

[54] **CRATE FOR CARRYING BOTTLES**

[75] Inventor: **Kashichi Hirota**, Tokyo, Japan

[73] Assignee: **Kyowa Denki Kagaka Kabushiki Kaisha**, Tokyo, Japan

[22] Filed: **Sept. 25, 1972**

[21] Appl. No.: **291,526**

936,725	10/1909	Insinger	220/21
1,845,470	2/1932	Wood	206/804
2,194,828	3/1940	Greaves	206/804
2,623,670	12/1952	More	217/20
3,133,660	5/1964	Roberts	220/19
3,606,034	9/1971	Lewis	206/804

Primary Examiner—George E. Lowrance

[30] **Foreign Application Priority Data**

Sept. 23, 1971 Japan..... 46-74487

[52] U.S. Cl..... **220/21, 214/310, 217/20**

[51] Int. Cl..... **B65d 1/24**

[58] Field of Search 220/19, 20, 21; 206/804, 206/DIG. 32; 214/310; 217/18, 19, 20, 21, 22, 23

[56] **References Cited**

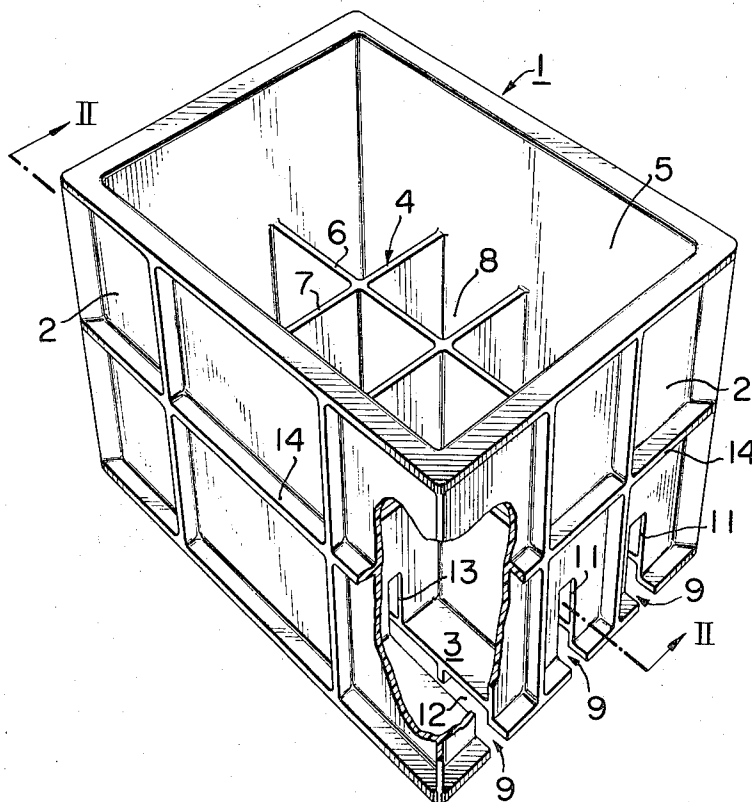
UNITED STATES PATENTS

684,995 10/1901 Lyons 217/22

[57] **ABSTRACT**

A crate for carrying bottles is provided with passages into which plates fixed to a roller conveyor for transporting the crate come, thus facilitating to successively take the bottles out of the crate running on the conveyor.

1 Claim, 3 Drawing Figures



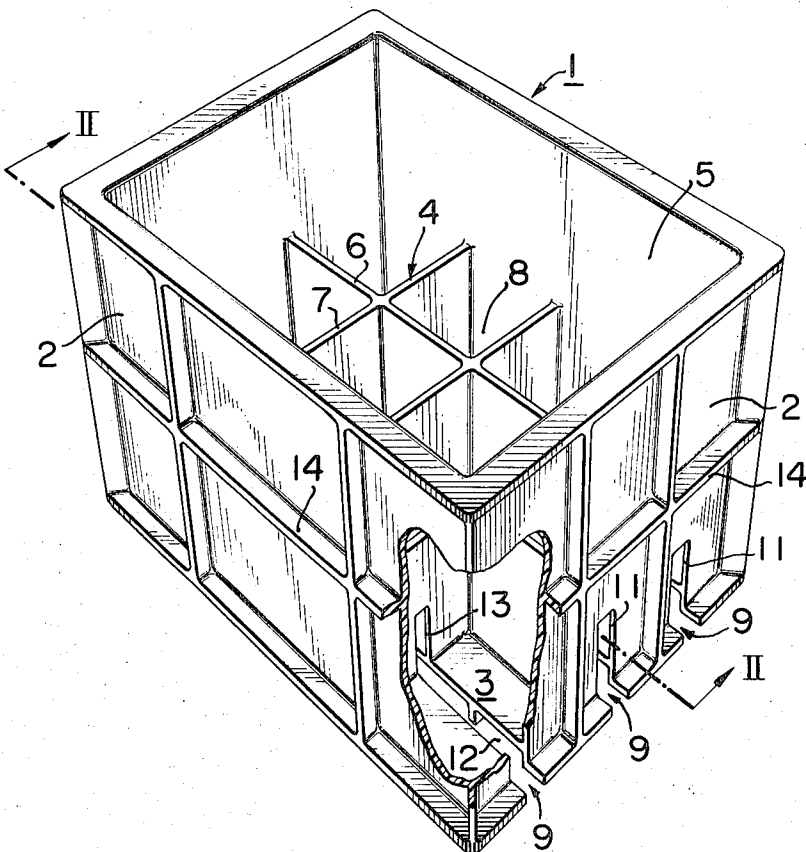


FIG. 1

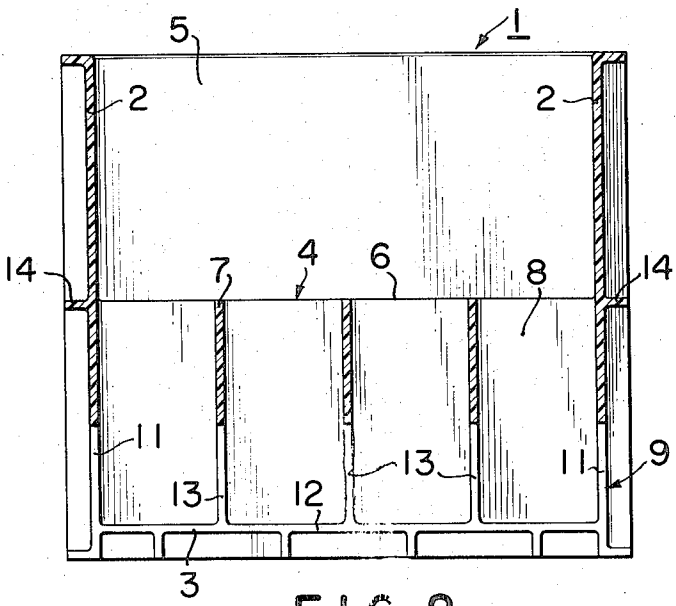


FIG. 2

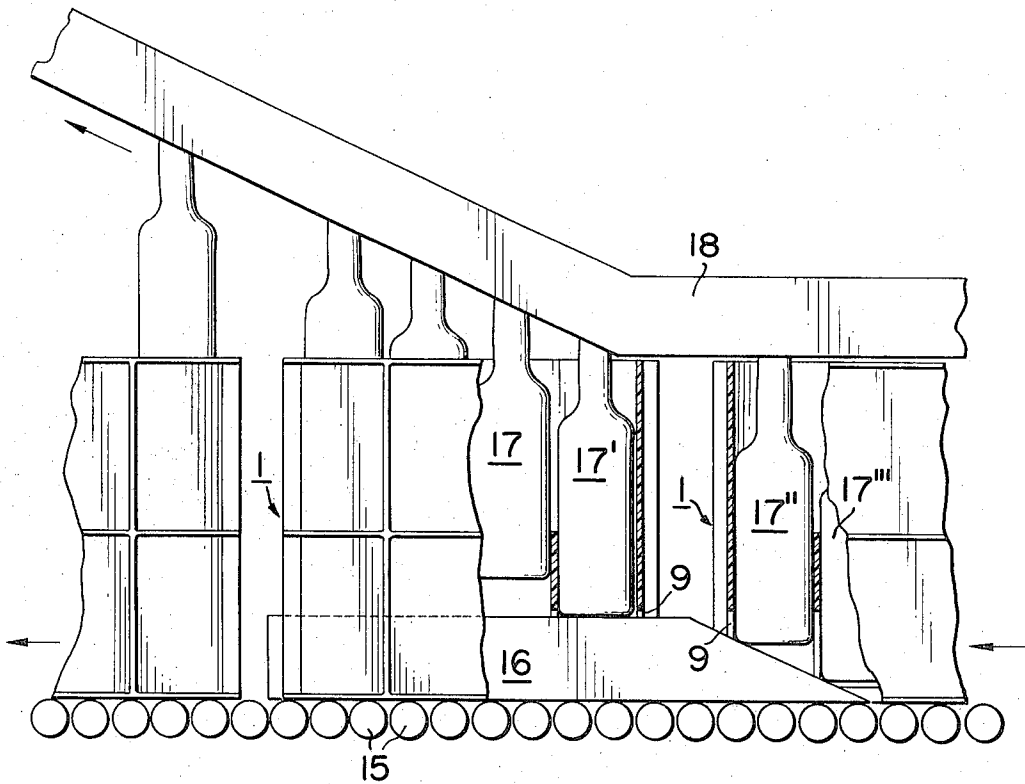


FIG. 3

CRATE FOR CARRYING BOTTLES

BACKGROUND OF THE INVENTION

This invention relates to a crate for carrying bottles, more particularly to an improved crate capable of taking easily the bottles out of the crate having the substantially same depth as a height of the bottle to be carried and resting upon a roller conveyor for transporting the bottles to a bottle washing machine.

Hitherto, it has been not easy to continuously take empty bottles out of a crate having the substantially same depth as the height of the bottle to be contained at a bottle washing plant, because a proper operation of a bottle gripping machine above the crates resting upon the conveyor, which transports them toward the bottle washing machine, is prevented by the relatively high wall of the crate. For the reason, the prior art for taking the bottles out of the crate with the high side wall is such that the bottle gripping machine is manipulated to hold the bottles in the crate from above just when the movement of the crate on the conveyor stops intermittently. However, this type of the apparatus is complicate in structure and low in efficiency.

BRIEF SUMMARY OF THE INVENTION

In a crate for carrying bottles according to the present invention, it is advantageously possible to continuously take bottles out of a crate with an outer wall of the substantially same depth as a height of a bottle to be carried, on the ground that the crate in accordance with the invention is provided with at least one passage on a lower central portion of each section adapted to receive a bottle to be carried and the passage allows the crate running on the conveyor to straddle a plate fixed to the conveyor for raising bottles in the crate upward. When the crate is moving on the conveyor, a tapered portion of the plate firstly enters the passage of the crate and then a tip portion of the plate meets a bottom of the bottle. With the further movement of the crate, the inclined portion of the plate acts to lift the bottle up above the top portion of the side wall of the crate to facilitate the gripping of the bottle. Thus, it becomes possible to successively take the bottles out of the crate running on the conveyor.

An object of the present invention is to provide a crate with passage adapted to straddle plates on a conveyor.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the present invention will become apparent from the following description with reference to an preferred embodiment shown in the accompanying drawings, wherein:

FIG. 1 is a partially broken away-perspective view showing a crate in accordance with the present invention;

FIG. 2 is a cross-sectional view taken along an arrow II—II of FIG. 1; and

FIG. 3 is an elevation view showing a condition taking bottles out of the crate.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIG. 1, an appearance of a crate for embodying the present invention is of a conventional type which has a peripheral wall 3 and a partition 4 for forming sections 8 adapted to receive bottles to be carried. The partition 4 consists of longitudinally extend-

ing partitions 6 and transversely extending partitions 7 which serve to separate an inner chamber 5 of the crate into the desired number of the sections 8. Each of the sections has a dimensions sufficient to receive the bottle to be carried and the partition has a height of approximately one half of the depth of the crate.

The crate embodying the present invention is provided with passages 9 extending in one direction into which can come plate 16 projecting upward of a plain surface of a roller conveyor 15 for transporting the crates toward the bottle washing machine. The passages 9 are located at the lower central portion of the sections 8 and parallel to one side wall of the crate. The passages 9 each is defined by cutout portions 11 in the side wall, an elongated hole 12 in the bottom wall and cutout portions 13 in the transversely extending partition 7. The cutout portions 11, 13 and the hole 12 are aligned each other to define the passage 9 in a straight line. The passage 9 is given one for a row of the sections and each passage is in parallel. If desired, both longitudinally and transversely extending passages may be provided.

Preferably, the crate may be formed integrally by moulding a plastic material and also may be reinforced with ribs 14 so as to impart an adequate rigidity and strength to the crate. Further, although the crate for one dozen has been illustrated, it should be noted that the size or capacity of the crate does not form a subject matter of the present invention.

Referring to FIG. 3, the crate with the passage 9 is ridged on the conveyor 15 for transporting it toward the bottle washing machine (not shown). As the plates 16 which are fixed to the roller conveyor 15 have at its rear portions inclined or tapered portion, the foremost bottles in the crate will be raised upward when the plates 16 enter the passages 9 and meet the bottoms of the bottles 17''. With the further forward movement of the crate, the plates further enter the interior of each passage and the bottles 17'' are further raised up. At the same time the head portions of the bottles are above the top portion of the side wall of the crate, a bottle gripping machine 18 starts to hold or grip the bottles 17'' projecting above the top portion of the side wall of the crate. The gripped bottles 17'', 17', 17 will be brought successively to the bottle washing machine. By running the bottle washing machine and the conveyor at the same speed in side-by-side relation, it is possible to successively take the bottles in the crate out of the crate without the need of the intermittent of the conveyor and the bottle gripping machine such as the prior arts. As the crate on the conveyor and the bottle gripping machine above the crate run at the same speed, the bottles of which the heads are gripped are moved together with the crate and taken out of the crate.

Several modifications to the foregoing described embodiments may be made without departing from the scope of the present invention. Accordingly, any such modifications are intended to be encompassed by the present invention.

What is claimed is:

1. In combination a conveyor for transporting crates containing bottles toward a bottle gripping machine, each crate having a bottom wall to be received on the conveyor, peripheral walls upstanding from the bottom wall with spaced first and second walls generally parallel to each other and joined with spaced third and

3

fourth wall extending generally transversely to the first and second walls, first partition walls within the container and extending generally parallel to the first and second walls and between the third and fourth walls, these partition walls intersecting second partition walls extending generally transversely to and between the first and second walls, the partition walls defining section in which individual bottles are received with their bottom resting on the bottom wall and their head portions at the upper open end of the crate, the bottle gripping machine being disposed in spaced relation to the conveyor and over the open ends of the crates passing on the conveyor, this machine adapted to receive the head portions of the bottles and remove the bottles from the crate, the improvement which comprises means defining openings in the lower portions of said first and second peripheral walls, means defining openings in the lower portions of the first partition walls

4

lying respectively between said third and fourth walls and said second partition walls and adjacent pairs of said second partition walls, and still further means defining openings in said bottom wall of the crate that extends between said first and second walls and aligned with the openings on said first and second walls and with the openings on said first partition walls, and ramp means fixedly disposed with respect to the conveyor to lie in longitudinal alignment within the path of movement of the openings in said bottom wall of the crate whereby as a crate passes over said ramp means this means moves through the aligned openings in the crate to contact the bottoms of the bottles in the respective sections and lift these bottles upwardly to a position where the top portions of the bottles project beyond the crate and can be operatively received in the bottle gripping machine.

* * * * *

20

25

30

35

40

45

50

55

60

65