March 14, 1944. P. C. READ 2,344,000

BOTTLE CARRYING CONVEYER FLIGHT

Filed June 4, 1941

Fig. 1.

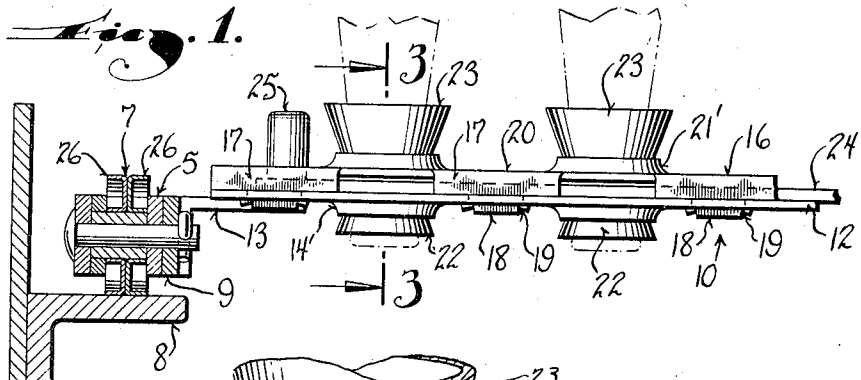


Fig. 5.

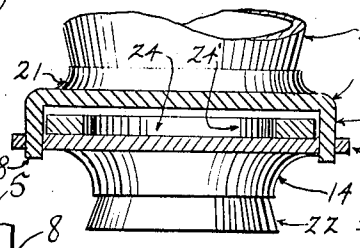


Fig. 2.

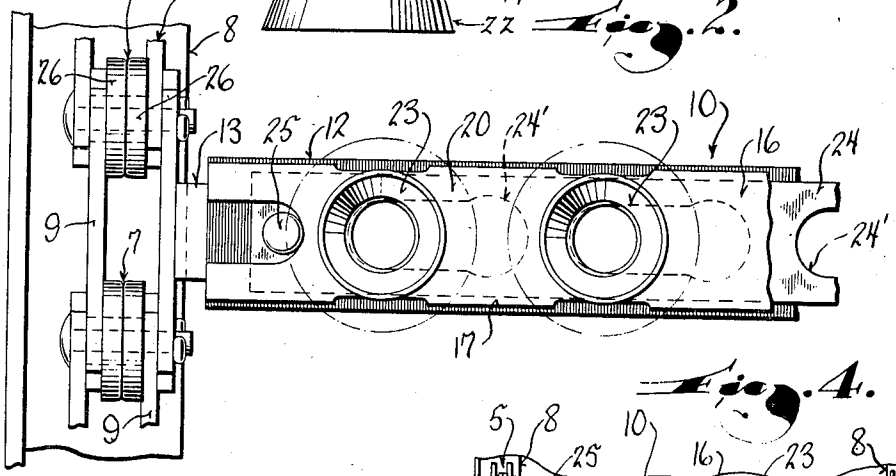


Fig. 4.

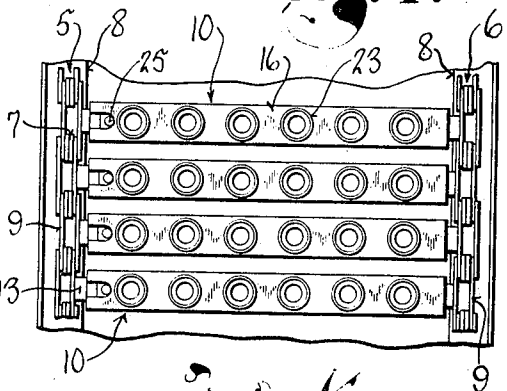
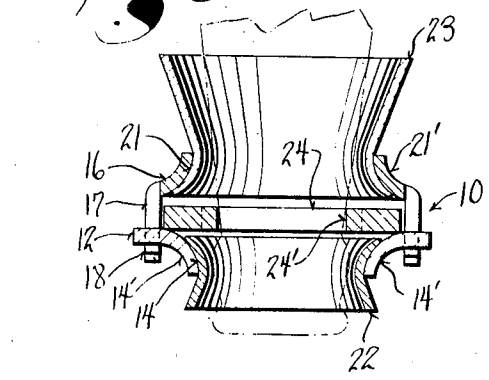


Fig. 3.



Inventor
Philip C. Read
By
Attorney

Patented Mar. 14, 1944 2,344,000

UNITED STATES PATENT OFFICE

2,344,000

BOTTLE CARRYING CONVEYER FLIGHT

Philip C. Read, Shorewood, Wis., assignor to Dostal & Lowey Co., Inc., Menomonee Falls, Wis., a corporation of Wisconsin

Application June 4, 1941, Serial No. 396,560

10 Claims. (Cl. 198—131)

This invention relates to bottle handling equipment and refers more particularly to a bottle carrying conveyer flight of the type used in bottle washing machines.

In view of the relatively great length of these conveyers, light weight construction is extremely desirable, and it is, therefore, an object of this invention to provide a conveyer flight of the character described which is fabricated entirely from sheet metal to obtain the desired lightness without sacrificing strength.

The conveyer flights with which this invention is especially concerned have bottle neck receiving sockets spaced along the length thereof and retaining means such as a sliding locking plate operable to engage and hold bottles received in the sockets.

In keeping with the primary objective of this invention which is to insure lightness coupled with strength, it is another object of this invention to provide a novel manner of forming the bottle receiving sockets.

The conveyer flight of this invention follows past practice to the extent that it consists of an elongated tubular structure having superimposed top and bottom walls. These top and bottom walls have aligned holes for the reception of the bottle necks and carry the socket structures which serve to guide the bottles into position and hold them against excessive tilting. The means for releasably securing the bottles in their sockets is slidable within the tubular structure.

To insure adequate cleaning of the neck portions of the bottles, it is necessary that the flight be cut away adjacent to the sockets so that water has adequate access to and from the interior of the sockets.

Inasmuch as the entire flight of this invention is fabricated from sheet metal, the ports or openings provided by these cut away portions are preferably in the side walls of the tubular unit. This, unless compensated for, would result in a weakened structure. To offset this possible weakness, it is a further object of the present invention to so form the sockets that the superimposed top and bottom walls are reinforced thereby so that the structure as a whole has adequate stiffness and rigidity throughout its entire length notwithstanding its cut away side wall portions.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view partly in section and partly in side elevation illustrating one end portion of a conveyer flight constructed in accordance with this invention;

Figure 2 is a top plan view thereof;

Figure 3 is a detail cross sectional view taken through Figure 1 on the plane of the line 3—3;

Figure 4 is a top plan view on a reduced scale showing a portion of a conveyer made up of the flights of this invention; and

Figure 5 is a detail cross sectional view taken through Figure 1 on a plane passing between the bottle receiving sockets of the flight.

Referring now particularly to the accompanying drawing, in which like numerals indicate like parts, the numerals 5 and 6 designate two conveyer chains each having rollers 7 adapted to run on supporting tracks 8, and links 9. Alternate links of the two chains are connected by the flights of this invention designated generally by the numeral 10.

Each flight 10 comprises a substantially flat cross bar 12 having its ends welded or otherwise secured to brackets 13 which in turn are suitably secured to the links of the conveyer chains. This flat cross bar is stamped from a single sheet of relatively heavy sheet metal and has a plurality of holes 14 at spaced intervals along the length thereof.

Superimposed upon the flat supporting bar 12 is a complementary cross member 16. This member is essentially a channel mounted on the bar 12 with its open side facing down so that its flanges 17 rest on the bar 12. At spaced intervals these flanges 17 have rivet forming tongues 18 projecting therefrom to pass through slots in the bar 12.

The ends of these tongues 18 are riveted or swedged over as at 19 or spot welded to the bar 12 to thus securely hold the channel and the bar 12 together and form a rigid flat tubular structure.

The web 20 of the channel has holes 21 in line with the holes 14 of the flat bar. The edges of the holes 14 and 21 are extruded outwardly to form flared necks 14' and 21', respectively to which conical or funnel-like bushings 22 and

23 are secured. These bushings coact with each other and the flared necks to provide bottle receiving sockets into which the bottles to be carried may be inserted in inverted positions as shown in Figure 1.

The bottles are held in place in their sockets by a latch plate or slide 24 reciprocable within the hollow flight. This latch plate may be of any suitable design or construction and in the embodiment illustrated consists merely of a bar of relatively heavy sheet stock having keyhole shaped openings 24' formed therein. The large ends of these keyhole shaped openings, upon alignment with the sockets permit insertion of the bottle necks into the sockets or their removal therefrom, while the narrower portions of the keyhole openings are of a size to engage the bottle necks beneath their bulbous enlargements at their mouths.

In the operation of a machine with which flights of this character are used the latch bar is shifted from one position to the other by suitable shifting means (not shown) engageable with a pin or boss 25 fixed to the latch plate and extending upwardly therefrom.

It is to be observed that the flanges 17 which form the side walls of the tubular flight structure are cut away adjacent to each socket. This is done to asure free access for water and cleaning fluid to the neck portions of the bottles in the sockets to make certain that neck labels will be washed off. However, as will be readily apparent, this interruption of the flanges 17 adjacent to the sockets if not compensated for, would result in weakening the flight against bending stresses.

The novel manner in which the bottle sockets are formed offsets this possible weakening. The outward extrusion of the edges of the holes 14 and 21 to form the flared necks stiffens the web of the channel and the flat bar 12 and inasmuch as the diameter of these flared necks is large enough to span the space between adjacent sections of the side wall forming flanges 17 it follows that these flared necks coact with the flange portions to provide stiffness and rigidity for the entire length of the flight.

Reinforcement is further provided by the manner in which the bushings 22 and 23 are attached. The small diameter ends of the funnel-like bushings as clearly shown in Figure 3 are flared or rolled out over the inner surfaces of the extruded flared necks. In this manner, added rigidity is obtained while at the same time the bushings are secured in place in an exceedingly simple manner.

In keeping with the spirit of this invention the rollers 7 are also formed of sheet metal. They consist of two identical stamped cup shaped units 26 welded together back to back, the hubs for the wheels, like the rims, being formed by integral annular flanges.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art that this invention not only provides an exceedingly light and strong bottle carrying flight structure suitable for bottle washing machines, but that it likewise effects substantial economy in cost of manufacturing flights of this character.

What I claim as my invention is:

1. A flight for bottle carrying conveyers and the like comprising: an elongated tubular body structure composed of connected pieces fabricated from sheet metal, said body structure having bottle receiving sockets at spaced intervals along the length thereof, each socket comprising a funnel shaped bushing having its small diameter end fitting into a hole in a wall of the body structure, the peripheral edge portions of the holes being extruded outwardly toward the large diameter ends of the bushings, and the small diameter ends of the bushings being flared outwardly over the inner surface of said extruded portions so that the bushings are secured in place while the wall in which the hole is formed is reinforced against bending stresses.

2. A bottle carrying conveyer flight for use in bottle washing machines and the like for carrying bottles by their necks comprising: a substantially flat bar having bottle neck receiving openings therein; a formed sheet metal channel in superimposed relation with said flat bar with its open side facing the same and the edges of its flanges abutting the adjacent flat face of the bar; integral rivet portions on the edges of the flanges on said channel passing through holes in said flat bar to secure the channel and bar together and form a rigid tubular structure, the web of said channel having bottle neck receiving openings in line with the openings of the flat bar; and a locking bar slidable in the channel and operable to engage and grip bottle necks disposed in said openings.

3. A bottle carrying conveyer flight for use in bottle washing machines and the like for carrying bottles by their necks comprising: spaced sprocket chain links; a rigid cross member securely fastened to said links and having a plurality of bottle neck receiving openings spaced along the length thereof; a formed sheet metal channel disposed over said cross member with the open side of the channel facing the cross member and the edges of its flanges engaging the same; rivet portions on said edges of the channel passing through apertures in the cross member to secure the channel to the cross member and form a rigid tubular structure, the web of the channel having bottle neck receiving openings in line with those of the cross member; a latch member slidable in the channel and having means adapted to engage and hold the necks of bottles received in said openings, the bottle neck receiving openings in the channel having their peripheral portions extruded outwardly; and centering funnels having their small ends disposed in said extruded portions with the extremities of their small ends flared out to secure the centering funnels to the channel.

4. A bottle carrying conveyer flight comprising: an elongated tubular structure fabricated from sheet metal and having substantially flat top and bottom walls connected by side wall sections spaced apart to provide water ingress and egress ports along the length of the unit, said side wall portions reinforcing the unit against bending stresses, the substantially flat top and bottom walls having aligned holes for the reception of bottle necks, said holes being located at the points where the side wall sections are omitted and having their peripheral portions extruded outwardly; and funnel-like socket structures connected with one of the substantially flat walls to facilitate insertion of the botle necks into said holes, the small ends of the funnel-like socket structures being disposed in said extruded peripheral portions of the holes with the extremities of the small ends of the socket structures flared outwardly to secure the same to the flight and

to reinforce the flight across the spaces intervening between the side wall sections so that said socket structures cooperate with the side wall sections to provide rigidity against bending.

5. A bottle carrying conveyer flight comprising: an elongated tubular unit fabricated from sheet metal and having superimposed substantially flat top and bottom walls connected at spaced intervals along the length thereof by side wall portions, said substantially flat top and bottom walls having aligned holes, the marginal edge portions of which are extruded outwardly to form flared necks encircling the holes, said holes being located adjacent to the ports provided by the intervening spaces between the side wall portions and the diameter of said flared necks being sufficient to substantially bridge the intervening spaces between the side wall portions so that the flared necks cooperate with the side wall portions to provide rigidity against bending for the elongated tubular unit; funnel-like bushings having their small diameter ends disposed in the holes with their small diameter end portions rolled over the inner surface of the flared necks to rigidly secure the funnel-like bushings in place and provide bottle receiving sockets; and means disposed within the tubular unit for engaging and holding bottle necks received in said sockets.

6. A bottle carrying conveyer flight comprising: a channel-like member stamped and formed from sheet metal and having bottle receiving holes in its web at spaced intervals along the length thereof with the edge portions of the holes extruded outwardly to provide flared necks encircling the holes, the flanges of the channel being interrupted adjacent to the holes so that the flanges of the channel consist of endwise spaced sections; a complementary member secured to said flange sections to substantially close the channel, said complementary member having holes in alignment with those of the channel web, said flared necks which encircle the holes in the channel reinforcing the web against bending at the intervening spaces between adjacent flange sections; funnel-like bushings having their small diameter ends secured to said flared necks and providing bottle neck receiving sockets, said sockets additionally reinforcing the channel web; and means for holding bottles disposed in said holes.

7. A bottle carrying conveyer flight comprising: an elongated tubular unit consisting of complementary pieces stamped and formed from sheet metal and rigidly secured together, said unit having superimposed substantially flat top and bottom walls connected at spaced intervals along the length thereof by side wall sections integral with one of said pieces, and said substantially flat top and bottom walls having aligned bottle neck receiving holes opposite the spaces intervening between the adjacent side wall sections so that water and cleaning fluid have ready access to the neck portions of bottles in the holes; socket means at the holes in one of said superimposed walls; and means for securing the socket means in alignment with said holes including integral flared necks encircling the peripheries of the holes in said last designated wall extruded outwardly of said wall and engaging the socket means, said necks and socket means reinforcing the flight across the intervening spaces between the side wall sections and thereby cooperating with the side wall sections in providing rigidity for the elongated tubular unit.

8. A bottle carrying conveyer flight comprising: an elongated tubular unit having substantially flat top and bottom walls connected by side walls integral with one of said first named walls; said side walls having portions carried thereby engaged with opposite sides of the other of said substantially flat walls to hold said walls rigidly jointed together; said substantially flat top and bottom walls having aligned holes adapted to receive the necks of bottles; means within the tubular unit adapted to engage and hold bottles to the flight; the side walls of the unit being cut away adjacent to each of the bottle receiving holes so as to afford access for water and cleaning fluids to the necks of bottles in said holes; and a flared neck portion circumscribing each hole and integral with the walls in which said holes are formed to reinforce said walls and the side walls at their cut away areas, said neck portion extending substantially entirely across the dimension of the unit between the side walls thereof and protruding outwardly of the tubular unit to cooperate with the uncut areas of the side walls in providing rigidity against bending for the entire length of the tubular unit.

9. A bottle carrying conveyer flight for use in bottle washing machines and the like comprising: complementary cross members fabricated of sheet metal, one of said cross members being substantially channel-shaped in cross section, the other cross member being substantially flat and secured to the channel-shaped cross member with one flat face abutting the edges of said flanges so as to give the flight a substantially flat tubular cross section; said cross members having aligned bottle neck receiving holes therein; the flanges of the channel-shaped cross member being cut away adjacent to the bottle receiving holes; and means at said holes for reinforcing the cross members to offset the loss of stiffness occasioned by the channel flanges being cut away at said points and to center bottles having their necks inserted in said holes, said means including flared necks integral with the cross members and extruded outwardly from the edges of the holes in said members.

10. In a bottle carrying conveyer flight for use in bottle washing machines and the like comprising: complementary cross members fabricated of sheet metal, one of said cross members being substantially channel-shaped in cross section, the other cross member being substantially flat; means on the flanges of the first designated cross member for securing the other cross member thereto with one flat face of said other cross member abutting the edges of said flanges so as to give the flight a substantially flat tubular cross section; said cross members having aligned bottle neck receiving holes; the flanges of the channel-shaped cross member being cut away adjacent to the bottle receiving holes; and means at the holes integral with the cross members for reinforcing the same to offset the loss of stiffness occasioned by the channel flanges being cut away at said points.

PHILIP C. READ.