

April 8, 1958

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2,829,918

GRIPPING DEVICES FOR HANDLING BOTTLES

Filed Sept. 20, 1955

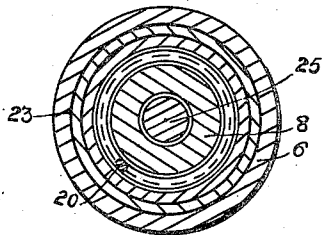
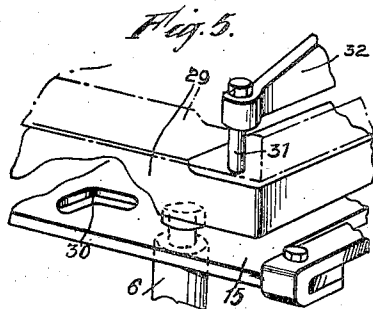


Fig. 2.

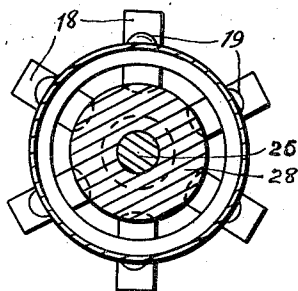
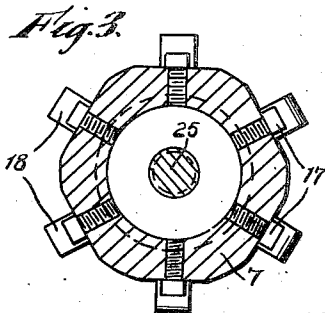
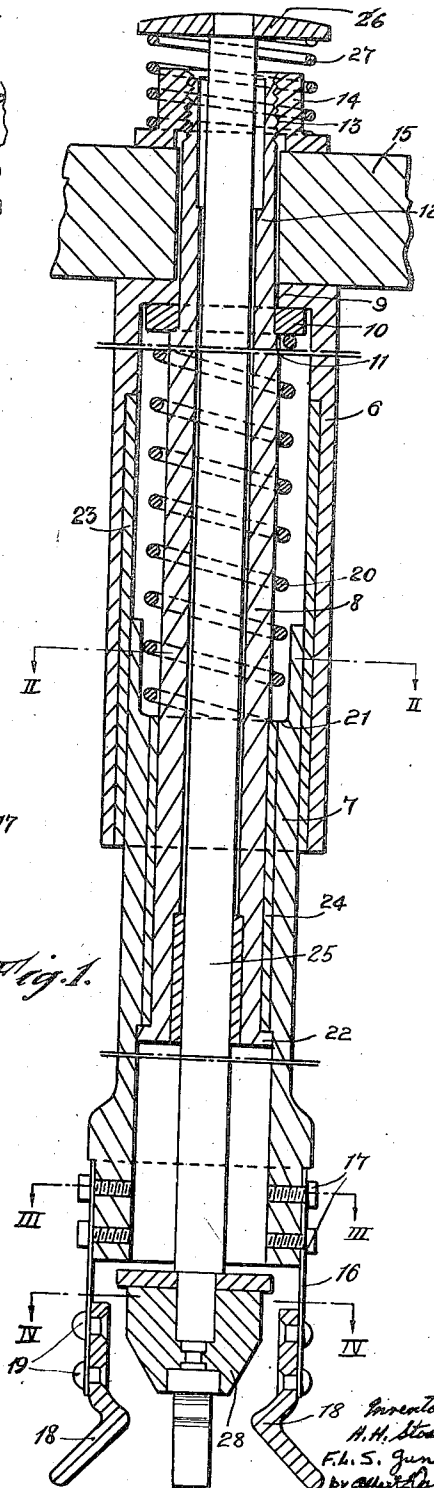


Fig. 4.



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GRIPPING DEVICES FOR HANDLING BOTTLES

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Application September 20, 1955, Serial No. 535,322

4 Claims. (Cl. 294—99)

This invention relates to mechanism for removing bottles in groups from their crates, and is particularly concerned with mechanism for association with bottle uncrating machines, by means of which crates are emptied or unpacked of the bottles, the full crates entering at one point of the machine and the empty crates and bottles leaving at separate points.

A machine of the character in question forms the subject of a co-pending application for British patent No. 18,239 of July 18, 1952, and comprises broadly a conveyor means for feeding a line of loaded crates to an unloading table which presents the crates to mechanism for gripping and lifting the bottles from the crate, and, although intended specially for use with a machine of the character described, is applicable generally to machines for removing bottles from crates such as beer bottles, milk bottles and the like, which are crated for the purpose of transport and returned empty for washing and refilling.

According to the present invention, a gripping member for use in the removal of bottles from crates comprises a spring loaded tubular slide mounted in a tubular housing and spring biased outwardly therefrom and an inner tubular guide member, spring gripping fingers carried by the slide being adapted to hold a bottle neck when sprung thereon and opened to release the bottle by means of a spring loaded plunger extending axially of the guide member and operable by engagement with an abutment to force the bottle from the gripping fingers.

Preferably, a plurality of gripping members are adjustably mounted in a support movable in one direction to engage the gripping members with the bottles and in the reverse direction to engage an abutment whereby the gripping members release said bottles.

The gripping members, being of spring loaded telescopic construction, allow bottles which have slight variations to be picked up, and the gripping fingers are such as will snap over the bottles and allow bottle necks of varying sizes to be gripped. The axially arranged spring loaded plunger will enable the bottle release to be effected at varying points according to bottle heights.

The platen carrying the gripping members may incorporate a series of slots, preferably angular, and so arranged that adjustment can be made for various crate sizes and number of bottles per crate without removing the gripping members from the platen.

A crosshead assembly operated by connecting rod and crankshaft and carrying brackets which extend over an unloading table in accordance with the aforesaid co-pending application for patent supports the platen and means may be provided for adjustment of the trip mechanism to permit of bottles of different heights being unpacked.

In order that the invention may be clearly understood and readily carried into effect reference is directed to the accompanying drawing wherein:

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Fig. 1 is a longitudinal section of a gripping member according to the invention.

Figs. 2, 3 and 4 are sections on the lines II—II, III—III and IV—IV of Fig. 1 respectively and

Fig. 5 is a perspective view of a detail of the bottle release means.

The preferred construction of gripping members as illustrated in the drawing consists of two spring loaded telescoping tubes comprising an outer housing 6 and intermediate slide 7 respectively, and an inner guide tube 8. The outer housing 6 has an internal flange 9 at one end abutting which a washer 10 is placed and adapted to engage a shoulder 11 formed by a reduced part 12 of the inner guide tube 8. The reduced part 12 is screw-threaded as at 13 and by means of a nut 14 the parts 6, 7 and 8 are secured to a platen 15, flanged part 9 of the housing 6 to the inner side. The slide 7 carries at its lower end a number of spring gripping jaws, each comprising blade springs 16 anchored by their one end by screws 17 to the slide and carrying at their other end jaws 18 secured by rivets 19. The gripping jaws when the gripping members are lowered over the bottle snap thereon and grip it ready for removal. A spring 20 disposed between the washer 10 and a shoulder 21 formed by enlarging the bore of the slide 7 maintains the slide 7 and housing 6 in an extended position, the guide tube 8 having an outwardly directed flange 22 to form a limit stop. 23 and 24 are bearing sleeves fitted to the housing 6 and slide 7 respectively.

A plunger 25 extends axially of the inner guide tube 8 and protrudes above the platen 15 in which the gripping members are mounted and is provided with a contact button, a light spring 27 being disposed between the button 26 and the nut 14 to hold the plunger 25 in a position where a nose part 28 secured to the end of the plunger is withdrawn into the gripping member. When the platen 15 is raised, the buttons 26 engage trip mechanism whereby the plungers are depressed. The conical head 23 at its lower end is adapted to engage the bottle top held by the gripping jaws and so push the bottle top therefrom, and free the bottles from the gripping members.

Once the bottles have been gripped by the gripping members, they are lifted clear of the crate, the crate is removed and the bottles released on to a grid table such as described in the aforesaid co-pending application or the like.

The gripping members are arranged on the platen 15 in quadrilateral formation coincident with the group of bottles in the crate, the platen being raised and lowered by known means or by the particular means disclosed in the aforesaid co-pending application. The platen, when raised, brings all the plungers 25 into engagement with a stop plate 29, which engages the contact buttons 26 aforesaid and depresses the axially guided spring loaded plungers 25 to force the bottle necks from engagement with the spring fingers 18.

In order that the gripping members may be adjusted relatively one to the other, that is to say by adjusting the rows of gripping members relatively one to another or the individual gripping members in each row relatively one to another, the platen 15 is provided with a series of slots 30 of angular form which conform with spacing of the groups of bottles in their crates and which permit the individual adjustment of each gripping member in either of two directions at right angles whereby they can be brought into coincidence with the group of bottles which have to be uncrated. In order to adjust the position of the trip mechanism to a point where engagement with the contact button is required, the stop plate 29 is of considerable weight and is slidably mounted by means of pins 31 in a fixed frame member 32 and thus provides

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a cushion abutment for the contact buttons and provision for vertical adjustment of the stop plate as a whole.

It will be appreciated that the invention provides a means whereby bottles can be quickly removed in groups from crates of different sizes, provision being made for variations in height of bottles of the same capacity.

What we claim and desire to secure by Letters Patent is:

1. A gripping member for removing bottles from crates, comprising an outer tubular housing, a spring loaded tubular slide mounted for movement in said outer tubular housing and spring biased outwardly therefrom and an inner tubular guide member mounted in said tubular slide, spring gripping fingers carried by the slide at its lower end to hold a bottle neck when sprung thereon and to be opened to release the held bottle, a spring loaded plunger axially disposed in the inner tubular guide member, and abutment means for engaging and actuating said plunger to force the bottle from the gripping fingers.

2. A gripping member in accordance with claim 1, in which the outer tubular housing is provided at one end with an internal flange, a shoulder on the adjacent portion of the inner guide member adapted to be engaged by said flange, a shoulder on said slide and a helical spring around said inner guide member between said

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shoulders, a platen on said flange, and means for securing the tubular housing and the tubular guide member to the platen, the platen being movable in one direction for bottle engagement and in the opposite direction to engage the abutment means for bottle release.

3. A gripping member in accordance with claim 1, in which each spring gripping finger comprises a blade spring secured at one end to the lower end of the slide and a bottle neck engaging jaw carried by the other end of the blade spring.

4. A gripping member in accordance with claim 3, in which the spring loaded plunger is provided at its lower end with an enlarged head to force a bottle from the jaws of the gripping fingers.

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