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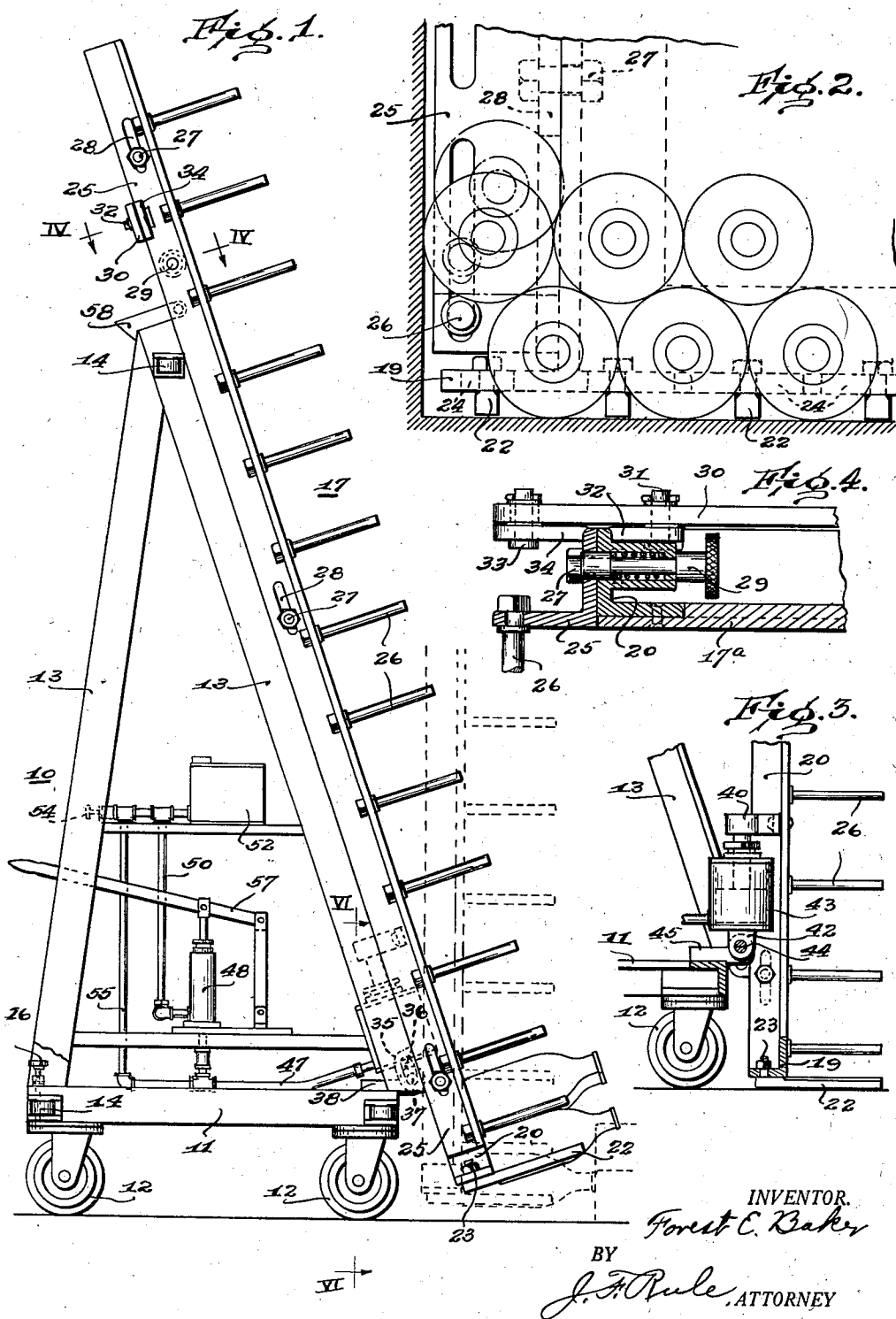
F. E. BAKER

2,058,397

BOTTLE TIERING APPARATUS

Filed March 13, 1935

3 Sheets-Sheet 1



INVENTOR.

Forest C. Baker

BY

J. A. Rule, ATTORNEY

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Fig. 6.

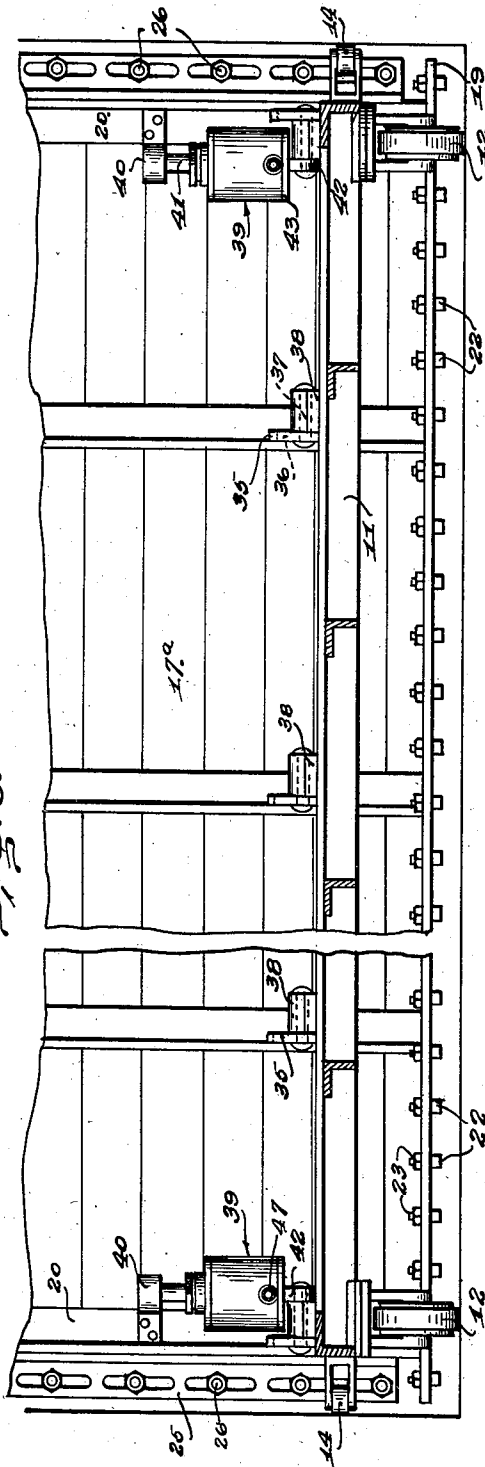
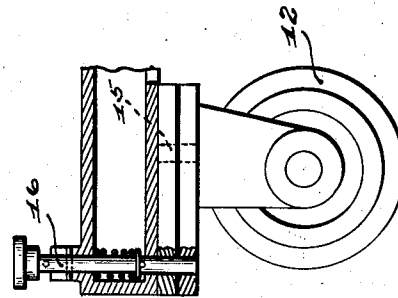


Fig. 8.

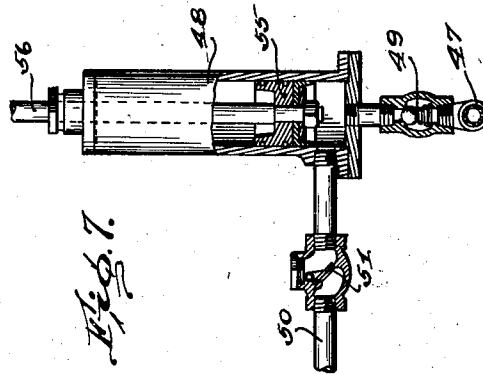


Fig. 7.

INVENTOR.
F. E. Baker
BY
J. H. Rule
ATTORNEY

UNITED STATES PATENT OFFICE

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BOTTLE TIERING APPARATUS

Forest E. Baker, South Charleston, W. Va., assignor to Owens-Illinois Glass Company, a corporation of Ohio

Application March 13, 1935, Serial No. 10,839

11 Claims. (Cl. 214—65)

The present invention relates to improvements in apparatus for transferring and tiering bottles and the like articles and is particularly concerned with apparatus for facilitating the transfer of a tier of bottles from the discharge end of a glassware annealing leir direct to the position it will finally occupy in a freight car or truck during shipment.

Ordinarily, bottles or similar articles which are to be shipped in bulk are piled in tiers in a freight car or truck after having been conveyed from the leir to the car in boxes, small trucks, etc. Such procedure involves considerable, and in fact unnecessary, handling of the bottles and frequently results in excessive breakage or chipping thereof.

An object of the present invention is to avoid the above noted objections and provide a simple means whereby the bottles may be arranged in a tier on a portable carrier or rack at the time they are removed from and sorted at the discharge end of the annealing leir and on said carrier transferred in tier form to a freight car or truck and properly positioned therein.

Another object is the provision of a portable apparatus assuming the form of a wheeled rack on which the bottles are piled in tier form at the leir, this rack being adapted for ready removal from supporting engagement with a tier of bottles after proper positioning thereof in a car or truck.

A further object of the invention is the provision of means whereby an apparatus of the above character may be adjusted to accommodate bottles or other similar articles of different diameters.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is an end elevational view of the bottle tiering apparatus.

Fig. 2 is a fragmentary front elevational view of one lower corner of the apparatus.

Fig. 3 is a fragmentary side elevational view showing one of the two motors for elevating the bottle rack.

Fig. 4 is a fragmentary sectional elevational view taken substantially along the line IV—IV of Fig. 1.

Fig. 5 is a front elevational view of the tiering apparatus or rack.

Fig. 6 is a fragmentary rear elevational sectional view of the apparatus taken substantially along the line VI—VI of Fig. 1.

Fig. 7 is a fragmentary detail view showing the pump and valves associated therewith.

Fig. 8 is a detail sectional elevational view of one of the detents employed in locking certain of the casters in position.

The illustrated embodiment of the invention includes a rack carrier 10 which consists of a rectangular horizontal base 11, mounted on casters 12 and a superstructure made up of inclined bars 13. The lower ends of these bars are suitably anchored to the front and rear longitudinal side members of the base 11 and have their upper ends secured together and to a top bar 13^a in any approved fashion. Anti-friction rollers 14 are provided at the opposite ends of the base 11 and in proximity to the upper ends of the inclined bars 13, for engagement with the side walls of a freight car or truck during movement of the apparatus in the latter as will be apparent hereinafter. For the greater part, the structure consists of angle iron bars. Four casters 12 support the apparatus, each of the casters being mounted upon a vertical hinge pin 15 and adapted at times to be held against movement about said pin by a spring pressed detent 16. It will thus be seen that these casters may be permitted to move about their pivots and thereby facilitate steering of the apparatus.

The bottle rack 17, on which the bottles, or other containers are stacked in tier form and transported to the freight car or the like, is mounted on the carrier in such fashion that it may occupy an inclined position spaced above the floor and thereby support the bottles or other containers while they are being conveyed to the car, or an upright position (see dotted line showing in Fig. 1) in which the bottles are placed in approximately their final position for shipment. The rack includes a rectangular frame made up of horizontal upper and lower bars 18 and 19 respectively, connected by end bars 20 and a series of intermediate cross bars 21. Boards 17^a suitably attached to the frame, assist in supporting bottles on the rack. A longitudinal series of bottle supporting fingers 22 is arranged along the lower margin of the lower bar 19, said fingers being adjustably connected to the latter by bolts 23 or the like fasteners, which extend through slots 24 in said lower bar. Thus, the fingers may be spaced apart to accommodate bottles and jars of different diameters, or certain of the fingers completely removed if necessary.

Attached to each end bar 20 is a shiftable finger carrier 25 supporting a series of fingers 26. Each finger carrier 25 is slidingly connected to the

corresponding end member 20 by bolts 27 which extend through aligned slots 28 in the carrier and end member. These two elements are normally held against relative longitudinal movement by a manually operable spring pressed detent 29 (Fig. 4) disposed in proximity to a hand lever 30 by means of which the finger carrier 25 may be shifted lengthwise of the corresponding end member 20. This lever 30 is pivoted to a hinge pin 31 carried by a bracket 32 on the end member 20 and is connected through a pivot pin 33 and arm 34 to the corresponding finger carrier 25. Thus, it is evident that by withdrawing the two detents 29 and moving the end levers 30 upwardly, the finger carriers 25 may be moved downwardly to disengage the fingers 26 from bottles or the like, as will be apparent presently.

Connection between the bottle rack and carrier 10 whereby the former may be swung between upright and inclined positions and moved vertically while in an upright position, may be obtained in the following manner. Each of the intermediate cross members 21 adjacent its lower end, carries a slotted arm 35, the slot 36 therein extending parallel with the length of the member and accommodating one end of a horizontal hinge pin 37 mounted in a bracket 38 attached to the forward margin of the base 11. The end members 20 are connected to the base 11 through a pair of fluid piston motors 39, which are employed to control the movements of the bottle rack on the carrier 10. Specifically, each of these units includes a bracket 40 connecting the corresponding end cross member 20 and the piston rod 41 of the motor 39 and a finger 42 on the lower end of the motor cylinder 43 connected by means of a hinge pin 44 and bracket 45 to the base 11.

These piston motors 39 are connected through pipes 46 and 47 (Figs. 1 and 5) to the lower end of a pump 48, there being a check valve 49 in the pipe 47 preventing flow of fluid from the motors to said pump. This pump 48 is connected by means of a pipe 50 including a check valve 51 to a reservoir 52 for oil or the like. Just below the check valve 49 the pipe 47 is connected to a return pipe 53 and manually controlled valve 54 with the reservoir 52. Within the pump 48 is a piston 55 connected to a piston rod 56 which in turn is pivoted to an operating lever 57. By operating the pump 48, the oil is drawn from the reservoir through the check valve 51 and supplied to the lower ends of the motors 39 by way of the check valve 49 and pipes 47 and 46. Thus, the bottle rack may be moved upwardly on the carrier 10. A latch 58 pivoted to the upper portion of the bottle rack is adapted to take over the upper margin of the cross bar 13^a which connects the upper ends of the pairs of inclined bars 13.

In operation, the apparatus will be placed in proximity to the discharge or delivery end of an annealing leer, the bottle rack being spaced above the floor and occupying an inclined position in which it rests in part on the inclined bars 13 as shown in Fig. 1. The bottles are placed thereon as indicated in Figs. 2 and 5, the lower horizontal row being supported on the fingers 22 and the bottles at each end of the tier being held in proper position by the fingers 26 on the finger carriers 25. Upon completion of the tiering operation, the apparatus is rolled into a freight car or the like, at which time, the detents 16 are released to secure the rear casters 12 in alignment with the front casters. Thereupon the apparatus is pushed into proximity to one end of the car or the tier which has been previously posi-

tioned. The latch 58 is then released and the entire bottle rack shifted forwardly about the hinge pins 37 and 44 to an upright position as indicated by dotted lines in Fig. 1. The valve 54 is then opened, allowing the oil in the lower end of the motors 39 to return to the reservoir 52. This operation lowers the entire rack (Fig. 2) and brings the bottles or other articles into engagement with the floor of the car. Continued downward movement of this rack disengages the fingers 22 from the bottles. The detents 29 are then withdrawn from engagement with the finger carriers 25 and the hand levers 30 operated to move said finger carriers downwardly a short distance relative to the end members 20. This operation results in movement of certain of the bottles into engagement with the side walls of the car and separation of the fingers 26 from said bottles. At this point, the entire apparatus may be backed away from the tier of bottles, leaving the latter in the desired position.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. Apparatus of the character described comprising a wheeled carrier, an inclined support rising from said carrier, a bottle rack, means providing pivotal and sliding connection between lower portions of the rack and the carrier in proximity to the lower end of the inclined support, a longitudinal series of bottle supporting fingers arranged along the lower margin of the rack, a series of bottle supporting fingers arranged at each end of the rack and extending upwardly in a direction at right angles to the other series of fingers, means whereby a predetermined degree of downward movement of the rack while in a vertical position brings the bottles along the lower margin of the rack into engagement with a stationary horizontal support and separates the lower series of fingers from the bottles and means for moving the other series of fingers downwardly out of supporting engagement with the bottles at the opposite ends of the tier.

2. Apparatus of the character described comprising a wheeled carrier, an inclined support rising from said carrier, a bottle rack, means providing pivotal and sliding connection between lower portions of the rack and the carrier in proximity to the lower end of the inclined support, a longitudinal series of bottle supporting fingers arranged along the lower margin of the rack, a series of bottle supporting fingers arranged at each end of the rack and extending upwardly in a direction at right angles to the other series of fingers, means whereby a predetermined degree of downward movement of the rack while in a vertical position brings the bottles along the lower margin of the rack into engagement with a stationary horizontal support and separates the lower series of fingers from the bottles, means for moving the other series of fingers downwardly out of supporting engagement with the bottles at the opposite ends of the tier and means including fluid operated piston motors for imparting upward movement of the rack relative to the carrier.

3. Apparatus of the character described comprising a wheeled carrier, an inclined support rising from said carrier, a bottle rack, means providing pivotal and sliding connection between lower portions of the rack and the carrier in proximity to the lower end of the inclined support, a longitudinal series of bottle supporting

fingers arranged along the lower margin of the rack, a series of bottle supporting fingers arranged at each end of the rack and extending in a direction at right angles to the other series of fingers, means whereby a predetermined degree of downward movement of the rack while in a vertical position brings the bottles along the lower margin of the rack into engagement with a stationary horizontal support and separates the lower series of fingers from the bottles, means for moving the other series of fingers downwardly out of supporting engagement with the bottles at the opposite ends of the tier, means including fluid operated piston motors for imparting upward movement of the rack relative to the carrier and separate means for separably connecting the upper portions of the bottle rack and inclined support to secure the former against premature downward movement.

4. In a portable bottle tiering apparatus, the combination of a wheeled carrier including an inclined rack support, a bottle rack, pin and slot connectors securing adjacent lower portions of the rack and support together and providing for swinging and substantially vertical sliding movement of the rack relative to the support, a series of bottle supporting fingers extending along the lower and side margins of the rack and means for effecting and regulably controlling movement of the rack relative to the support to thereby remove the fingers along the lower margin of the rack from supporting engagement with the bottles.

5. In a portable bottle tiering apparatus, the combination of a wheeled carrier including an inclined rack support, a bottle rack, pin and slot connectors securing adjacent lower portions of the rack and support together and providing for swinging and substantially vertical sliding movement of the rack relative to the support, a series of bottle supporting fingers extending along the lower and side margins of the rack, means providing pivotal and sliding connection between the lower portions of the rack and support, said means including a pair of piston motors each comprising a cylinder and a piston rod, a horizontal pivot pin connecting each motor cylinder to the carrier, a bracket connecting the piston rod of each motor to the bottle rack, means for operating the motors to move the rack upwardly relative to the support and means whereby the motors may be employed to regulably control the speed of downward movement of the rack under its own weight.

6. In a portable bottle tiering apparatus, the combination of a wheeled carrier including an inclined rack support, a bottle rack, pin and slot connectors securing adjacent lower portions of the rack and support together and providing for swinging and substantially vertical sliding movement of the rack relative to the support, a series of bottle supporting fingers extending along the lower and side margins of the rack, means providing pivotal and sliding connection between the lower portions of the rack and support, said means including a pair of piston motors each comprising a cylinder and a piston rod, a horizontal pivot pin connecting each motor cylinder to the carrier, a bracket connecting the piston rod of each motor to the bottle rack, means for operating the motors to move the rack upwardly relative to the support, means whereby the motors may be employed to regulably control downward movement of the rack under its own weight and means whereby the series of bottle support-

ing fingers along the end margins of the rack may be moved lengthwise of said end margins relative to the other fingers.

7. Apparatus of the character described, comprising a wheeled carrier, an inclined bottle rack support rising therefrom, a bottle rack slidably and pivotally connected to the inclined support, a series of bottle supporting fingers arranged along the lower and side margins of the rack, said rack adapted to occupy an inclined position in engagement with the support during stacking of a tier of bottles thereon and positioned upright preparatory to releasing the tier of bottles and mechanism for imparting movement to the rack relative to said support, and means for effecting downward movement of the rack while in an upright position and thereby separate the fingers at the lower margin of the rack from the bottles.

8. Apparatus of the character described, comprising a wheeled carrier, an inclined bottle rack support rising therefrom, a bottle rack slidably and pivotally connected to the inclined support, a series of bottle supporting fingers arranged along the lower and end margins of the rack, said rack adapted to occupy an inclined position in engagement with the support during stacking of a tier of bottles thereon and positioned upright preparatory to releasing the tier of bottles and pneumatic means for moving the rack upwardly relative to said support, said pneumatic means operating to cushion and regulably control the speed of downward movement of the rack and a tier of bottles thereon relative to said support.

9. Apparatus of the character described, comprising a wheeled carrier, an inclined bottle rack support rising therefrom, a bottle rack slidably and pivotally connected to the inclined support, a series of bottle supporting fingers arranged along the lower and end margins of the rack, said rack adapted to occupy an inclined position in engagement with the support during stacking of a tier of bottles thereon and positioned upright preparatory to releasing the tier of bottles, mechanism for imparting movement to the rack relative to said support and means for moving the series of fingers at the end margins in the direction of the length of said margins independently of the remaining portion of the rack.

10. Apparatus of the character described, comprising a wheeled carrier, an inclined bottle rack support rising therefrom, a bottle rack slidably and pivotally connected to the inclined support, a series of bottle supporting fingers arranged along the lower and end margins of the rack, said rack adapted to occupy an inclined position in engagement with the support during stacking of a tier of bottles thereon and positioned upright preparatory to releasing the tier of bottles, pneumatic means for moving the rack upwardly relative to said support, said pneumatic means operating to cushion and regulably control the speed of downward movement of the rack and a tier of bottles thereon relative to said support and means for moving series of fingers at the end margins in the direction of the length of said margins independently of the remaining portion of the rack.

11. Apparatus of the character described, comprising a wheeled carrier, an inclined bottle rack support rising therefrom, a bottle rack slidably and pivotally connected to the inclined support, a series of bottle supporting fingers arranged along the lower and end margins of the rack,

said rack adapted to occupy an inclined position in engagement with the support during stacking of a tier of bottles thereon and positioned upright preparatory to releasing the tier of bottles and mechanism for imparting movement to the rack relative to said support, slide bars carrying

the bottle supporting fingers at the end margins of the rack, means slidably connecting the bars to the rack proper and manually controlled means for effecting movement of the bars in the direction of their length.

FOREST E. BAKER.