Aug. 26, 1947. E. KELLY 2,426,356

BOTTLE HANDLING MECHANISM

Filed Feb. 24, 1945

FIG. 1.

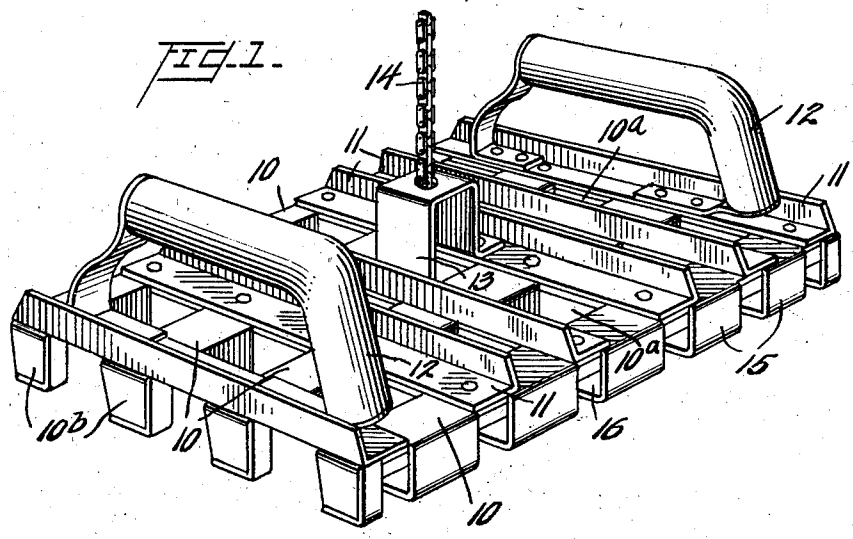


FIG. 3.

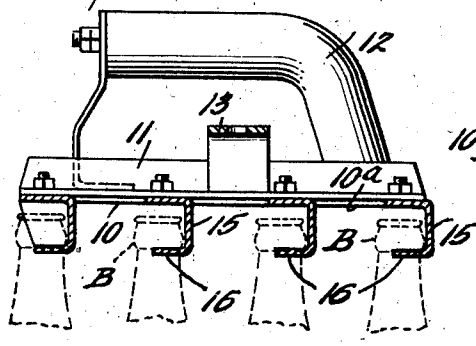


FIG. 4.

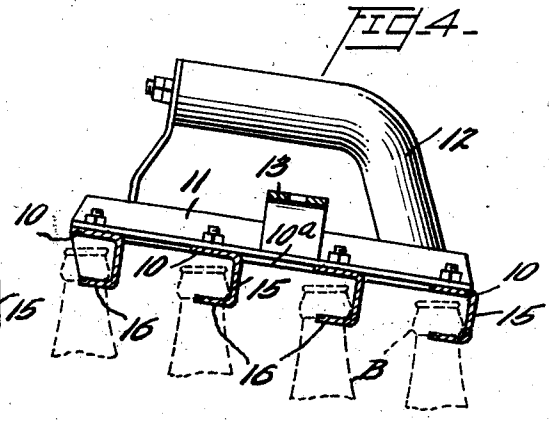
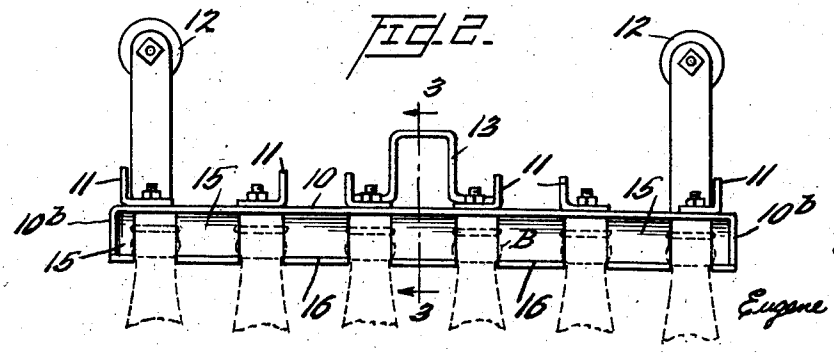


FIG. 2.



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BOTTLE HANDLING MECHANISM

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2 Claims. (Cl. 294—87)

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The present invention pertains to bottle handling apparatus and particularly to devices by means of which a substantial number of bottles may be lifted as a group, transported, and re-deposited in a new location.

In the usual case the beverage manufacturer who distributes his product in glass bottles is equipped with mechanism for washing, sterilizing, and re-filling such bottles. Ordinarily the empty bottles are received at the bottling plant arranged in groups of one or two dozen bottles, each group within a separate case or container, the individual bottles of each group being disposed at right angles to each other. A conventional type of case contains compartments for the reception of twenty-four bottles, this group of bottles being arranged in four rows, with six bottles in each row. Naturally, to facilitate washing, sterilization, and re-filling it is highly desirable that means be provided for lifting the bottles from the container or case as a group rather than singly. Bottle lifting devices having the capacity to engage the necks of a substantial number of bottles simultaneously, so that the entire group may be lifted, have heretofore been proposed and certain devices of this nature have been placed in use.

The purpose of the present invention is to provide a simpler and more effective type of device of this general nature, less expensive to construct and maintain, less complicated and cumbersome in use, and less likely to injure the bottles being lifted and transported than other devices which have been heretofore designed or suggested for the same purpose.

One embodiment of the invention will be disclosed by way of example, but it will be understood by one skilled in the art that, in adapting the same for the handling of bottles which differ in shape, size and weight, minor changes may be made without departing from the teachings of the invention.

In the drawings:

Figure 1 is a perspective view of a preferred form of the bottle handling device;

Figure 2 is a front elevation of the same;

Figure 3 is a section on line 3—3 of Figure 2, showing also the upper ends or necks of certain bottles depending therefrom; and

Figure 4 is a similar view showing the device slightly inclined, in a position which it often assumes when being manipulated, showing the bottles vertically depending from the device notwithstanding its inclination.

Generally speaking, the bottle-lifting, transporting and re-depositing device comprises a frame which, when in operation, is normally disposed in a horizontal or nearly horizontal plane, together with handles rising from the top of the frame and bottle-engaging and lifting elements depending therefrom. The frame of that form of the invention selected for illustration comprises a rectangular plate 10 and a plurality, six in this instance, of transverse stiffening members 11 of angular cross section as shown, to provide maximum strength for a given weight, these transverse members 11 being secured to the upper surface of the plate 10 by means of rivets, bolts, welds, or other suitable securing means. Handles 12 at the ends of the frame permit the operator to grasp it readily and maneuver it with facility. A bracket 13, secured to the horizontal portions of two adjacent angles 11, comprises an anchoring fixture to which the lower end of a suspending chain or cable 14 may be affixed. While the device is lightly constructed, its weight, together with that of a group of bottles, is substantial and it is desirable to provide its operator with counterbalancing mechanism for carrying in large part the weight of the device and suspended bottles during the operation of bottle transfer. The suspending or counterbalancing mechanism, however, comprises no portion of the invention and is not disclosed in detail.

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The actual bottle-engaging means of the device comprises a plurality of bottle contacting elements disposed below the plane of the frame. Each of these elements is, in the form of the invention disclosed, approximately L-shaped in section, including a depending stem part 15 and a transversely disposed terminal portion 16, all of the terminal portions 16 of all of the lifting elements being disposed in a plane substantially parallel to the plane of the plate 10. Preferably the bottle-engaging elements are integral with the frame 10, comprising downturned flange-like parts struck from the body of the plate, the apertures created in the plate by this operation being indicated at 10*a*. These elements, except for those at the ends, are of equal width and are equidistantly spaced apart longitudinally of the plate, as disclosed clearly in Figure 2 of the drawings, and likewise in Figure 1. Downturned flanges 10*b* at the ends of the plate 10 serve as guards, preventing the terminal ends 16 of the outermost bottle-engaging elements from accidentally catching the clothing of the operator or any other object. Each two adjacent bottle-supporting elements together define a bottle neck-receiving notch, the space between the terminal

portions 16 being greater than the diameter of the neck and of a bottle to be supported, but less than the diameter of the bulbous portion B adjacent the mouth of the bottle. A bottle may, therefore, be supported in each such notch upon the adjacent edges of adjacent terminal portions 16 of the lifting elements. When so supported each bottle is restrained against movement in one direction longitudinally of the bottle-receiving notch because of contact of the bulbous portion B of the bottle with the vertically extending adjacent edges of lifting element portions or stems 15. Each bottle engaged by two lifting elements is thus pivotally suspended from the bottle-lifting device when the device is lifted and, if the device is slightly inclined when in operation, as when it is moved to the position in which it is shown in Figure 4, the bottles remain vertically suspended and parallel so that they do not strike or clash against each other while being thus handled.

The lifting device disclosed has a capacity of twenty-four bottles, the bottle-receiving notches being arranged in four rows of six each, and such a group may be engaged prior to lifting by lowering the device toward the bottles until each bottle-receiving notch is directly in rear of the bottle which it is intended to receive. The device is then moved horizontally forward so that the terminal portions 16 of the lifting elements move into position below the several bulbous neck portions B of the bottles, after which the frame may be lifted, the several bottles engaged, and the group moved to a point of disposal, for instance to the conveyor of a washing apparatus. After the bottoms of the bottles have been placed on a support the device may be lowered, retracted, and the bottles disengaged.

The device is of great simplicity, but operates with efficiency to effectively transfer bottles without marring them in any way, is light in weight and has no moving parts. It is of such rugged construction that it is not rendered inoperative wholly or in part by the usual impacts to which it is subjected when in use.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A device for simultaneously lifting and transporting the bottles of a group of bottles arranged in parallel rows and the tops of which are bulbous and disposed approximately in a plane, said device comprising a frame and a plurality of bottle engaging elements projecting downwardly therefrom, said elements being disposed in a plurality of parallel rows, each two adjacent elements being formed and spaced to define a notch adapted to receive with a loose fit the neck of a bottle which is disposed substantially normally to said frame, to engage at two diametrically spaced points the undersurface of the bulbous top of a bottle so positioned and to also engage the side surface of such bulbous top to limit movement of the bottle top along said elements in a direction away from the mouth of the bottle neck receiving notch, each such element being generally L-shaped with one leg portion thereof disposed in a parallelism with the frame and the second leg portion constituting a connection between the first leg portion and the frame, the first mentioned leg portion being disposed to engage the undersurface of a bulbous bottle top and the second mentioned leg portion the side surface of such a bottle top, said device being adapted to be moved in a plane parallel to the plane in which the tops of a plurality of rows of bottles are approximately disposed, to cause the neck of each such bottle to enter a notch between two elements, and to be thereafter elevated to engage the tops of all such bottles and lift the bottles as a group for transportation, the bottles being pivotally suspended so as to hang vertically despite minor tilting movements of the frame during transportation.

2. The device for simultaneously lifting and transporting bottles described in claim 1 in which the frame includes a rectangular plate and each bottle engaging element comprises a rectangular strip one end of which is integral with that plate, the second mentioned leg portion being disposed at right angles to the plate and the first mentioned leg portion being disposed parallel to the plate.

EUGENE KELLY.

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