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W. E. PALMER
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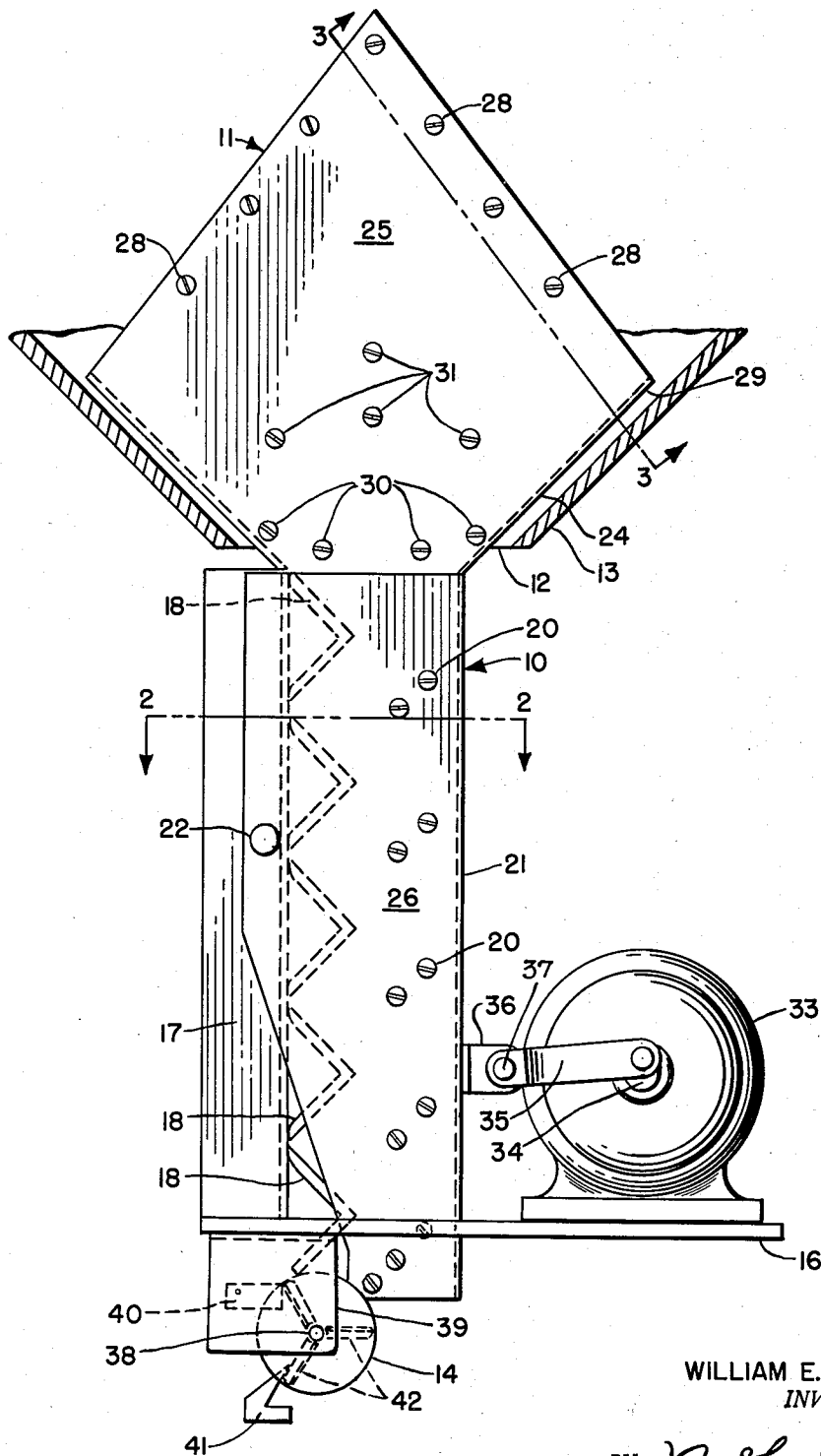


FIG. 1

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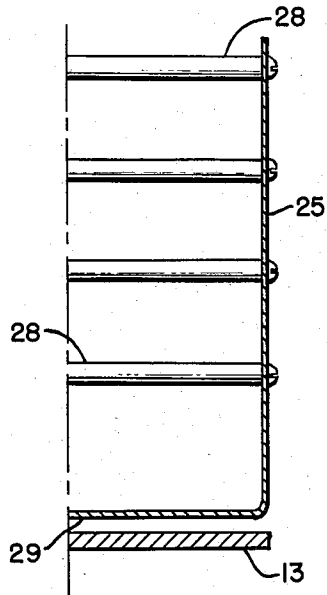


FIG. 3

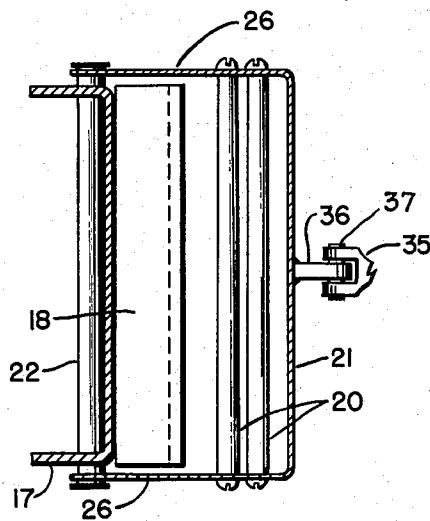


FIG. 2

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3 Claims. (Cl. 221-178)

The present invention relates to a device for removing generally cylindrical articles from a hopper or the like, and serially discharging them in a predetermined alignment.

While it will be apparent that the invention will be used for many purposes, it will be described in connection with the handling of frankfurters preparatory to packaging. The development of automatic packaging machinery and the like necessitates structure for delivering the frankfurter to the packaging machinery in a given alignment so that they then can be stacked or placed neatly in the package. In many instances this is a hand operation because the shape of the articles, coupled with the fact that they may all be jumbled together like a log jam in a river, which necessitates the exercise of mental judgment to straighten them out into a pattern.

Since the whole object of using automatic packaging machinery is to reduce costs by reducing or eliminating expensive hand operations, the ultimate goal is not achieved when other hand operations are required to put the automatic machinery into operation. Thus the principal object of the present invention is to provide an apparatus that will remove frankfurters or the like from a bin in which they have been temporarily held and deliver them one at a time upon demand in a predetermined orientation. The delivery may be either to a conveyor structure upon which they are transported without misalignment to the packaging machine, or directly into the packaging machine itself.

Another object of the invention is to provide a magazine which will not jam even when handling units in which substantial irregularities in size and shape occur.

Further objects and advantages include a device that is sturdy yet simple, making the capital investment required quite nominal; a device that requires little or no maintenance; a device that with little effort may be thoroughly cleaned to meet the necessary sanitary requirements; and a device that requires substantially no human supervision.

Other objects and advantages will become apparent from the following description taken in conjunction with the drawings in which:

Figure 1 is an elevation, partially in section, of an embodiment of the invention.

Figure 2 is a section taken at line 2-2 of Figure 1, and

Figure 3 is a view taken at line 3-3 of Figure 1.

The illustrated embodiment includes a magazine, generally 10, having an alignment head, generally 11, projecting upwardly therefrom through an opening 12 in the bottom of a hopper 13. At the bottom of the magazine is a wheel 14 to release the frankfurters one by one from the bottom of the magazine 10.

The magazine 10 includes a frame 16 which has projecting upwardly therefrom a stationary member 17. A plurality of angle irons 18 are attached to and form a part of stationary member 17 to define one side of a zig-zag passage through the magazine 10. It will be

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noted that the plurality of angle irons give member 17 a wall having a generally corrugated configuration. The width of the passage, as measured along the length of each of angle irons 18, is greater than the length of the cylindrical objects to be handled, the frankfurters in the instant case.

The other side of the zig-zag passage is defined by a plurality of transverse rods 20, secured to a channel-shaped movable member 21. Rods 20 are spaced from angles 18 a distance slightly greater than the thickness of the frankfurters.

Movable member 21 is pivotally attached to stationary member 17 by a shaft 22.

The alignment head 11 comprises a funnel-shaped sheet metal body 24, having two of its sides 25 extending vertically parallel to each other. Body 24 is secured to the upper end of magazine 10 with the vertical plates 25 forming an extension of the plates 26 of channel 21.

Along the upper edges of sides 25 are a plurality of spaced rods 28, positioned in an inverted V pattern, with a distance between the rods slightly greater than the thickness of the frankfurters. Preferably the lowermost rods 28 are spaced from the slanting ends 29 of body 24 a distance somewhat greater than the distance between the remainder of rods 28. Adjacent the bottom opening of body 24, and the top of magazine 10 are a plurality of transverse rods 30 to narrow down this opening so that the frankfurters may drop into the magazine one at a time and then only when the frankfurter is in alignment with the zig-zag passage through the magazine. Immediately above rods 30 are a group of rods 31, arranged in the form of a pair of triangles. The distances between rods 31 and between rods 31 and rods 30 are sufficient to permit the passage of the frankfurters.

A small movement and vibration of member 21 and alignment head 11 is produced by a power means including an electric motor 33 mounted on frame 16. Attached to the shaft of motor 33 is a small crank 34. A connecting rod 35 is secured to a bracket 36 on movable member 21 by means of a pin 37 and also to crank 34. In the illustrated embodiment bracket 36 is moved only 1/16 of an inch.

Wheel 14 is mounted on an axle 38, journaled in arms 39, attached to frame 16. Various means will be apparent to those skilled in the art to produce rotation of the wheel when it is desired to discharge a frankfurter, and to prevent rotation of the wheel at other times. The exact form of the means will be primarily dependent upon the structure into which the frankfurters from the magazine 10 are to be discharged. A block 40, pivotally secured to arms 39, will be used to prevent rotation of the wheel 14 in other than a clockwise direction, with the block being tipped out of the way when the wheel is to rotate. A latch, 41, may be used to prevent rotation of the wheel in a clockwise direction by its engagement with one of the vanes, 42, of wheel 14. When it is desired to discharge a frankfurter, latch 41 may be moved aside, whereupon the weight of the frankfurters on vane 42 will rotate wheel 14 in a clockwise direction. At the same time, block 39 is pivoted to permit the succeeding vane 42 to pass into the position illustrated in Figure 1.

In accordance with the requirements of 35 U. S. Code (1952) 112, a preferred embodiment of the invention has been illustrated and described. However, various modifications will be apparent to those skilled in the art and the description of the invention should not be construed as imposing unnecessary limitations on the appended claims. For example, the left hand side of the zig-zag passage has been described as being formed of angles. These are preferred over other types of construction such as bent sheet metal because of the added

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rigidity. Similarly, angle irons, bent sheet metal, or the like, might be used for the opposite side of the zig-zag passage in place of rods 20. However, it has been found that the rods offer the advantage of strength without a large mass or large areas which induce complications because of the vibration of the member 21.

When hopper 13 is filled with frankfurters, the frankfurters will lie at all angles and tend to jam up in the same manner as the logs in a log jam in a river. The vibration of the alignment head provides sufficient agitation of the frankfurters that they will work themselves around into alignment with the openings between the rods 28. In some instances the frankfurters will pass through rods 28 with one end first, but in such case, they will butt against rods 31 or rods 30 and the vibration will continue to work them around until they are substantially parallel with the various rods. They will then work down adjacent the lower rods 30 and will pass into the upper end of the magazine 10.

With a straight passageway in the magazine it was found that the frankfurters would tend to tip up on end, whereupon they would jam up causing a block in the passage. However, the tumbling action of the frankfurters as they move from side to side in the zig-zag passageway keeps the frankfurters in the desired alignment, whereupon they move smoothly through the passage without any jamming. In addition, the vibration accompanied by the rapid movement of one side of the passage toward and away from the other side of the passage further assists in the prevention of any jamming of the frankfurters in the magazine. It is well known that the tolerances are quite large in the variation in size of the frankfurters. Furthermore, some of them tend to curl into a semi-arc. These irregularities greatly increase the tendency of the frankfurters to jam up in the magazine but the structure I have devised overcomes these difficulties.

I claim:

1. A magazine for generally cylindrical objects, said magazine having a fixed member, a second member pivotally mounted with respect to said fixed member, said

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members being positioned side by side and each of such a configuration as to form one side of a zig-zag passage for said objects, and power means connected to said second member to repeatedly pivot said second member in short arcs between a position at which said passage is only slightly greater in width than the diameter of said objects and a position at which said passage is of a greater width.

2. A magazine for frankfurts or the like, said magazine including a fixed member having wall of corrugated configuration, said corrugations being generally horizontal, a second member pivotally mounted with respect to said first member, a plurality of generally horizontal rods attached to said second member and positioned in juxtaposition with respect to said wall to define a zig-zag passage for said frankfurts, rotary power means having a crank, and a connecting rod between said crank and said second member.

3. A device for discharging a plurality of generally cylindrical shaped objects through an opening in the bottom of a hopper in a predetermined alignment, said device including a pair of spaced plates positioned within said hopper above and adjacent said opening and in alignment therewith, the distance between said plates being greater than the length of said objects, a plurality of generally parallel cross bars between said plates and attached thereto, said bars being spaced from each other a distance greater than the thickness of said objects, a number of said bars forming an inverted generally V shaped grating above said opening, other of said bars being positioned within said V, and power means to vibrate said grating and plates.

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