Sept. 3, 1957 T. N. CUMMINGS ET AL 2,805,095

APPARATUS FOR HANDLING CARTONS

Original Filed Sept. 10, 1953 3 Sheets-Sheet 1

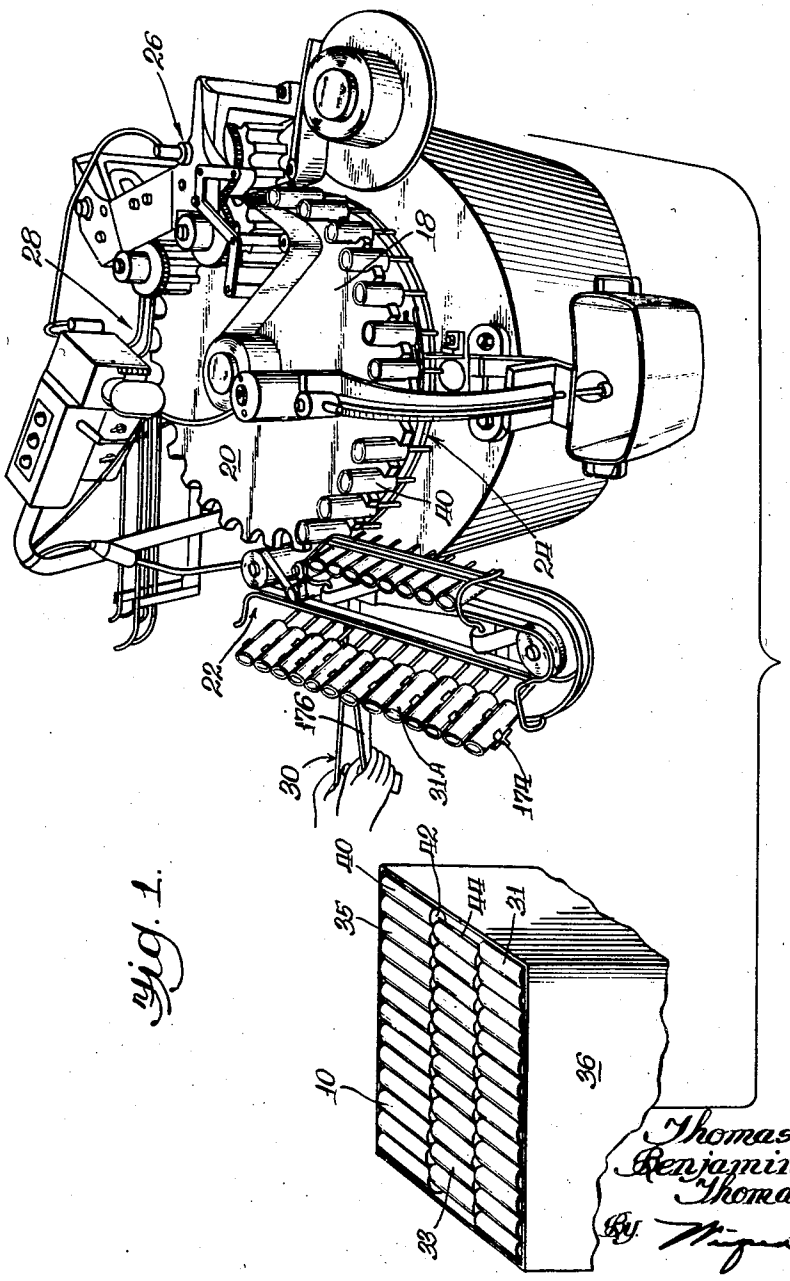

Fig. 1.

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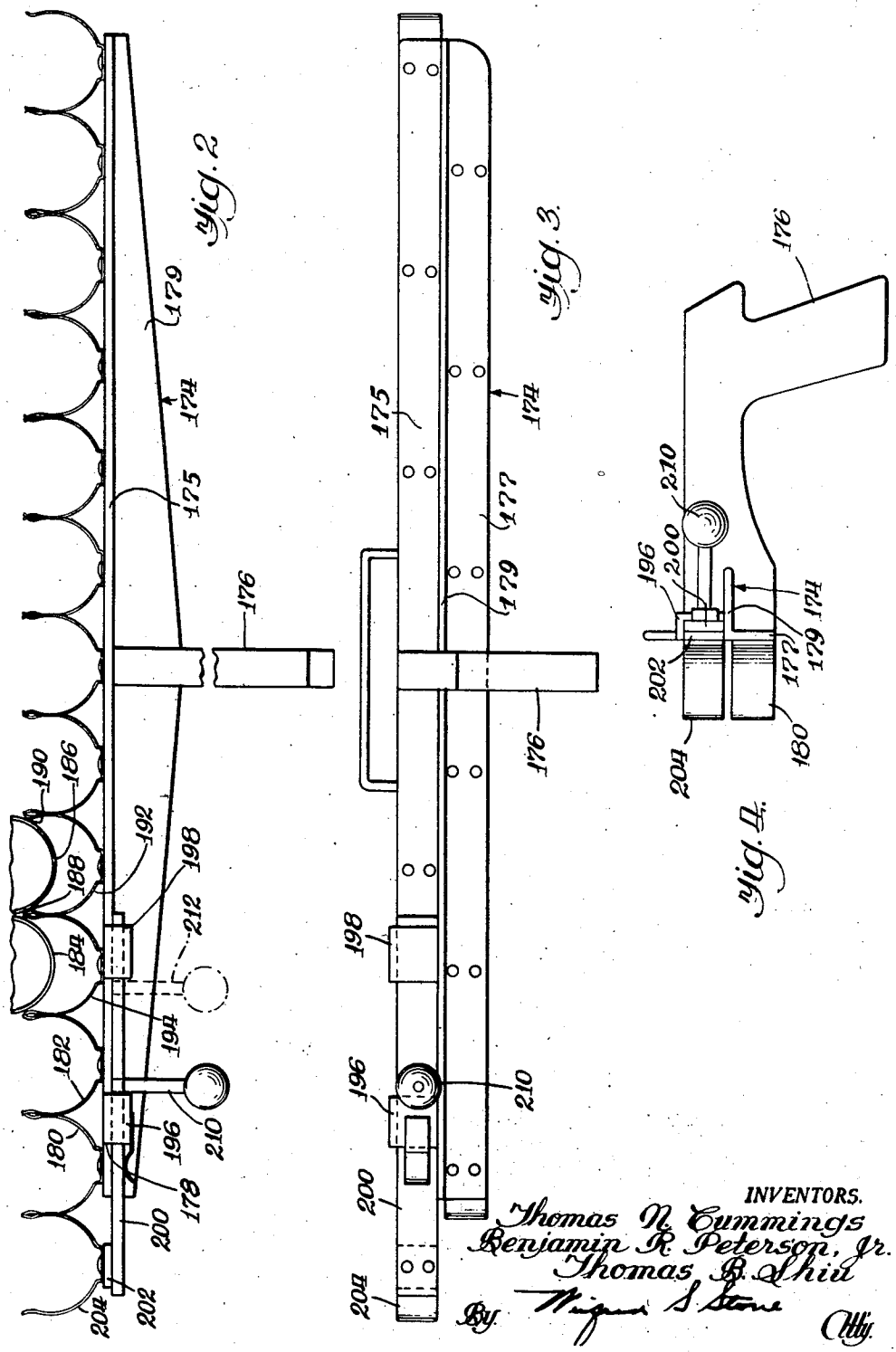

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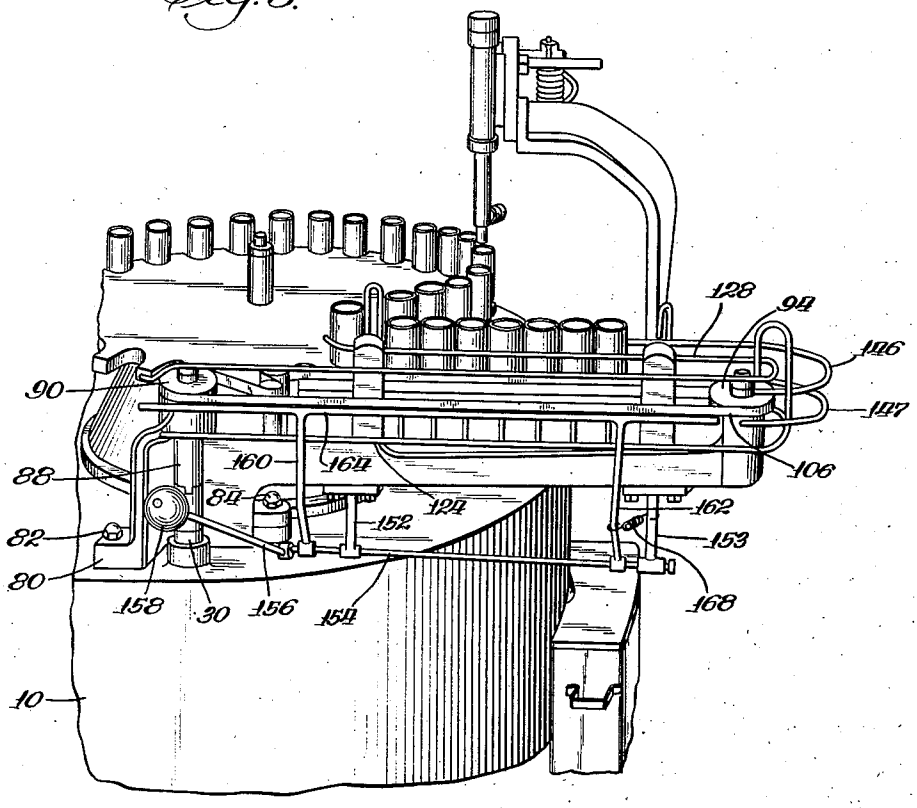
Fig. 5.



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APPARATUS FOR HANDLING CARTONS

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Original application September 10, 1953, Serial No. 379,332. Divided and this application December 14, 1954, Serial No. 475,262

5 Claims. (Cl. 294—99)

This invention relates to a method of transferring empty erected cartons from a shipping container to filling equipment. It also relates to a transfer gun alone and in combination with a loading station on the filling equipment. The application is a division of copending application Serial No. 379,332, filed September 10, 1953.

The general object of this invention is to relate the loading of an erected container filling machine to the form in which erected containers are received from the carton manufacturer. In explanation, this invention is not concerned with the packaging of ice cream, comestibles or other products in cartons which at the time of packaging are in flat form. It relates to filling containers which at the time of packaging are in erected form. In the ice cream business, these include ice cream cones, pushups, Dixie cups, and cylindrical pint and quart containers. These containers are usually not made by the ice cream manufacturers but are received in erected form. They arrive at the ice cream packer's plant in large shipping containers. If the containers are conical such as cones or Dixie cups, they are nested and they can be dispensed one at a time from the bottom of a stack into the filling machine. If, on the other hand, their cross section is constant as in the case of pushups or cylindrical pint and quart containers, the shipping containers received from the carton manufacturer are side by side. Each container can be individually picked up.

Herein lies one problem which applicants seek to overcome—they are individually picked up. This is slow. A feature of applicants' invention is the provision of a device for picking up an entire row of such non-nestable containers as they lie in the shipping container received from the carton manufacturer, and the provision of a loading station on the ice cream filling machine which will receive a complete row of such containers. The ice cream apparatus disclosed relates principally to pushups and discloses a gun which picks up twelve or thirteen pushups from the shipping container of pushups so that the entire row may be loaded in the filling machine by a simple manual operation. In this connection, applicants provide an assemblage for loading the containers onto a central or loading table which makes possible the steady feeding of the pushups onto the table although the containers are inserted into the loading mechanism at irregular intervals of time.

The man skilled in the art will readily understand the present invention and its ramifications more thoroughly from a further reading of this disclosure, particularly when viewed in the light of the drawings, in which:

Figure 1 is an isometric view of a carton filled with containers and an apparatus for filling the containers;

Figure 2 is a plan view of the device for picking up containers illustrated at the left of Figure 1;

Figure 3 is a rear elevational view of the pickup device illustrated in Figure 2;

Figure 4 is an end elevational view of the same pickup device; and,

Figure 5 is a front perspective view of the feeding mechanism.

Figure 1 illustrates a plurality of containers 10 disposed in rows 31, 33 and 35 within a carton 36. The containers 10 are to be filled by a filling machine 18, also illustrated in Figure 1. The container filling machine 18 illustrated is particularly adapted to fill the containers 10 with ice cream, although it will be understood that the present invention may be practiced equally well with a machine for filling cartons with other materials.

The carton-filling machine 18 has a loading table 20 which is rotatable relative to four operating stations, namely: a container-loading station or assemblage 22, an ice cream loading station or assemblage 24, a wrapping station or assemblage 26, and an unloading station or assemblage 28. Figure 1 illustrates the carton pickup device, designated 30, which may also be called the loading gun, placing a row of containers, designated 31A, on the container-loading station or assemblage 22 of the carton-loading device 18.

From the point of view of the ice cream industry, the present invention is particularly applicable to pushups and cylindrical ice cream containers, and these are the common erected, non-nested containers used today in large quantities in the ice cream industry. Containers for pushups are constructed with a cardboard cylinder 40 having a bottom 42 at one end, and a stick 44 attached to the bottom of the cylinder 40, as illustrated in Figure 1. The stick 44 and bottom are axially slidable in the cylinder 40, and the contents of the cylinder 40 may be pushed out by means of the stick 44.

The pushups are received in a large box, and they lie in horizontal aligned rows such as illustrated in Figure 1. The rows contain alternatively twelve pushups and thirteen pushups, in Figure 1 row 33 having 12 pushups and rows 31 and 35 thirteen pushups. The inventors provide a loading gun which is pushed downwardly onto the top row and picks up twelve (or thirteen) containers with one press. The operator then turns, as shown in Figure 1, and inserts the entire twelve into the loading station, and returns to the box 36 for the next row. If the preceding row contained twelve pushups, the next lower row will contain thirteen, and a loading gun has a device for picking up the thirteenth pushup in alignment with the other twelve. In ice cream filling, it is important that operation continue at a constant speed and without interruption because the temperature which controls the viscosity of the ice cream mix is adjusted for continuous flow. Upon resumption of operation after a short stop, it is necessary to extrude ice cream from the nozzle for a few moments to refill the pipes with ice cream of the correct consistency.

The pickup device, or loading gun, is shown in Figs. 2, 3 and 4. It consists of a T-channel 174 with a gun-type handle 176 mounted on the web side of the channel. The upper flange of the T-channel 174 bears the numeral 175, the lower flange, 177, and the web, 179, see Figures 3 and 4. Mounted in two rows along the outer surface of the channel 174 are U-shaped clips such as 180 and 182. There are six clips in each row and they are staggered. The clips are made of spring steel with their ends flared outwardly, the ends being spaced from each other by slightly less than the diameter of a pushup. Referring to Figure 2, two pushups 184 and 186 are shown as they lie in the container 36 of Figure 1. The two ends 188 and 190 of the clip 192 can be pushed between the pushups 184 and 186. The clip 192 clasps the pushup 186 and the clip 194 clasps the pushup 184. Where containers are packed in a box with the axes of each row lying in a single plane, the gun thus far described is all that is needed.

However, as explained above, pushups are not so packed. In one row, there will be thirteen, and in the adjacent next row in the horizontal plane and vertical plane twelve, with the sticks of the containers of one row lying between the containers in the adjacent row in the horizontal plane, which makes it necessary that the gun be able to pick up either twelve or thirteen containers at one time. To effect this, the inventors have mounted on the upper flange **177** of the web side of the T-channel **174**, two brackets **196** and **198** which form, referring to Figure 4, a rectangular guideway in which slides a flat bar **200**. The upper flange **177** of the T-channel **178** is cut away back to the bracket **196**. The outer surface of the bar **200** carries a stop plate **202** upon which is mounted a clip **204**. The outermost clip on the upper flange **177** of the T-channel **178** is **182**, while the outermost clip on the lower flange **175** of the T-channel **178** is **180**. The bar **200** carries a finger arm **210** which, when it abuts the inner edge of the bracket **196**, holds the clip **204** in proper relationship to the next clip **180**. By moving the bar **200** to the right by means of the finger **210**, the stop **202** will engage the bracket **196** and hold the clip **204** in vertical alignment with the clip **180**. When the operator is about to pick up a row of twelve pushups, he retracts the finger arm to the dotted position **212**, which brings thte clips **204** and **180** into vertical alignment as viewed in Figure 2, and presses the clips into the row. This means that the left-hand pushup is clasped by two clips. When the operator wishes to pick up thirteen pushups, he moves the finger **210** to the left into the solid-line position.

Referring to Figure 1, after the operator has picked up a row **31**, **33** or **35** of pickups, he seats the row of pushups on the container-loading station **22**, and pulls away the loading gun **176**. All of the pushups are released at one time into the loading station where the belt promptly picks them up and quickly carries them around until they engage the last preceding pushup moving toward the loading table.

While the U-shaped brackets have been illustrated above as flexible, it is possible to construct the pickup device **30** with rigid U-shaped brackets similar to the fixed wall notches in the table **20** in Figure 1. In this construction, the spacing of the arms of the U-shaped brackets is slightly less than the diameter of the containers **10** to be retained therein, so that purchase is obtained by slightly deforming the container **10**.

Applicants' method turns upon picking up a row at a time and being able to release the row at one time. Picking up the containers from their sides is just one way of picking up a row. The carton **36** may be opened from that side toward which the open end of the pushups are directed and a gun equipped with a row of outwardly expanding clips for holding the containers from the inside could be used. From the standpoint of rapid loading, this would be effective. It was rejected as not being as sanitary as grasping the containers from the outside.

It is evident that the loading station on the filling machine must be capable of receiving a row at a time. For the purposes of this invention, however, a detailed description of the feeding mechanism or feeding station shown in Figure 5 is unnecessary. Only the receiving station of the mechanism is important.

Referring to Figure 5, the base of the machine **10** provides a source of power to rotate a stub shaft **30**, which is removably coupled to a shaft **88** journaled on a casting **80** held to the base machine **10** by bolts **82** and **84**. Mounted on the casting **80** is an upwardly open container guideway, and the straight portion in front constitutes the receiving station of the feeding mechanism. This guideway is formed by rails. The bottom rail is designated by the numeral **124** while the outer walls consist of the two rails **146** and **147** and the inner wall of an upper rail **128** and a flat surfaced belt **106** entrained over pulleys **90** and **94**.

Mounted on arms **152** and **153** depending from the casting **80** is a shaft **154** upon the outer end of which is mounted an arm **156** with knob **158**. Also keyed to the shaft **154** are arms **160** and **162**, the upper ends of which carry a rail **164**. This rail constitutes a removable side wall for the receiving station. A spring **168** between the arms **162** and **153** urges the rail **164** into the position shown in Figure 5 where it forms an extension of the rail **147**.

In use, the operator presses down the arm **156**, which swings the rail **164** outwardly and downwardly as illustrated in Figure 1. The operator then moves the gun loaded with pushups laterally into the receiving station, the sticks of the pushups depending below the rail **124**. The operator next raises the arm **156** and the rail **164** engages the outer sides of the pushups. He then pulls the gun away, each clip releasing its pushup. The rail **164** presses the pushups against the belt moving from left to right and they promptly move around to the position shown in Figures 1 and 5.

Having thus described our invention, what we claim is:

1. A container loading gun comprising an elongated bar, a plurality of U-shaped arms extending outwardly mounted in a row on one side of said bar with the axes through the U parallel, their axes lying in a single plane and being spaced by approximately twice their width, and a second row of similar arms similarly spaced but with their axes at the midpoint between and parallel to the axes of the first pairs of arms, mounted on the same side of the bar and in a row adjacent to the first.

2. A device for picking up a plurality of containers with a single motion comprising an elongated frame provided with a channel parallel to its axis of elongation and a plurality of members extending outwardly from the same side of the elongated frame and being equally spaced along the axis of elongation of the frame, a slide translatably disposed within the channel, said slide being provided with a member extending outwardly therefrom, whereby the slide may be positioned to add one member to the line of members on the frame for holding containers.

3. A device for picking up a plurality of containers with a single motion comprising a frame having an elongated plate, a plurality of U-shaped clips of equal size mounted to the surface of thte plate in two parallel rows and extending outwardly therefrom with their axes parallel, the clips in each row being spaced by a distance equal to the greatest distance across the U-shaped clips and the clips in the two rows being staggered, the axes of all clips lying in a single plane and a handle attached to the surface of the plate opposite to the clips and extending outwardly therefrom.

4. A device for picking up a plurality of containers with a single motion comprising the elements of claim 3 wherein the clips are constructed of resilient material.

5. A device for picking up a plurality of containers with a single motion comprising a frame having an elongated plate provided with an elongated recess at one end parallel to the axis of elongation of the plate, a plurality of U-shaped clips of equal size mounted to the surface of the plate with their axes parallel to the axis of elongation of the plate and extending outwardly therefrom, adjacent U-shaped clips terminating on a common plane normal to the axis of elongation of the plate, a slide, means to translatably mount the slide to the frame adjacent to the recess, and a U-shaped clip mounted to the slide parallel to the axis of elongation of the plate and extending outwardly from the slide.

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