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K. K. WRIGHT

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APPARATUS FOR CLEANING BOTTLES

Filed May 5, 1928

2 Sheets-Sheet 1

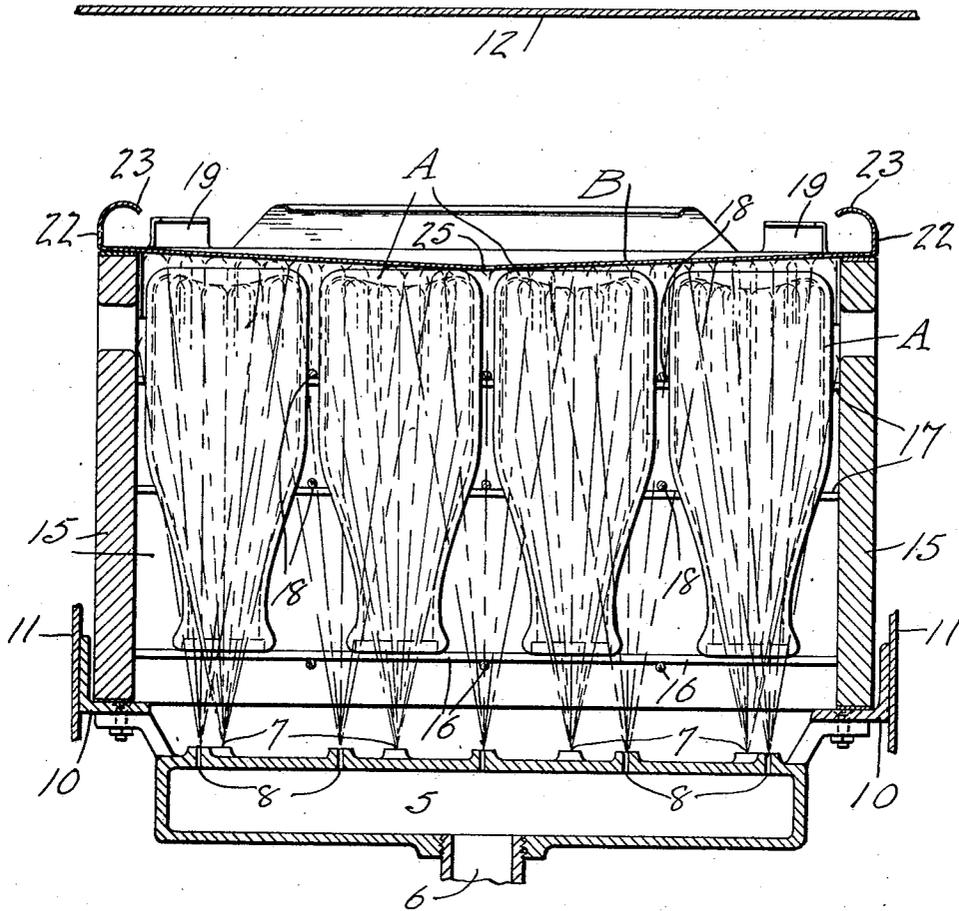


Fig. 1.

INVENTOR.
Kirk K. Wright
by *Barber & Prochnow*
ATTORNEYS.

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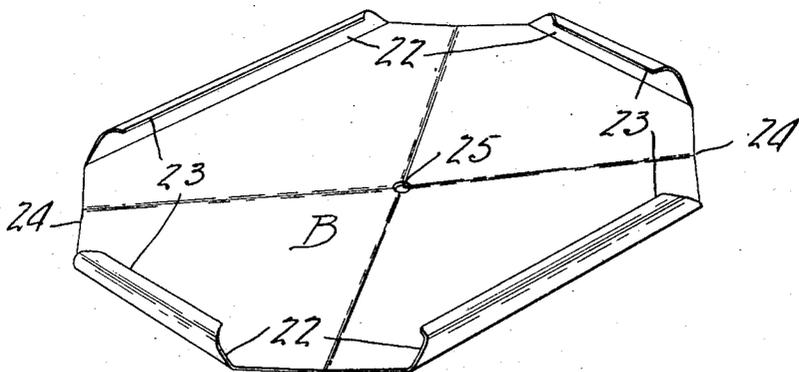
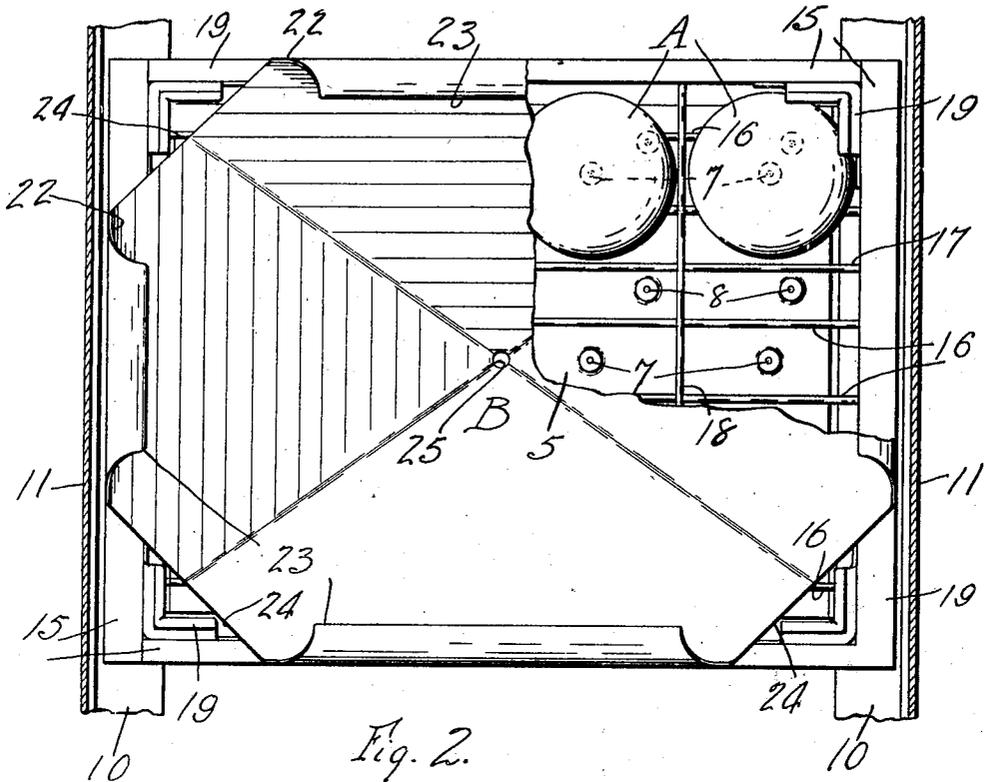
K. K. WRIGHT

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2 Sheets-Sheet 2



INVENTOR.
Kirk K. Wright
by Parker & Prochnow
ATTORNEYS.

UNITED STATES PATENT OFFICE

KIRK K. WRIGHT, OF KENMORE, NEW YORK

APPARATUS FOR CLEANING BOTTLES

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This invention relates to apparatus for cleaning bottles and more particularly to bottles contained in crates or cases.

The objects of this invention are to provide apparatus by means of which the outer surfaces of bottles arranged in crates may be more efficiently washed than has heretofore been possible, without the use of means for directly scrubbing the exteriors of the bottles; also to provide a deflecting or splash plate which may be used in connection with the washing of bottles of this kind; also to improve apparatus of this kind in other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a transverse sectional elevation of a washing apparatus showing in section a crate of bottles in operative position thereto and by means of which apparatus my process may be carried out.

Fig. 2 is a top plan view of a crate having a splash plate arranged thereon, the plate being partly broken away to show the jet plate or box of the bottle washing machine.

Fig. 3 is a perspective view of the splash plate.

It has been customary heretofore to wash milk bottles or the like by placing the same in inverted position into the usual bottle crates, and then subjecting the bottles to a series of jets of liquid which pass between the usual wires or rods near the bottom of the crate and on which the bottles stand. Bottle crates are commonly made to hold either twelve milk bottles of one quart size or twenty bottles of one pint size, and the crates for either quarts or pints are approximately of the same length and breadth. Consequently the spray plates or devices, over which the inverted bottles are placed in a crate, are provided with orifices arranged to project jets of liquid upwardly substantially centrally into the open mouths of the bottles.

Consequently these spray devices are provided with twelve jets spaced to cooperate with twelve quart bottles in a crate, and twenty other jets spaced to cooperate with the pint bottles in the crate. When quart bottles are washed the sprays provided for the pint bottles are used to splash the exteriors of the

bottles and similarly when pint bottles are washed the sprays of the quart bottles are used to wash the exteriors of the pint bottles.

In bottle washing machines as heretofore made such portions of the sprays as were projected upwardly between the bottles of the crate were of very little or no help in washing the exteriors of the bottles since these portions of the sprays would pass upwardly between the bottles without washing the bottles.

I have found that the cleaning of the exteriors of bottles in crates can be greatly improved by providing a splash surface immediately over the crate so that the sprays of liquid passing upwardly between the bottles will strike the splash surface and be splashed or deflected downwardly and at various angles upon the exteriors of the inverted bottles. These deflected or splash sprays strike portions of the bottles which could not be reached by upwardly directed sprays and for this reason effect a much more thorough cleaning of the bottles, since the exterior surfaces thereof are cleaned both by the direct action of the sprays of liquid, and by the deflected or splashed sprays.

By positioning these splash surfaces in close proximity to the bottles or crates an effective splashing or deflection of the spray passing between the bottles results so that the splashed or deflected liquid strikes the bottles with considerable force.

If the splash surfaces were located at a distance above the crate or case of bottles as is the case with the usual roof or top of a bottle washing machine, the sprays of liquid passing between the bottles would lose so much of their velocity by the time they impinge upon the elevated surfaces that no finely divided splash results and any spray which strikes such a surface does not have sufficient force to be thrown or deflected back at the bottles with enough force to effectively clean the exteriors thereof.

In Fig. 1 is shown by way of example a bottle cleaning or washing apparatus embodying my invention. The machine shown has the usual jet plate or box 5 having an inlet 6 for liquid to be sprayed at the bottles,

and having a series of orifices 7 in the upper surface thereof arranged to spray jets of liquid into the open mouths of the inverted quart bottles, and other orifices 8 which are spaced to cooperate in a similar manner with
 5 pint bottles. The jet plate or box is mounted on angle bars or guide rails 10 which serve as guides for advancing the crates into operative position over the jet plate, and for removing
 10 the same from such operative position. 11 represents the exterior or side walls of the bottle washing machine and 12 represents the top wall thereof which, as is customary, is positioned at a considerable distance above
 15 the top of the crate. In the case of many machines now constructed this top wall 12 is arranged at sufficient elevation above the plates so that milk cans may be washed in the same machine as crates of bottles. The
 20 machine thus far described is not by itself new and may be of other construction if desired.

The washing apparatus described is adapted to cooperate with bottle crates or cases of the usual construction and the particular
 25 crate shown is provided with the usual side and end walls 15. The bottles A are adapted to rest upon a wire grating 16, suitably secured to the walls 15 of the crate or case.

Consequently when the bottles are placed
 30 into the crate in inverted position as clearly shown in Fig. 1, the jets or sprays of cleansing fluid may pass upwardly between the wire or rods of the grating 16 of the crate, for washing the bottles. The crate is also provided
 35 with longitudinal and transverse wires, other spacing members 17 and 18 arranged between the top and bottom of the crate for spacing the bottles from each other. These spacing members are preferably formed of wire as
 40 shown and when so formed do not interfere to any material extent with the free upward movement of portions of sprays in the spaces between the bottles. The crates are also
 45 usually provided at the upper corners thereof with corner or angle members 19 which extend upwardly above the upper edges of the walls of the crates and which facilitate the stacking of the crates one upon another and also serve
 50 to secure the side walls together. Crates or cases of other construction may be used in connection with my improved apparatus.

A splash plate or surface is provided above
 55 and in close proximity to the bottles contained in the crates or cases. This may be done by providing a fixed plate over each spray device 5 or if desired the plate may be made removable and placed upon each crate when the same is moved into operative relation to the spray plate or box. The splash
 60 plate B in the particular construction shown is preferably made of metal having the edges turned upwardly as indicated at 22, and then bent inwardly toward each other as indicated
 65 at 23 to facilitate handling of the plate and to reinforce the same against bending or def-

ormation. The corners of the plate are preferably cut away as shown at 24 so that when the plate is positioned upon a crate, the corner pieces 19 may extend upwardly through the cut-away corner portions of the plate.
 70 These cut-away corner portions of the plate also cooperate with the corner pieces 19 to facilitate the positioning of the plates on the crates or cases.

The plate is preferably so constructed that
 75 any liquid which may find its way to the top surface of the plate will be drained, and for this purpose in the construction shown, the plate is slightly depressed or dished toward the middle portion thereof and is provided
 80 with a hole or aperture 25 through which water or other liquid may drain. The plate may however, be flat or of any other suitable construction, if desired.

By using the plate B described, the lower
 85 surface of the plate is very close to the bottoms of the inverted bottles and is in such close proximity thereto that any portions of sprays which strike the plate will have sufficient
 90 velocity to be deflected or splashed from this plate in different directions and with sufficient force to effectively remove dirt or foreign matter from any portions of the exteriors of the bottles which these deflected
 95 sprays may strike. It will be obvious that the deflected sprays will strike portions of the bottles which cannot be reached by the upwardly directed sprays and also some of the deflected or splashed sprays will strike
 100 dirt or foreign matter on the outside surfaces of the bottles at different angles from the upwardly directed sprays and assist the direct sprays in removing dirt or foreign matter from the bottles, thus clearly increasing
 105 the efficiency of the apparatus. It has been found by actual experience that the number of bottles which have not been washed sufficiently clean after the first passage through a washing apparatus is very
 110 materially reduced by the use of my apparatus embodying this invention.

Another advantage of the apparatus is that efficient use is made of the sprays passing
 115 upwardly between bottles, as well as of sprays which strike the sides of the bottles and are then deflected upwardly against the splash surface.

By using the apparatus described, the
 120 splashing of liquids beyond the walls of the case is practically prevented, so that the operator of the apparatus can feed cases containing bottles to and remove them from the apparatus without becoming excessively
 125 splashed. By thus confining the spray or splash, the mixing of different liquids used in connection with the cleaning of bottles is also prevented, thus improving the cleaning of bottles, particularly in the case of apparatus in which the bottles are first subjected
 130 to a spray of a solution containing alkali and

then to a spray of rinsing water. By means of the apparatus described the splashing of the alkali into the rinsing water is prevented.

I claim as my invention:

5 1. A bottle cleaning apparatus including a support for a crate with open top and bottom and adapted to contain bottles arranged with their mouths downwardly, spraying means arranged in operative relation to said support
10 for directing sprays of liquid upwardly at the bottles and between the bottles, and a splash plate removably positioned on the upper portion of said crate above said bottles and against which sprays passing upwardly
15 downwardly against said bottles, said plate having the edges thereof bent upwardly to facilitate handling of said plate and to reinforce the same.

20 2. A bottle cleaning apparatus including a support for a crate adapted to contain bottles arranged with their mouths downwardly, spraying means arranged in operative relation to said support for directing sprays of
25 liquid upwardly at the bottles and between the bottles, and a splash plate removably positioned on the upper portion of said crate above said bottles and against which sprays passing upwardly between bottles impinge
30 and are splashed downwardly against said bottles, said plate having means for draining liquid from the upper surface thereof.

3. A bottle cleaning apparatus including a support for a crate adapted to contain bottles
35 arranged with their mouths downwardly, spraying means arranged in operative relation to said support for directing sprays of liquid upwardly at the bottles and between the bottles, and a splash plate removably positioned on the upper portion of said crate
40 above said bottles and against which sprays passing upwardly between bottles impinge and are splashed downwardly against said bottles, said crate having corner pieces extending upwardly above the top edge of the
45 crate, said plate having the corners thereof cut away to permit said plate to rest upon the top edge of the crate and to facilitate positioning of the plate on the crate.

50 KIRK K. WRIGHT.

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