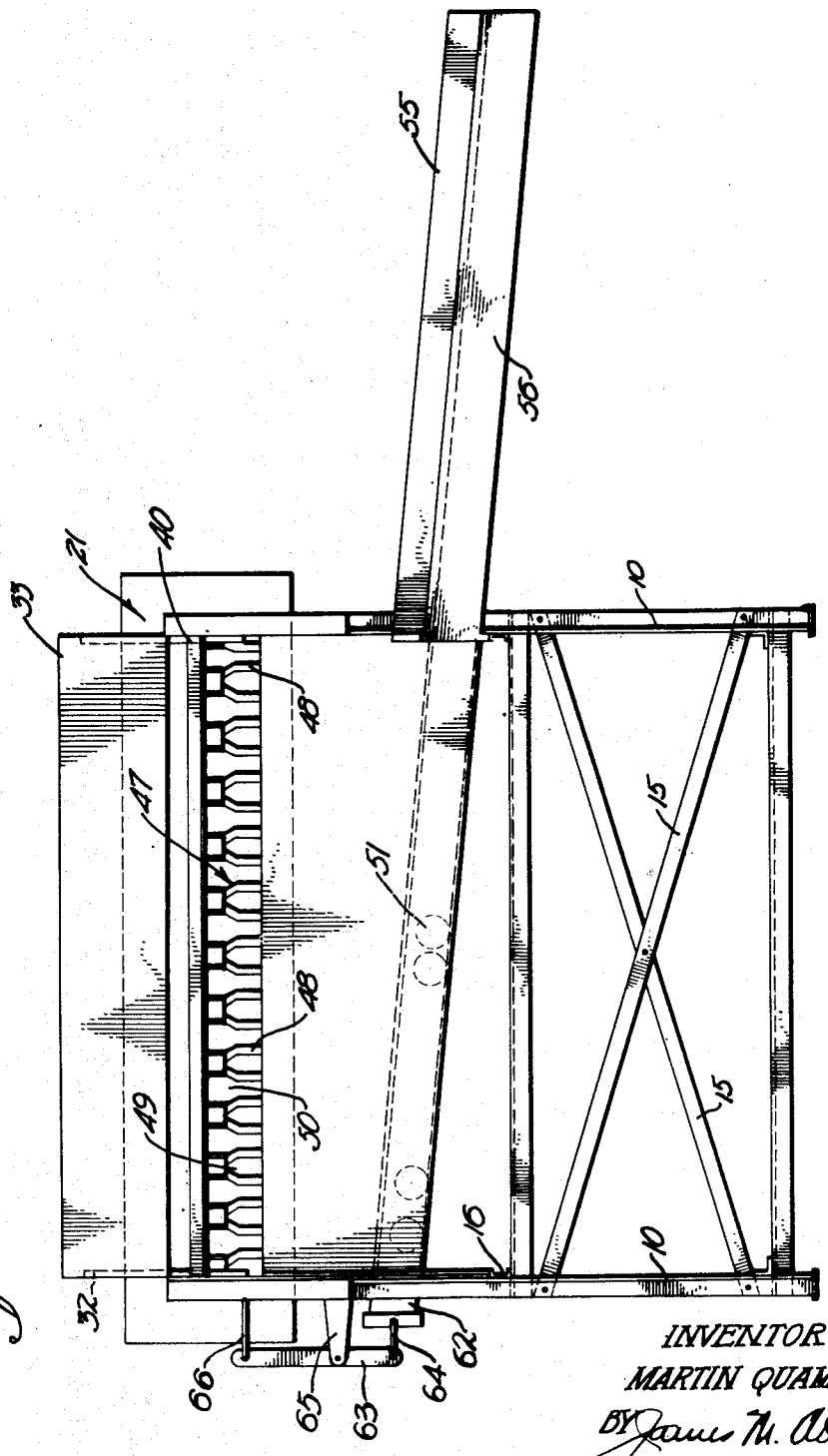


Fig. 1.

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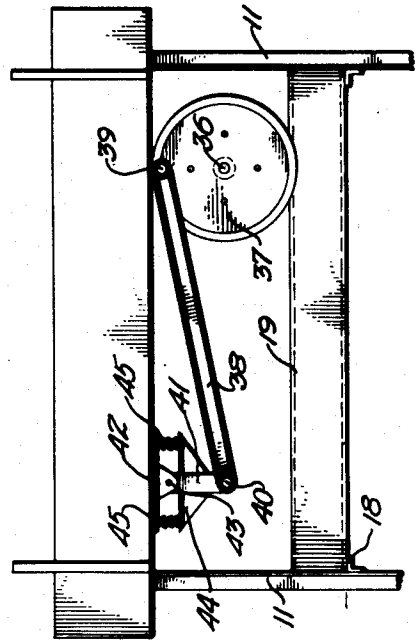


Fig. 1

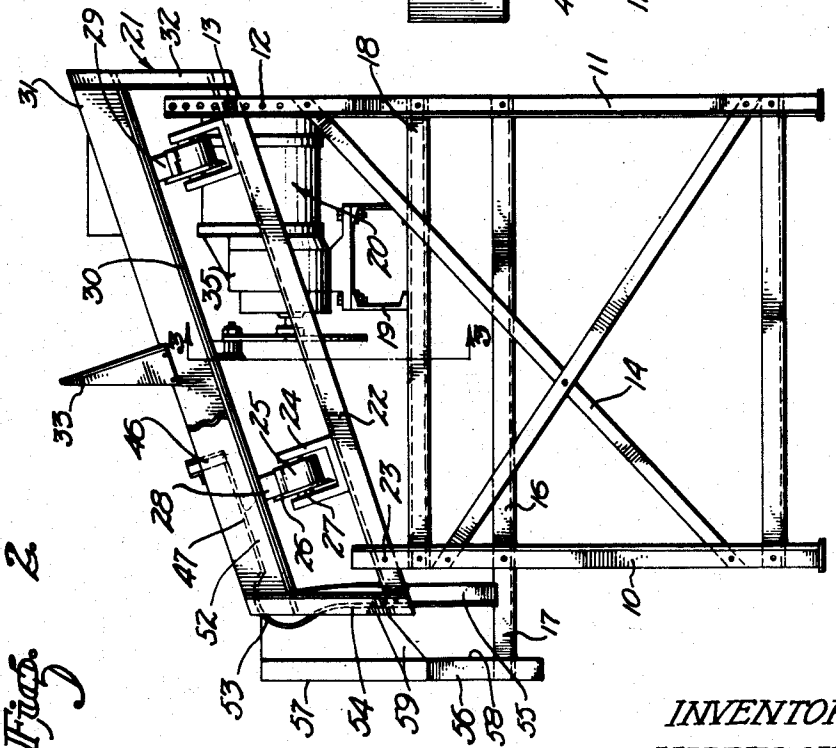


Fig. 2

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Fig. 5

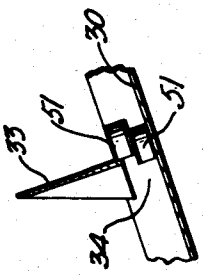


Fig. 6

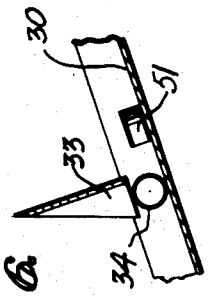


Fig. 7

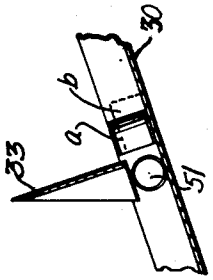
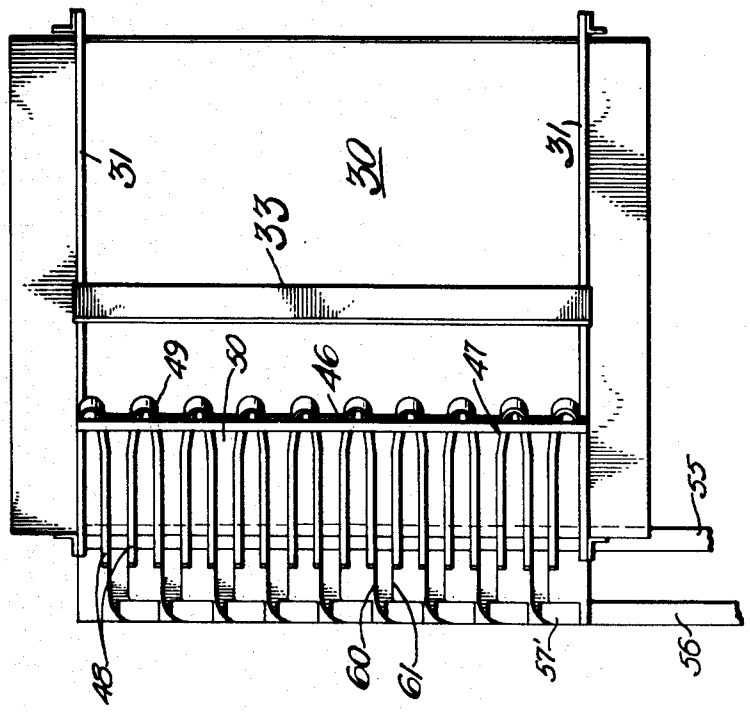


Fig. 4



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2,159,049

CAN ALIGNING MEANS

Martin Quamma, San Diego, Calif.

Application June 26, 1937, Serial No. 150,586

16 Claims. (Cl. 198—33)

This invention relates to can machinery, and particularly pertains to can aligning means.

During the procedure followed in canning various products, it is necessary to arrange the cans so that they will be carried properly through a can labeling machine and also so that they may be properly packed in cartons or boxes. Usually the cans are in carrying baskets or containers and lie at random as fed thereinto so that in order to place them in runways to permit them to roll and flow freely through the machine, or to pack them in containers, it is necessary to do this by hand. This requires the employment of a large amount of relatively unskilled labor which pick the cans up and arrange them properly, either for packing or for rolling through the runways to and from various machines. It is the principal object of the present invention to provide means whereby the cans may be placed in a machine in random arrangement and within which machine the cans will be classified and aligned so that they will all be in the same final position, in which position they may continuously travel along runways to packing, labeling, in other suitable types of machine.

The present invention contemplates the provision of a hopper or a table on to which cans may be poured, said table being equipped with means for arranging the cans in a single layer over the surface thereof and to thereafter be classified as cans standing edgewise or standing on their end. The cans then passing through aligning means within which the classified cans will be placed in one position to be thereafter moved from the machine.

The invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a view in end elevation showing the complete machine with which the present invention is concerned, and particularly indicating the discharge end of the machine.

Fig. 2 is a view in side elevation showing the complete machine.

Fig. 3 is a view in vertical section through the machine as seen on the line 3—3 of Fig. 2 indicating means for vibrating the table.

Fig. 4 is a view in plan showing the top of the machine and its classifying means.

Fig. 5 is a fragmentary view in section and elevation showing the means for placing the cans in a single layer on the table, irrespective of their arrangement when delivered on to the table.

Fig. 6 is a fragmentary view similar to Fig. 5 showing the manner in which the cans pass along the table after having been arranged in a single layer.

Fig. 7 is a view similar to Fig. 6 showing the manner in which tall cans are arranged in a single layer on a table.

Referring more particularly to the drawings, 10 indicates a pair of front legs of a base structure. 11 indicates a pair of rear legs of a base structure. The rear legs are longer than the front legs and are formed with a plurality of perforations 12 to receive a fastening bolt 13 by which the support structure of the device may be adjusted with relation to the horizontal. The front and rear legs are connected by end braces 14 and are cross-connected by braces 15. Horizontal frame members 16 are secured to the front and back legs and overhang the forward end of the frame structure to provide a runway support 17. Secured to the legs above the horizontal frame elements 16 are horizontal frame members 18 which carry frame channels 19 providing a mounting for a driving motor 20, the purpose of which will be hereinafter described. Carried at the upper ends of the legs 10 and 11 is a table frame structure 21. This includes inclined frame elements 22 pivoted upon pins 23 to the front legs 10 and fastened to the rear legs 12 by the bolts 13. Mounted upon the frame elements 22 are bearing members 24 which carry rollers 25. These rollers have a flange 26 along their lowermost sides and are rotatably supported upon trunions 27. Extending transversely of the rollers and resting upon their circumferential edges are rails 28 and 29 which are secured to the end face of a vibrating table 30. The vibrating table is designed to vibrate horizontally and laterally of the machine. End frame members 31 occur at opposite ends of the table and are supported by uprights 32. Mounted upon the frame members 31 is a fixed gate 33, which extends upwardly from the frame members and is spaced from the upper surface of the table 30 to provide a throat 34 through which cans must pass in a single layer as they travel from the feeding bin or hopper to the classifying structure. By reference to Fig. 2 it will be seen that the gate 33 is disposed substantially half-way down the length of the table so that a relatively large volume of cans may be deposited on to the portion of the table above the gate.

The table is vibrated by means of the motor 20 acting through a reduction gear 35 which drives the shaft 36 extending horizontally and carrying a crank disc 37. The crank disc stands in a

vertical plane and has connected to it a pitman rod 38 which is pivotally secured to the disc 37 by a pin 39. The opposite end of the pitman rod 38 is connected by a pin 40 to shackle members 41 which are attached to the under face of the table 30 by a bracket 42 carrying a pivot pin 43. The shackles 41 carry wings 44 which extend laterally and in spaced relation to the base of the bracket 42. Interposed between the wings and the bracket upon opposite sides of the pivot 43 are compression springs 45 which cushion the vibrating action of the driving mechanism.

Extending transversely of the table 30 and supported by the end frame members 31 is a cross-rail 46. This rail is positioned a distance above the lower edge of the table 30 to carry segregating bars 47. The bars 47 are more particularly shown in Fig. 4 of the drawings where it will be seen that they are substantially U-shaped having a pair of spaced parallel legs 48 terminating at their upper ends in a V-shaped crotch 49. The V-shaped portions provide an entering throat 50 between the adjacent members 47 and into which throat cans 51 may roll. The straight legs 48 of adjacent guide members 47 are spaced apart a distance to accommodate the thickness of a rolling can 51. The segregating bars 47 are spaced above the floor 30 as shown in Fig. 2 of the drawings to form a throat 52, which throat is greater than the height of a can when lying flat and is less than the diameter of a can when rolling. The result will be that the bars 47 will segregate the cans which are rolled on their circumference and the cans which are lying flat on their ends. The rolling cans will pass through the throats 50 between the segregating bars and the cans lying flat will slide along the floor 30 and beneath the segregating bars 47. The ends of the legs 48 of the segregating bars are curved as indicated at 53 in Fig. 2 and then extend downwardly as indicated at 54 to lie along the plane of the outer edge of a can chute 55. The curved portions 53 of the legs 48 will cause the cans which are sliding along the floor 30 to be turned on to their edges so that they will roll along the chute 55. Disposed in spaced relation to the chute 55 and outwardly from the end of the machine is a can chute 56. This chute has an outer vertical wall 57 and an inner wall 58. An inclined floor 59 spans the space between the chute 55 and chute 56 and is formed with can openings 57'. Deflector members 60 and 61 form continuations of the throat between the legs 48 of the segregating bars and are curved so that the cans passing through these throats will be turned at right angles to their path of travel and will fall into the openings 57' and then pass into the chute 56. If desired a sliding trough 62 may be mounted within chutes 55 or 56, the troughs being connected to a lever 63 by a link 64. The lever is mounted upon a bracket 65 carried by the frame and its free end is connected by a link 66 with the vibrating table 30 so that a rolling motion may be imparted to the cans to cause them to flow along the chute.

In operation of the present invention a quantity of cans or single cans in succession may be delivered on to the portion of the floor 30 of the machine occurring above the gate 33. The cans may fall on to the machine in a stacked position as indicated in Fig. 5, where it will be seen that one can is stacked upon the other. During this time the table 30 is vibrated horizontally by the driving action produced by the motor 20, the disc 37 with its pitman rod 38, and the link mechanism 41. This tends to agitate and disturb the cans in their arrangement upon the table 30 and in the particular case shown in Fig. 5 of the drawings, will cause the lowermost can to slide from beneath the uppermost can. It will be seen that the uppermost can is retarded in its movement by engaging the gate 33. The lowermost can which lies flat on the table will pass through the throat 34 and on down the table beneath the segregating bars 47 to thereafter fall into the chute 55. The rolling cans as indicated in Fig. 6 will roll along the floor 30 beneath the gate 33 and will find their way into the throats 50 between the segregating bars. They will then rapidly roll downwardly along the floor and jump the gap occurring between the chutes 55 and 56, after which they will be turned by the member 60 and will find their way into the chute 56 through the openings 57'.

In the example shown in Figs. 5 and 6 of the drawings, the diameter of the cans is greater than their height. It will be evident that in some instances the height of the cans will be greater than their diameters, as shown in Fig. 7. In this case a can, such as indicated at *a* in Fig. 7 will encounter the gate 33 and will be tilted until it falls on its side, as indicated at *b* in Fig. 7, after which it may slide or roll down the table 30 to the segregating bars 47. It is to be understood that while the invention here shown is illustrated as being particularly adapted to align circular cans, that it may also be used to align non-circular cans, such as square and oval cans which will slide on their sides as well as on their ends.

It will thus be seen that the apparatus here disclosed provides means whereby large quantities of cans may be rapidly fed into a machine, segregated, classified, and arranged in a uniformly aligned position to move from the machine to various other stations or machines.

It will further be seen that the entire operation is automatic, and that it is carried out without in any wise injuring the cans or mutilating their labels.

While I have shown the preferred form of my invention, as now known to me, it will be understood that various changes might be made in the combination, construction, and arrangement of parts, by those skilled in the art, without departing from the spirit of the invention as claimed.

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

1. A can aligning device comprising a table on to which cans may be deposited in random arrangement, and over which they may travel, means for arranging the cans in a single layer upon the table as they travel, some of said cans assuming positions standing on end and other of said cans lying on their sides, and means for separating the cans which stand on their ends from the cans which lie on their sides, and means for disposing all of said cans in separate rows, the cans of each row being in alignment.

2. A can aligning device comprising a table upon which cans may be deposited in random arrangement and over the surface of which said cans may move, means for vibrating the table to cause movement of cans over the surface thereof, a gate structure through which said cans must pass while traveling over said table surface and by which the cans will be arranged in a single layer with the cans of one group standing on their ends and the cans of another group lying on their sides, means for separating the cans which are moving across the table surface while

resting upon their ends from the cans which are moving across the table surface while resting upon their sides, and means for disposing both groups of cans in separate rows, the cans of each row being in alignment.

3. A can aligning device comprising a table upon which cans may be deposited in random arrangement and over the surface of which said cans may move, means for vibrating the table to cause movement of cans over the surface thereof, a gate structure through which said cans must pass while traveling over the table surface and by which the cans will be arranged in a single layer with some of the cans standing on their ends and others lying on their sides, means for separating the cans which stand upon their ends from the cans which rest upon their sides, and means for disposing the cans of both groups in separate rows, the cans of each row having an edgewise position of alignment.

4. A device for aligning cans in an edgewise position which comprises an inclined table at the upper end of which cans may be deposited in random arrangement and over the surface of which the cans may move to be discharged from the lower side thereof, a gate at a point in the length of the table from its upper to its lower edge and by which the cans will be arranged in a single layer over the surface of the table with some of the cans standing on their ends and others resting on their edges, means acting to vibrate the table in the plane thereof whereby to motivate the cans, means adjacent the lower edge of the table to segregate the cans into two classes, those standing on their ends and those resting on their edges, and means for disposing the cans of each class in separate rows and in edgewise position of alignment.

5. A device for aligning cans in an edgewise position which comprises an inclined table at the upper end of which cans may be deposited in random arrangement and over the surface of which the cans may move to be discharged from the lower side thereof, a gate at a point in the length of the table from its upper to its lower edge and by which the cans will be arranged in a single layer over the surface of the table, some of said cans standing on end and others on their edges, means acting to vibrate the table in the plane thereof whereby to motivate the cans, means adjacent the lower end of the table to segregate the cans into two classes, those standing on their ends and those resting on their edges, and means for disposing the cans of each class in separate rows wherein they occupy edgewise positions.

6. A device for aligning cans in an edgewise position which comprises an inclined table at the upper end of which cans may be deposited in random arrangement and over the surface of which the cans may move to be discharged from the lower side thereof, a gate at a point in the length of the table from its upper to its lower edge and by which the cans will be arranged in a single layer over the surface of the table, some of said cans standing on end and others resting on their sides, means acting to vibrate the table in the plane thereof whereby to motivate the cans, means adjacent the lower edge of the table to segregate the cans into two groups, those standing on end and those resting on their sides, said means comprising segregating bars under which one group of cans will pass and between which the other group of cans will pass, and means receiving the cans of each group and placing them in separate rows, the cans of each row being in aligned position.

7. A device for aligning cans which are of greater diameter than height, which device comprises a table on to which said cans may be fed, means for disposing said cans in a single layer upon the table with some of said cans standing on edge and the others standing on end, means for inducing movement of the cans across the table, means for classifying the cans into a group comprising the cans standing on edge and a group of cans standing on end, and means for disposing said groups of cans in separate rows so that the cans of each row will be placed in alignment.

8. A can aligning device comprising a frame, a wall on said frame upon which cans may be deposited in random arrangement, means for vibrating said wall to cause movement of cans over the surface thereof, means associated with said frame through which said cans pass while traveling over said wall surface, whereby said cans will be arranged in a single layer with the cans of one group standing on end and the cans of another group lying on their sides, means for separating the cans of the first mentioned group from the cans of the second mentioned group, and means for disposing the cans of both groups in separate rows, with the cans of each row in alignment.

9. A can aligning device comprising a supporting frame, a table on said frame upon which cans may be deposited in random arrangement, means for adjusting the inclination of said table, means for vibrating said table to cause movement of said cans over the surface thereof, means for arranging said cans in a single layer on said table with the cans of one group standing on end and the cans of another group laying on their sides, means for separating the cans of the first group from the cans of the second group, and means for disposing the cans of said groups in separate rows with the cans of each row in alignment.

10. A can aligning device comprising a supporting frame, a table mounted for reciprocation on said frame, said table being adapted to receive cans deposited in random arrangement thereon, means for reciprocating said table, means for arranging the cans in a single layer upon said table with some of said cans standing on end and other of said cans lying on their sides, means for separating the first mentioned group of cans from the last mentioned group of cans, and means for disposing the cans of said groups in separate rows with the cans of each row in alignment.

11. A can aligning device comprising a primary supporting frame, a secondary frame connected to said main frame, a table mounted for movement on said secondary frame, said table being adapted to receive cans deposited in random arrangement thereon, means for arranging the cans in a single layer on said table with some of said cans standing on end and other of said cans resting on their sides, means for adjusting said secondary frame so as to change the inclination of said table, means for vibrating said table to cause movement of said cans over the surface thereof, means for separating the cans standing on end from the cans resting on their sides, and means for disposing the cans in separate rows with the cans of each row in alignment.

12. A can aligning device comprising a frame, a table mounted for reciprocation on said frame, said table being adapted to receive cans de-

posited in random arrangement thereon and over which they travel, means for arranging the cans in a single layer on said table with some of said cans forming a group resting on their sides, means for reciprocating said table so as to impart movement to said cans, means for separating the cans of one group from the cans of the other group, means for adjusting the inclination of said table, and means for disposing the cans of said groups in separate rows with the cans of each row in alignment.

13. A can aligning device comprising a main frame, a secondary frame connected to said main frame, a table mounted for reciprocation on said secondary frame, said table being adapted to receive cans deposited in random arrangement thereon and over which said cans may move, means for reciprocating said table so as to cause movement of the cans over the surface thereof, a gate structure associated with said table and through which said cans must pass while traveling over said surface so as to be arranged in a single layer with cans of one group standing on end and cans of another group laying on their sides, means for separating the cans of the first group from the cans of the second group as they are moving across said table surface, and means for disposing both groups of cans in separate rows with the cans of each row in alignment.

14. A can aligning device comprising a main frame, a secondary frame mounted on said main frame, a table movable on said secondary frame upon which cans can be deposited in random arrangement, means for imparting movement to said table to cause said cans to gravitate over the surface thereof, means for arranging said cans in a single layer on said table with some of said cans resting on end and the others resting on their sides, means for separating the cans of the first mentioned group from the cans of the second mentioned group, means for disposing the cans of both groups in separate rows with the cans of each row in alignment, and means actuated by the movement of said table for imparting movement to the cans in one or the other of said rows.

15. A device for aligning cans having greater diameter than height comprising a frame structure, a table adapted for movement on said frame structure, said table having a surface on which cans may be delivered, some of said cans standing on edge and others standing on end, means for disposing the cans in a single layer upon said table surface, means for imparting movement to said table so as to cause said cans to move across said table, means for separating the cans standing on edge from the cans standing on end, and delivery means for delivering the cans in separate rows with the cans of each row in alignment.

16. A device for aligning cans comprising a frame structure, a table mounted for reciprocation on said frame structure, said table having a surface on which may be deposited cans in random arrangement, with the cans of one group standing on end and the cans of another group resting on their sides, means for arranging said cans in a single layer on said table surface, means for separating the cans of one group from the cans of the other group, means for reciprocating said table, and chute means carried by said frame and adapted to receive the cans from said separating means and deliver the same in separate rows to a point of delivery.

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