Feb. 3, 1942. T. CHIAPPE 2,271,997

CAN ALIGNING DEVICE

Filed April 8, 1939 2 Sheets-Sheet 1

Fig. 1.

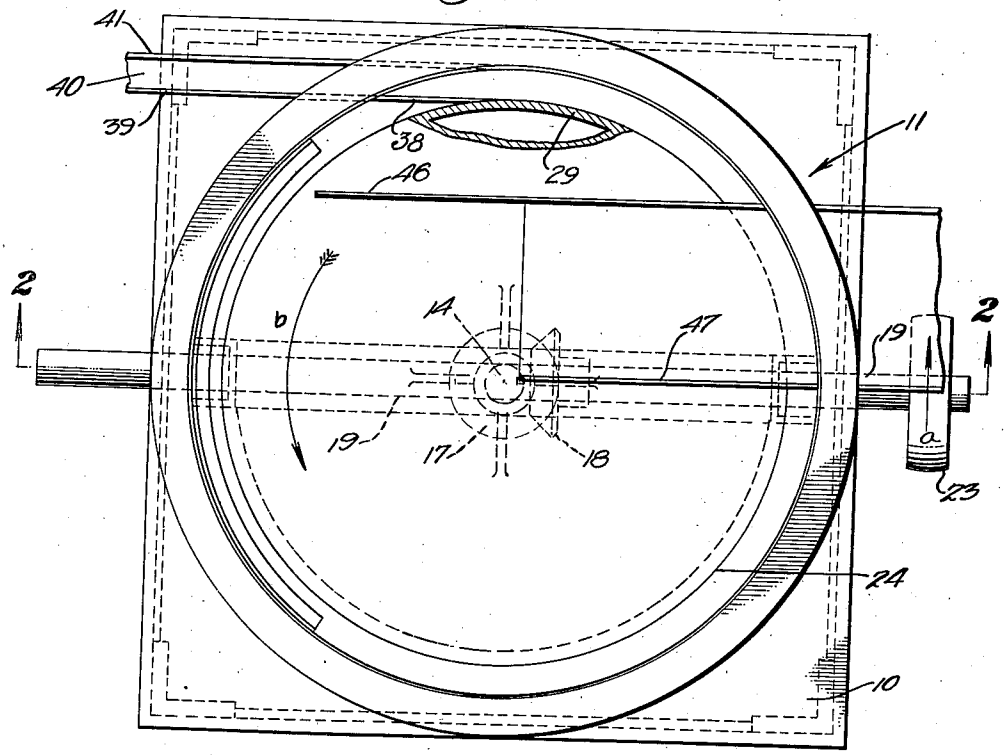
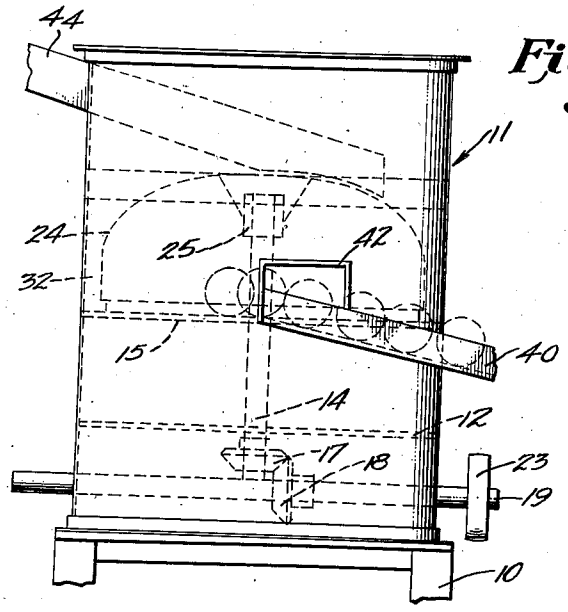


Fig. 3.



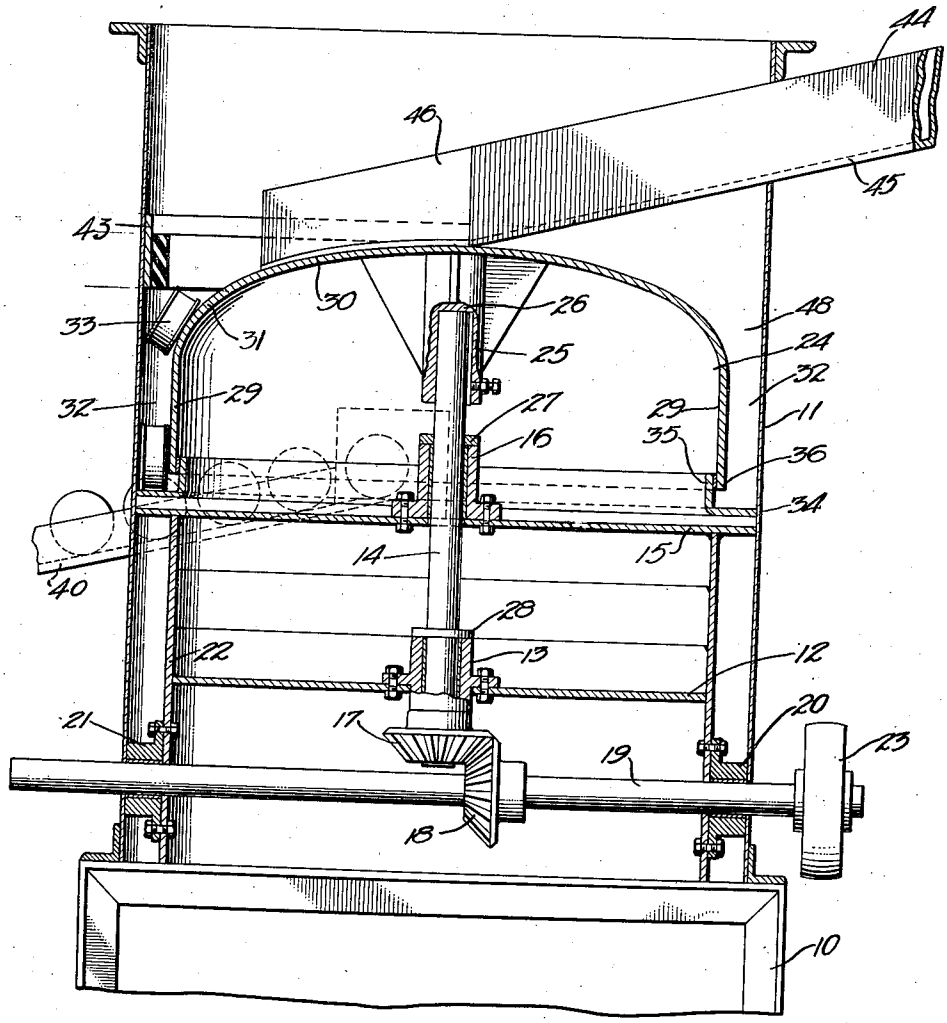
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Fig. 2.



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CAN ALIGNING DEVICE

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3 Claims. (Cl. 198—33)

This invention relates to can machinery and particularly pertains to a can aligning device.

In the handling of cans used to pack various products and particularly cans within which food products are packed it often occurs that the cans are disposed at random within containers such as steam baskets and the like, and that they are not arranged in uniform and systematic position so that they may be passed through other machinery. This is particularly true when cans are delivered in a steam basket to a labeling machine. At the present time it is necessary to employ considerable labor to remove the cans from the basket and to arrange them in cartons, after which they are taken to a labeling machine and placed in the machine in the order in which they are packed in the carton so that the labeling machine may carry them through. In order that a desirable speed of operation may be carried out it has heretofore in most instances been necessary to pack or arrange the cans in a preliminary operation before they are delivered to the operator at the labeling machine, since he works with great speed and skill in picking up the cans and putting them into the machine. It is desirable to provide means for arranging and aligning the cans without manual operation since particularly with round cans it would then be possible to roll the cans along a runway and directly into the labeling machine. It is the principal object of the present invention, therefore, to provide means for receiving cans arranged at random and without any systematic alignment or spacing and to thereafter dispose the cans in alignment on a runway and in a manner to present all of the cans in the same position to a can packing machine, a labeling machine or other apparatus without damage to the cans.

The present invention contemplates the provision of a continuous rotary member upon which the cans are delivered and from which they are moved by centrifugal action to an aligning throat within which they pass and where they are received and fed forwardly to a suitable can runway.

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

Figure 1 is a view in plan showing the structure with which the present invention is concerned.

Fig. 2 is a view in central vertical section showing the structure in detail.

Fig. 3 is a view in side elevation showing the exterior arrangement of the structure.

Referring more particularly to the drawings, 10 indicates a base upon which is mounted a cylindrical housing 11. The cylindrical housing may be open at its upper end or closed if desired. Mounted within the cylindrical housing adjacent the lower end thereof is a horizontal transverse web 12 which carries a central vertical bearing 13. The vertical bearing 13 receives a vertical shaft 14 which extends upwardly through a second web 15 and through a bearing 16 carried thereby. Mounted upon the lower end of the shaft 14 is a gear pinion 17 in mesh with a pinion 18. The pinion 18 is carried by a horizontally extending drive shaft 19 which extends along the diameter of the cylindrical housing 11 and is mounted within bearings 20 and 21. These bearings are carried by an inner cylindrical wall 22. The horizontal shaft 19 projects through the opposite sides of the housing 11 and upon either end may carry a pulley 23 by which the shaft will be driven.

Disposed above the transverse web 15 within the housing 11 is dome shaped aligning drum 24. This drum is fitted with a hub 25 which is formed with a central vertical bore therein to receive the upper end of the shaft 14. The bore is closed at its upper end and rests upon the shaft, as indicated at 26. Suitable bearing collars 27 and 28 are carried by the shaft 14 and rest upon the bearings 16 and 13 respectively. The drum has a vertical cylindrical wall portion 29 and a closed upper convexed head 30 which merges into the vertical wall portion, as indicated at 31, along an arc which is relatively short as compared to the diameter of the drum and the arc of the end member 30. The result will be that while the end face of the drum is relatively flat, cans deposited thereon will frictionally engage the relatively flat portion and will be moved outwardly by centrifugal force as they slide along the end face 30 and then downwardly around the arcuate portion 31 into positions of alignment with the vertical portion 29.

Attention is directed to the fact that the diameter of the cylindrical portion 29 of the drum 24 is materially less than the inside diameter of the housing 11, the difference being such as to provide a throat 32 between the inner cylindrical face of the housing 11 and the outer cylindrical face 29 of the drum, which throat will be sufficiently greater than the height of a can 33 as to insure that the can may slide down edgewise into the throat to a position where its axis will be horizontally disposed and its ends vertically positioned. The bottom of this throat is provided with a floor 34 which is spaced from the upper

face of the transverse housing web 15. This floor member is here shown as being angle-shaped and also having a cylindrical portion 35 which extends upwardly into the portion 29 of the drum to which it may be secured by welding or mechanical fastening means.

Attention is also directed to the fact that the lower edge 36 of the drum wall 29 is spaced vertically a distance above the floor 34 and thus provides an annular groove 37 which extends entirely around and contiguous to the floor 34. As shown particularly in Fig. 1 of the drawings, this groove receives an end finger 38 of side rail 39 of a can runway 40. The opposite side rail of the runway is indicated at 41. The side rail 39 is tangent to the vertical wall of the groove 32 and the finger extends thereinto so that as cans move around the throat 32 they will be engaged by the finger 38 and will be directed outwardly along the runway 40 and through an opening 42 in the side wall of the cylindrical housing 11. This runway, as shown in Fig. 3 of the drawings, extends outwardly and is inclined downwardly so that the cans may roll by gravity to suitable receiving means. The position of the runway 40 with relation to the runway 42 is such as to allow the cans to travel substantially three-quarters of the diameter of the dome 24 before being discharged. This gives the cans sufficient time to assume positions within the groove 32 before being discharged into the runway 40 and tends to insure that the cans will not be violently moved so that they would be dented or become jammed in the machine.

Extending around the inner circumference of the cylindrical housing 11 is an arcuate rubber buffer 43 which is here shown as projecting a partial distance along the circumference although the arcuate length of the structure may be determined by the requirements of the machine. The object of the buffer is to frictionally engage cans which may roll outwardly along the top of the dome in a radial path of travel and cause them to turn and slide into the throat 32 in a tangential path of travel.

Disposed above the dome 24 is a feed runway 44 upon which cans may be deposited at random and without having any systematic arrangement with relation to each other so that they may move down the runway and onto the relatively flat portion 30 of the dome 24. It will be seen that the floor 45 of the runway terminates substantially at the rotary axis of the dome and that a side rail of the runway projects there beyond, as indicated at 46, so that the cans will be fed directly onto the top of the dome and will be carried away from the runway 44 in the direction of rotation of the dome.

In operation of the present invention the machine is assembled as here indicated. It is to be understood that suitable additional bracing may be provided for the housing and the bearings contained therein but that such variation in mechanical construction would not be material to the invention. The drive shaft 19 is driven in the direction of the arrow *a*, as indicated in Fig. 1, and will operate through the gears 18 and 17 to drive the vertical shaft 14 and the drum 24 in the direction of the arrow *b* in Fig. 1. Cans are fed along the runway 44 and will be deposited on the convex top 30 of the drum. Since there is only one side rail 46 which extends beyond the floor of the runway or feed chute and since the direction of rotation of the drum is away from this extending side rail 46 the cans will be carried away from the mouth of the feed chute. Attention is also directed to the fact, as shown in Fig. 1 of the drawings, that the width of the feed chute is such as to cause the side opposite that of the extending rail 46 to be substantially on the center line of the machine with the chute being offset at one side thereof. Due to the fact that the convex upper face 30 of the dome 24 is gradually inclined outwardly the cans which are deposited on it while lying flat will frictionally engage the surface of the dome and will slide outwardly at a speed which will be accelerated by action of the rotating drum. The cans which are deposited on the top of the drum while resting on their circumferential faces will roll radially toward the outer edge of the drum.

Attention is directed to the fact that any violent movement of the cans lying flat or on their circumferences would dent the cans so that they could not be packed. The arc of the convexed end 30 of the drum has, therefore, been carefully laid out so that the convexity will not be so steep as to cause violent movement of the cans in either of their positions, and will at the same time act while frictionally engaging the cans resting upon their circumferential faces to turn the cans onto their ends. The cans which have assumed a flat position with an end resting upon the top of the dome will gradually move outwardly over the convex portion 30 and then downwardly along the arcuate portion 31 and through the throat 48 between the arcuate portion 31 and the lower edge of the buffer 43. The cans which are still resting on their circumferential edges will roll outwardly and engage the face of the buffer 43, thus friction will be set up between one side of the can and the buffer and between the other side of the can and the moving surface of the drum 24 upon which it rests, with the result that the can will be turned edgewise and will slip through the throat 48 and into properly aligned position in the throat 32. The cans will then be resting upon the floor 34 and will be carried forward by the floor as the drum rotates until the finger 38 is encountered. At that time the cans will be stripped from the edge of the drum and will move onto the runway 40 and thence away therealong to a desired position.

From this description it will be evident that the cans will be handled mechanically without any violent action which would cause them to be thrown against each other and damaged or thrown against the sides of the housing and damaged. It will be thus seen that by the construction here disclosed it is possible to provide simple and effective means for rapidly receiving cans at random and for arranging them in a predetermined uniform relation to each other preparatory to being delivered to other apparatus.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes may be made in combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of my 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 cylindrical housing, the axis of which is vertical, a dome member within the housing disposed upon a vertical axis concentric with the axis of the housing and being of a diameter sufficiently less than the housing to form an annular throat around the dome within the housing of a horizontal width slightly greater than the height of a can, said

dome member having a convex top face merging into a downwardly extending cylindrical wall portion disposed substantially parallel to the inner surface of the housing said convex top face representing a spherical segment having a radius greater than that of the cylindrical portion of the dome, a floor carried by the lower edge of said cylindrical wall portion of the dome and being disposed in a horizontal plane across the bottom of the throat between the dome and the housing and upon which cans may rest on their circumferences, means for driving said dome to rotate it around its vertical axis, a runway extending through the side of the housing and communicating with the throat and through which cans may pass from the floor of the dome to be carried away.

2. A can aligning device comprising a cylindrical housing, the axis of which is vertical, a dome member within the housing disposed upon a vertical axis concentric with the axis of the housing and being of a diameter sufficiently less than the housing to form an annular throat around the dome within the housing of a horizontal width slightly greater than the height of a can, said dome member having a convex top face merging into and a downwardly extending cylindrical wall portion disposed substantially parallel to the inner surface of the housing said convex top face representing a spherical segment having a radius greater than that of the cylindrical portion of the dome, a floor carried by the lower edge of said cylindrical wall portion of the dome and being disposed in a horizontal plane across the bottom of the throat between the dome and the housing and upon which cans may rest on their circumferences, means for driving said dome to rotate it around its vertical axis, a runway extending through the side of the housing and communicating with the throat and through which cans may pass from the floor of the dome to be carried away, and a feed chute disposed above the dome and discharging at a point eccentric to the axis of the dome, whereby cans may be delivered onto the dome for subsequent alignment.

3. A can aligning device, comprising a cylindrical housing of uniform diameter disposed with its central axis vertically, a dome member within said housing, a shaft upon the vertical axis of the housing to support the dome member and by which it is rotated, said dome comprising a cylindrical skirt concentric with and spaced from the cylindrical housing, whereby an annular space will occur between said skirt and the housing of a width slightly greater than the height of a cylindrical article to be aligned thereby, the upper portion of said dome being convex and representing a spherical segment having a radius materially greater than that of the cylindrical skirt merging into the wall of the skirt, an annular flange carried at the lower edge of said skirt and extending outwardly toward the circumscribing cylindrical wall of the housing, whereby a horizontal moving support is provided for the articles to be aligned, an article runway extending downwardly and above the dome, said runway having spaced vertical side walls, one edge of said runway being in radial alignment with the axis of the dome and terminating substantially at the axis of the dome, and the other vertical edge of said runway extending parallel to said first mentioned edge and extending beyond said vertical axis to conform to the sloping face of the dome, said dome being rotated in a direction away from the last named edge of the runway, whereby articles moving down the runway and onto the convex face of the dome will be restrained to move in the direction of rotation of the dome, an arcuate buffer of resilient material carried by the cylindrical housing and disposed facing the discharge end of said runway, and an off-take runway communicating with an opening in the housing at the level of the horizontal flange thereof, whereby the cylindrical articles being aligned may move around and on the flange and will be discharged into the runway while resting upon their cylindrical surface.

TOM CHIAPPE.