

[54] ROLLABLE ARTICLE DISPENSER

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[58] Field of Search..... 221/255, 256, 289;
312/71

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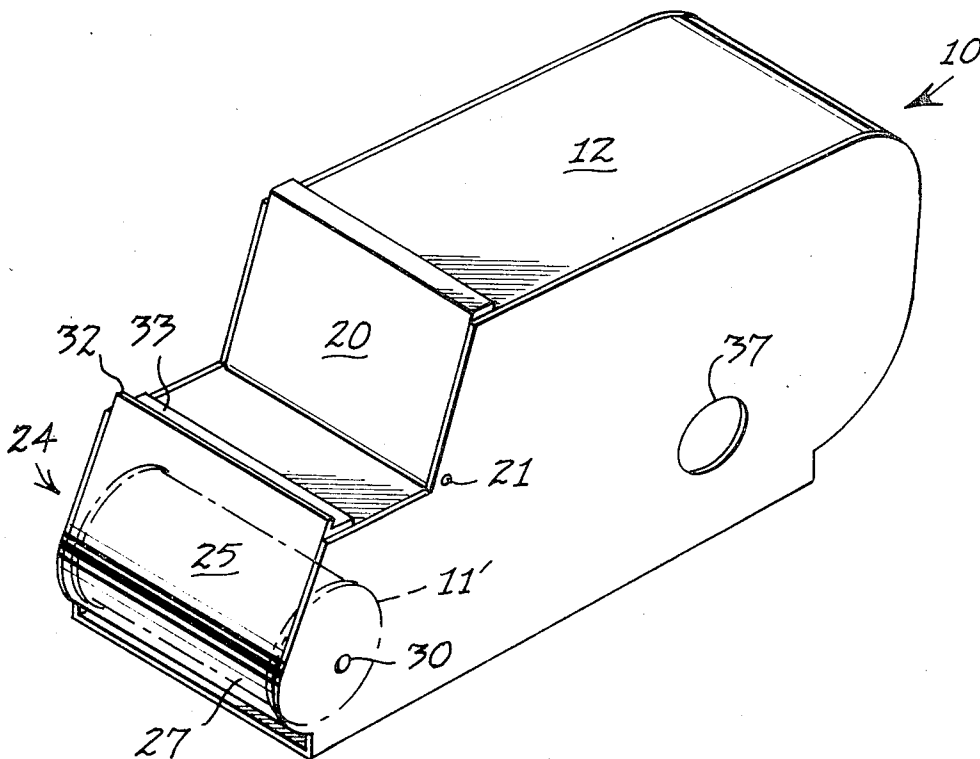
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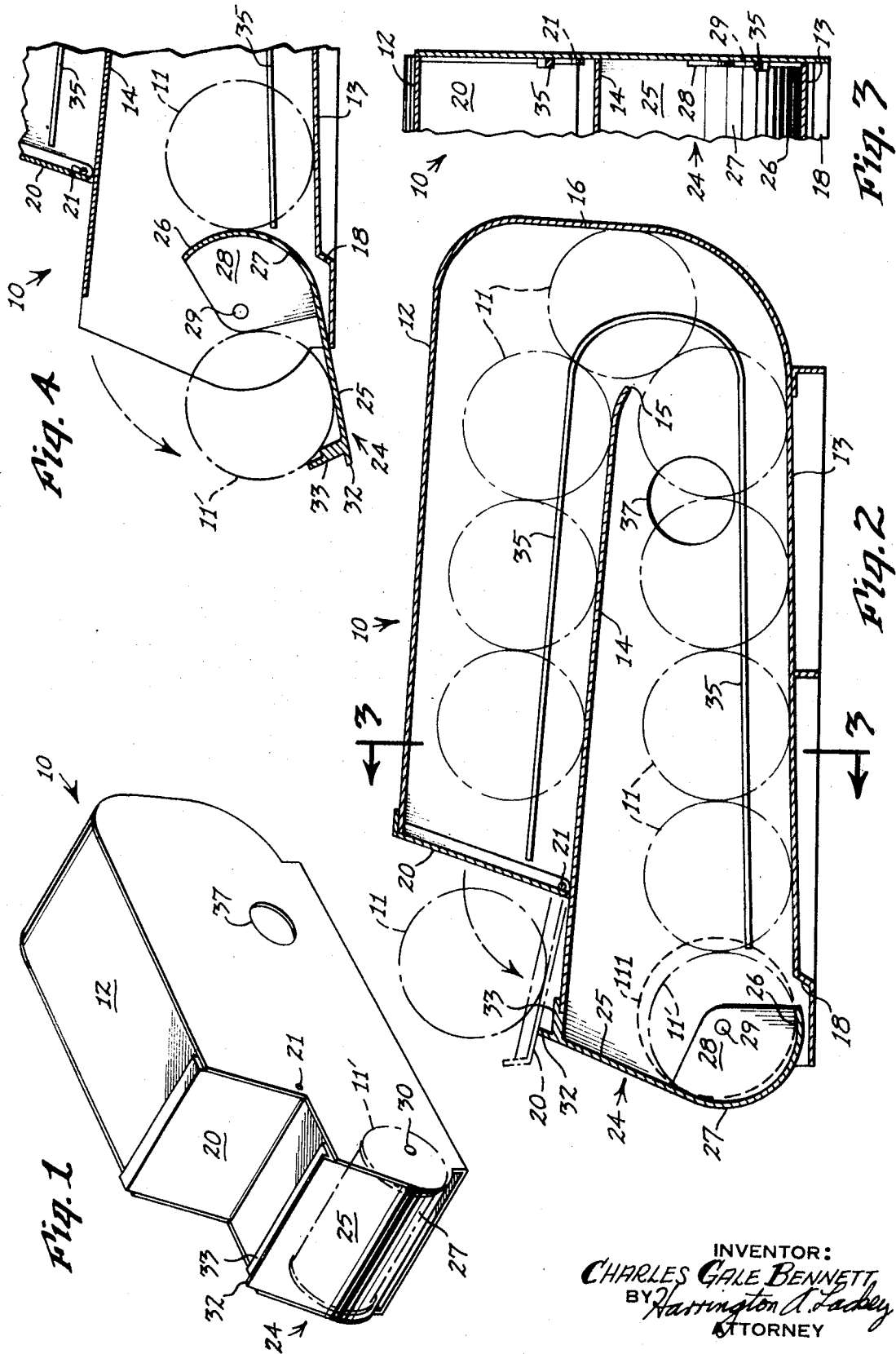
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[57] ABSTRACT

A dispensing device primarily for rollable articles, such as cans or bottles, including an inclined runway for supporting the articles in series for gravitational movement toward a discharge end. A door for opening and closing the discharge end having a front barrier and a bottom barrier merged to form a transversely disposed, arcuate trough. When the door is in closed position, the trough receives the leading article, and when the door is in open position, the bottom barrier member moves between the leading article and the next adjacent article to permit removal of the leading article and to stop movement of the remaining articles on the runway.

6 Claims, 4 Drawing Figures





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ROLLABLE ARTICLE DISPENSER

BACKGROUND OF THE INVENTION

This invention relates to an article dispensing device, and more particularly to a device for dispensing rollable or cylindrical articles.

It is known in the art to store rollable or cylindrical articles, such as bottles and cans in contiguous series upon inclined ramps or runways, to permit the discharge of the lowermost or leading article one at a time by successive actuations of a stop member, such as disclosed in the Nordquist U.S. Pat. No. 2,956,660, issued Oct. 18, 1960.

Also known is a pivotal door having a trough or receptacle within the door for receiving an article within the dispensing device in a closed position and for moving the article exteriorly of the device for removal therefrom when the door is in an open position, as disclosed in the Shanhouse et al. U.S. Pat. No. 2,765,101, issued Oct. 2, 1956.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a dispensing device, particularly for rollable or cylindrical articles, such as cans or bottles, which are arranged in contiguous series for gravitational movement toward a discharge end of a runway. Pivotaly mounted adjacent the discharge end of the runway is a door especially constructed for receiving and discharging one article at a time upon each opening and closing of the door. The structure of the door also functions to block the movement of all of the articles on the runway, except the leading article being discharged, when the door is in open position.

The structure of the dispensing door, made in accordance with this invention, is also preferably designed so that the weight of the article received within the trough of the door biases the door toward closed position, even when pressure is exerted upon the leading article by the trailing articles.

Another object of this invention is to provide a pivotal dispensing door having a bottom barrier member which swings upward into blocking position between the leading and the next succeeding articles when the door is open, with a minimum of displacement of the next succeeding article.

The dispensing device made in accordance with this invention includes a housing, or chute, having an inclined runway for supporting a series of rollable or cylindrical articles adapted to move by gravity toward the lower or discharge end of the chute.

The door closing the chute has a front barrier member and a bottom barrier member joined together, preferably integrally, into an arcuate shape, preferably a cylindrical segment, to form a trough for receiving a single article. When the door is in closed position, the leading article is seated in the trough of the door, while the remaining articles are in contiguous or abutting relationship. When the door is opened, the front barrier member is inclined forward to permit the leading article to roll forward to a position accessible for removal, while the bottom barrier member swings upward between the leading article and the next adjacent article to block the remaining articles with no, or a very minimum, of displacement of the remaining articles. After the leading article is removed, the door is returned to closed position to permit all of the remaining articles to

move forward gravitationally by one space, so that the next adjacent article is received in the trough in position for discharge upon the next opening of the door.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front, top perspective view of a dispensing device made in accordance with this invention;

FIG. 2 is an enlarged sectional elevation of the device disclosed in FIG. 1, with the discharge door in closed position;

FIG. 3 is a fragmentary, sectional elevation taken through the line 3—3 of FIG. 2; and

FIG. 4 is a fragmentary, sectional elevation of the front portion of the device with the discharge door in open position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in more particular detail, the dispensing device 10 for rollable or cylindrical articles, such as cans 11, comprises housing 12 having a lower runway 13 and upper runway 14.

The upper runway 14 is inclined from front to rear and terminates at an edge 15. The edge 15 is spaced from the rear wall 16, a distance greater than the diameter, or greatest transverse dimension, of the can 11, to permit the can to drop from the rear edge 15 of the upper runway 14 upon the upper end portion of the lower runway 13. The lower runway 13 is inclined in the opposite direction from the runway 14, that is, downward toward the front end of the housing 12, where it terminates in a discharge end portion 18.

The housing 12, as well as the runways 13 and 14, may be of solid sheet material, or they may be of open framework, so long as the runways 13 and 14 support the cans 11 in contiguous series for gravitational movement toward the discharge end portion 18.

The upper or front end portion of the runway 14 may be provided with an entrance door 20 pivoted by hinge 21 to swing between a closed position disclosed in solid lines in FIGS. 1 and 2, and an open position disclosed in phantom in FIG. 2.

Mounted adjacent the discharge end portion 18 of the lower runway 13 is a discharge door 24 having a front barrier member 25 and a bottom barrier member 26. The front barrier member 25 extends from the top of the lower chute, formed by the forward extension of the runway 14, downward as a planar wall. The lower end portion of the front barrier member 25 forms a trough 27 having a cylindrical segment shape, which is also a part of the barrier member 26. Preferably, the radius of the cylindrical trough 27 is approximately equal to, or less than, the radius of the cylindrical or rollable article, such as the can 11. Thus, the leading can 11' may seat or fit snugly within the cylindrical trough segment 27 when the door 24 is in its closed position, as best disclosed in FIG. 2.

The cross-section of the discharge door 24 is uniform throughout its width across the housing 12. Formed at each end of the door 24 are a pair of side walls or gussets 28 which are provided with pintles or hinge pins 29 journaled in recesses or holes 30 in the side walls of the housing 12 to permit the door 24 to swing between closed and open positions.

When the door 24 is in its closed position as illustrated in FIGS. 1 and 2, the bottom barrier member 26 is in substantial alignment with the lower runway 13, so

that the leading can 11' will roll freely along the runway 13 until it comes to rest seated within the arcuate trough 27. Any other cans 11 upon the lower runway 13 or upper runway 14 will continue to roll until they abut against the next lower can 11, and ultimately against the leading can 11', which is stopped by the front barrier member 25 of the door 24 in closed position.

When the door 24 is opened, as disclosed in FIG. 4, the leading can 11' will roll forward along the front barrier member 25, which is now declined forward. In open position, the door 24 makes the leading can 11' available for removal from the dispensing device 10.

Also, when the door 24 is in its open position as disclosed in FIG. 4, the bottom barrier member 26 is swung upward about the hinge pins 29 as a rotary axis to move between the leading can 11' and the next succeeding can 11. Thus, the bottom barrier member 26 stops any forward progress of the next succeeding can 11, while the leading can 11' is being removed.

When the door 24 is again returned to its closed position, after the leading can 11' has been removed, then the next succeeding can 11 rolls forward, over the now depressed bottom barrier member 26 until it is seated in the arcuate trough 27, in the same manner as the original leading can 11'. Thus, the next succeeding can 11 becomes the leading can. Accordingly, each successive can 11 advances a distance equal to its diameter along the runways 13 and 14.

Although the trough 27 may receive rollable or cylindrical objects whose greatest or rolling radius may be greater than the radius of the cylindrical-segment trough 27, such as the can 111, nevertheless it is preferable that rollable articles of smaller radius than the radius of trough 27 not be dispensed, if possible. The reason for this is that the center of gravity of a cylindrical can 11' coincides with the rotary axis of the hinge pins 29. Also, the center of gravity of a cylindrical can 111 is to the right of the rotary axis of the hinge pin 29. Thus, when the can 11' is seated in the trough 27, the can 11' creates no turning moment, tending to open the door 24, about the rotary axis 29. Although, as disclosed in FIG. 2, the mass of the door 24, per se, may produce a slight turning moment which would tend to open the door 24, nevertheless this mass is quite negligible, and actually would be neutralized by the friction between the hinge pins 29 and their corresponding journal holes 30, as well as the frictional engagement between the gussets 28 and the adjacent side walls of the housing 12.

Where a larger can 111 is dispensed from the device 10, the center of gravity of the larger can 111 will actually create a counter-balancing moment about the rotary axis of the pin 29, tending to close the door 24.

Also, where the central axis of the cans 11' coincide with the rotary axes of the pins 29, then any moments about the rotary axis 29 created by the pressure of the following or succeeding cans 11 will be minimal to non-existent.

If desired, the top edge or lip of the front barrier member 25 may project upward above the upper runway 14 to provide a handle 32. Furthermore, a projection 33 may extend rearwardly from the front barrier member 25 to provide a retaining barrier for the leading can 11' when the door 24 is in its open position, as disclosed in FIG. 4.

Also, the handle lip 32 provides a stop for the entrance door 20 so that when the entrance door 20 is open, it will decline rearward, as disclosed in phantom in FIG. 2.

The interior faces of the side walls of the housing 12 may also be provided with bumper rails 35 to minimize contact between the ends of the cans 11 with the side walls, and thereby reduce the drag against the ends of the cans as they move down the respective runways 13 and 14.

Where the housing 12 is made of solid sheet material, an inspection hole 37 may be formed in one or both side walls to indicate to the observer when the dispensing device 10 should be filled.

By having a trough 27 which is a pure cylindrical segment having a radius equal to the radius of each can 11 and 11', there will be practically no displacement of the next succeeding can 11 as the door 24 is moved from closed to open position. For example, where the trough segment 27 is not purely cylindrical, or where the pivotal axis is in a different location than the hinge pins 29, it is conceivable that the next succeeding can 11 would be either thrust rearward or permitted to move forward as the barrier member 26 is raised, and the reverse movement would be effected when the barrier member 26 is lowered. Such displacement of the can 11, when multiplied by the pressure exerted by the succeeding cans 11 in the series could produce an unnecessary effort on the part of the operator in opening and closing the door 24.

What is claimed is:

1. A rollable article dispensing device comprising:

- a. an elongated runway adapted to support a plurality of rollable articles in series for movement forward along said runway,
- b. said runway having a discharge front end portion,
- c. a door comprising a front barrier member and a bottom barrier member joining said front barrier member to form an arcuate trough for receiving one of said articles,
- d. said trough constituting substantially the segment of a cylinder having a cylindrical axis extending transversely of said runway,
- e. means mounting said door adjacent said discharge end portion to pivot about an axis substantially coinciding with said cylindrical axis, between a closed position in which said bottom barrier member is in substantial alignment with said runway for receiving an article in said trough and said front barrier member is substantially upright to block forward movement of said article, and an open position in which said front barrier member is disposed forward of its closed position to render said article accessible for removal from said trough and said bottom barrier is in a substantially upright position to block forward movement of any other articles from said discharge end portion.

2. The invention according to claim 1 in which the radius of said trough is not substantially greater than the rolling radius of each of said articles.

3. The invention according to claim 1 in which the center of gravity of an article received in said trough in said closed position is not in front of said pivotal axis.

4. The invention according to claim 1 in which said front barrier member is inclined down and forward in said open position.

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5. The invention according to claim 4 further comprising a lip on the top extremity of said front barrier member, said lip projecting up in said open position to retain an article on said front barrier member.

6. The invention according to claim 1 in which said 5

runway is inclined down toward said discharge end portion at an angle great enough to effect gravitational movement of said articles forward toward said discharge end portion.

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