Oct. 18, 1966 A. DREW 3,278,971

CASE CLEANING APPARATUS

Filed July 13, 1964 4 Sheets-Sheet 1

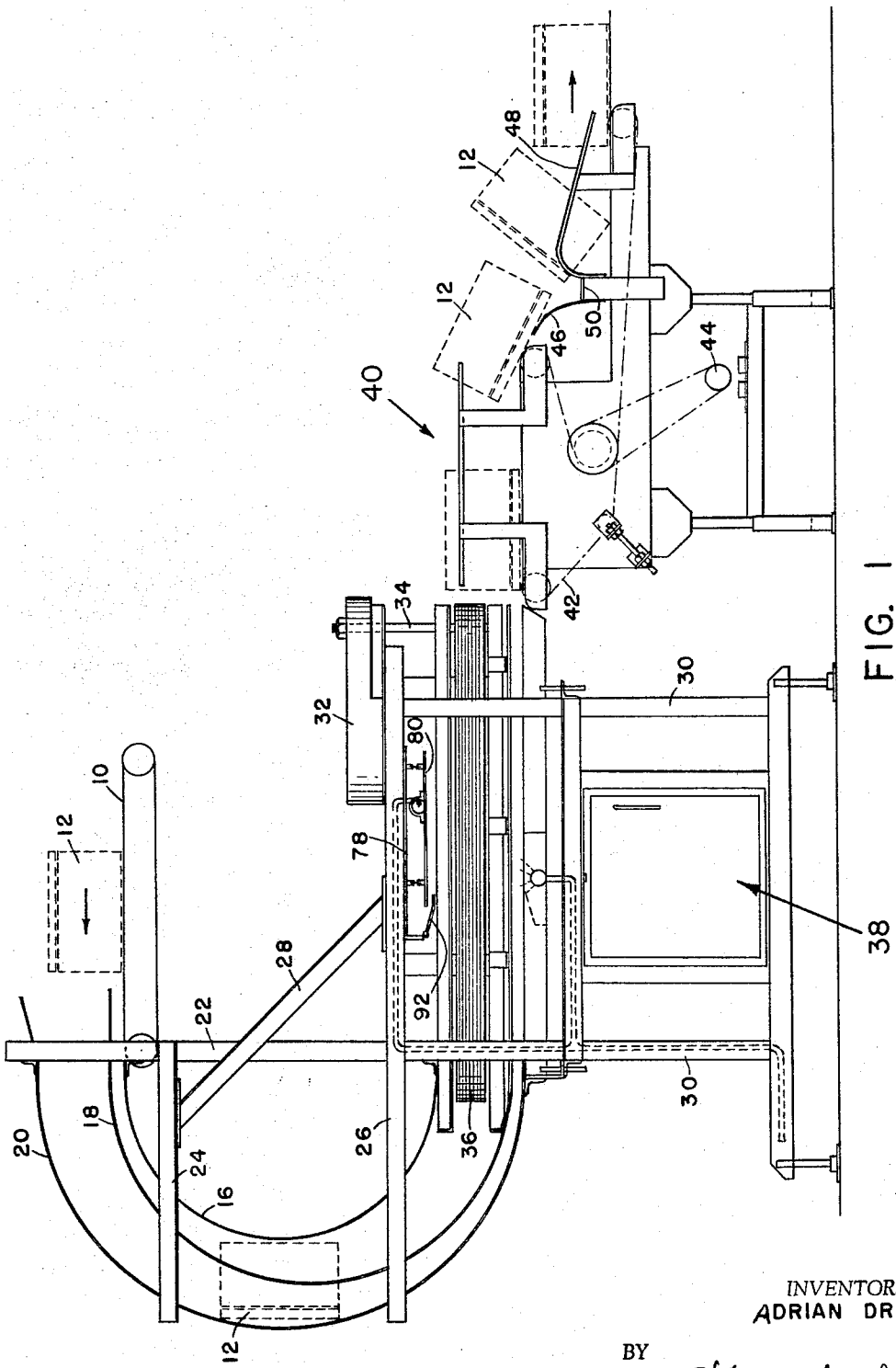


FIG. 1

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CASE CLEANING APPARATUS

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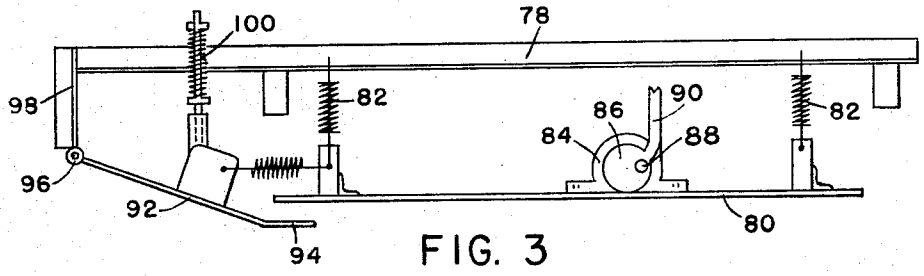


FIG. 3

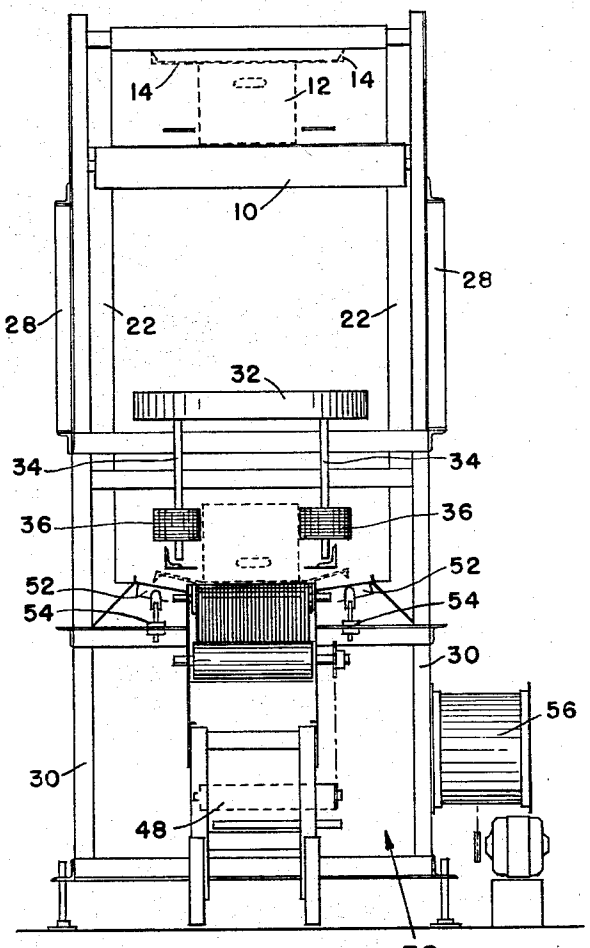


FIG. 2

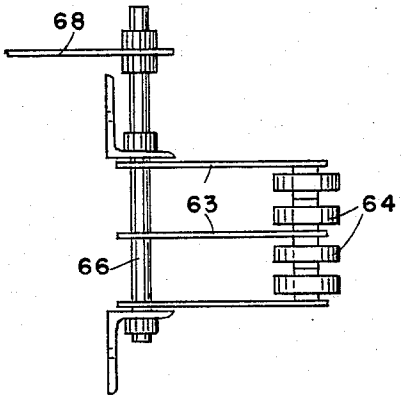


FIG. 4

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CASE CLEANING APPARATUS

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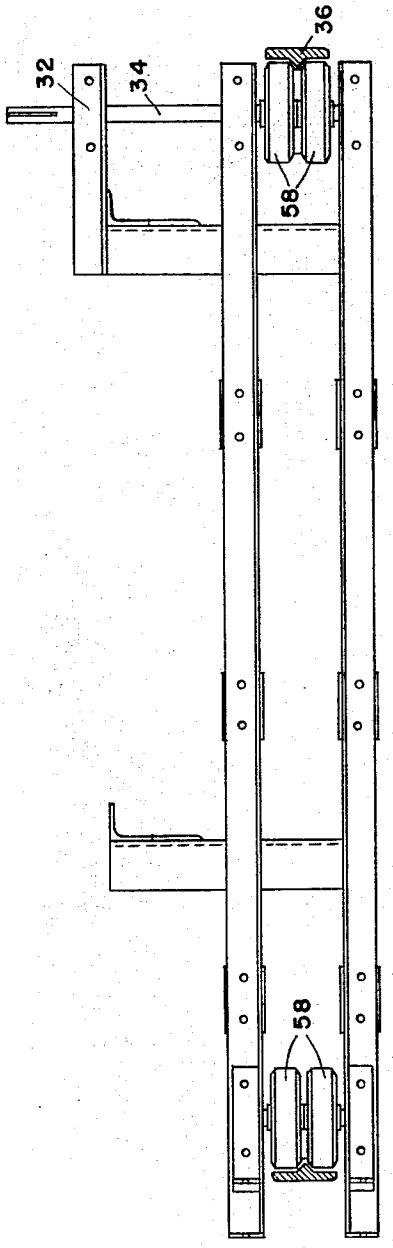


FIG. 5

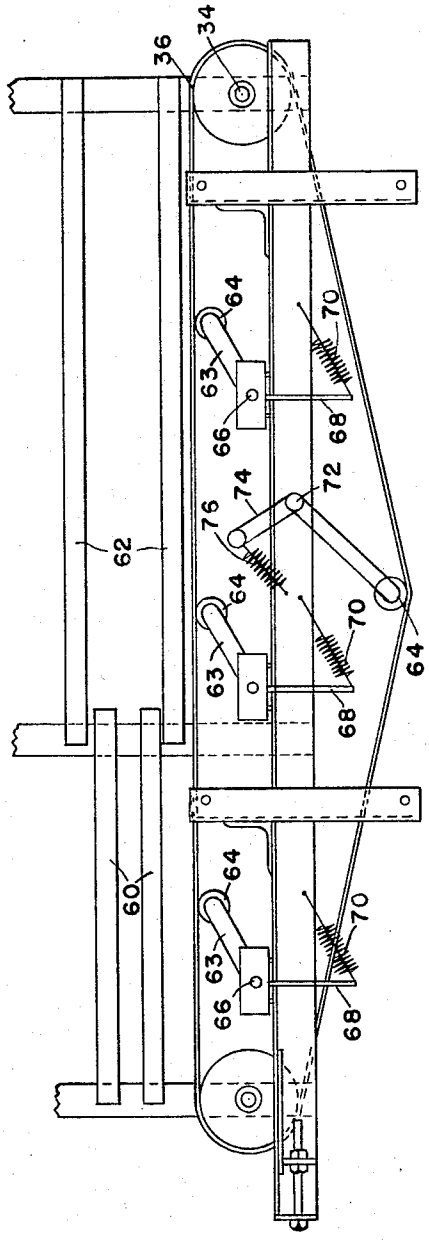


FIG. 6

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CASE CLEANING APPARATUS

Filed July 13, 1964 4 Sheets-Sheet 4

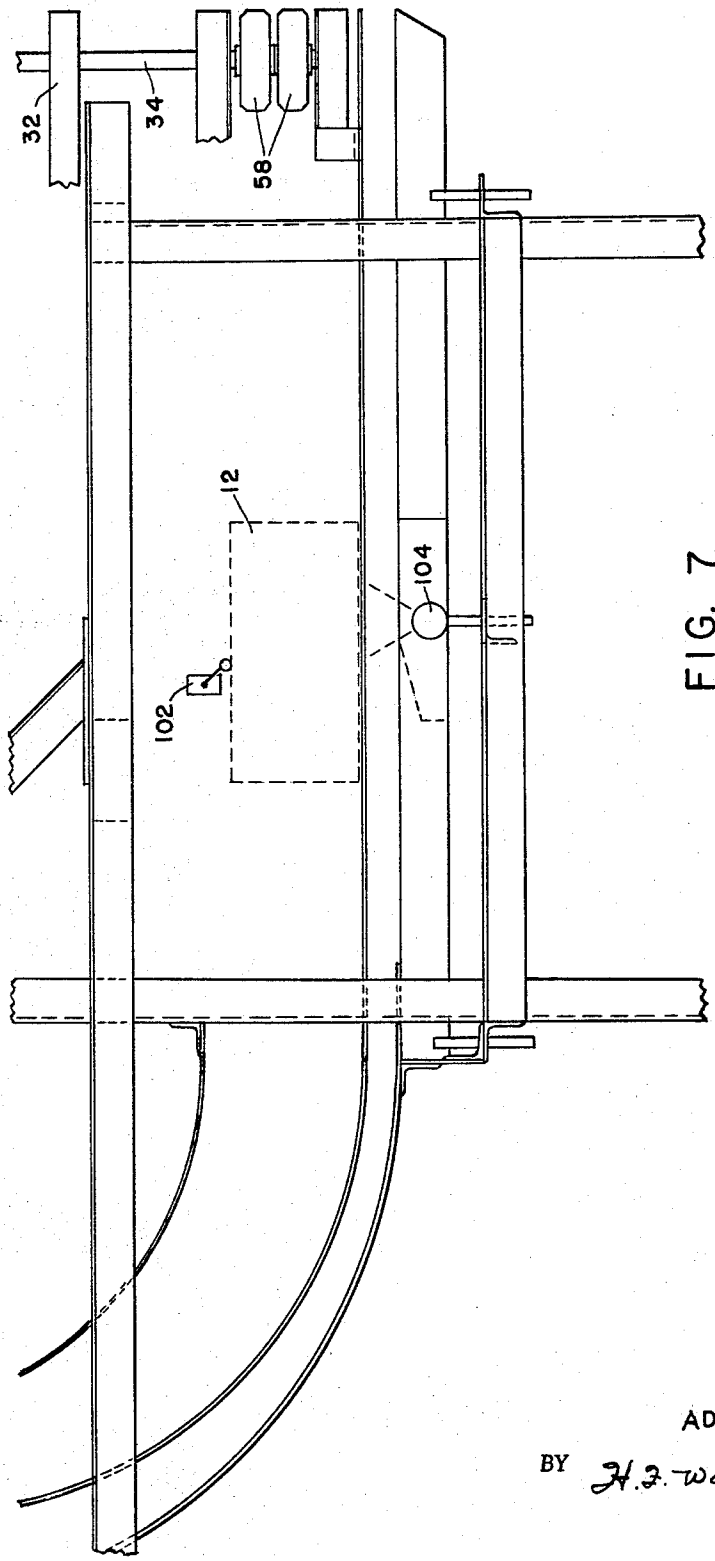


FIG. 7

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3,278,971

CASE CLEANING APPARATUS

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Filed July 13, 1964, Ser. No. 382,057
2 Claims. (Cl. 15—304)

This invention relates to a method and apparatus for cleaning containers such as bottle cases and more particularly relates to an apparatus for inverting bottle cases and similar articles and returning the same to original upright position so as to dislodge and dump any such dirt, dust, trash or other foreign matter out of the cases.

In bottling plants returnable cases of empty bottles are received at various times from consumer sources and the bottles are conventionally removed from the cases for cleaning and refilling. In the course of usage dirt, paper and refuse accumulate in and on beverage cases themselves and the cases have to be cleaned before being used again.

Attempts have previously been made to clean beverage cases in quantity but these have been unsuccessful in that much manual labor and excessive floor space are required in feeding the cases to a cleaning device in cleaning the cases and withdrawing the cases for subsequent use. While mechanical cleaning devices of various types have been proposed they are not very efficient and do not entirely eliminate manual handling operations. Moreover the mechanical cleaning devices of the prior art often did not clean the inside and provide means at the same time so that the refuse can be easily collected so as to prevent polluting of the air around the machine.

It is an object of the invention to provide a complete automatic machine for cleaning work objects such as beverage cases and the like in which manual labor is substantially entirely eliminated and not too much floor space occupied.

Another object of the present invention is to provide an improved apparatus of the character described for receiving from a conveyor and successively feeding cases to a slideway for inverting each successive case and means for contacting the sides of a case for movement while the cases are being cleaned and thereafter returning the cases to their original position.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which:

FIGURE 1 is a side elevational view of the apparatus of the present invention;

FIGURE 2 is an end view of the apparatus shown in FIGURE 1;

FIGURE 3 is a side view of the case vibrator;

FIGURE 4 is a view of detail of belt support member with parts broken away;

FIGURE 5 is a side view of the conveyor drive and support with part of conveyor belt broken away;

FIGURE 6 is a top view of one of the case conveyors;

FIGURE 7 is a side view of the apparatus showing a means for activating high velocity air control with parts broken away.

A clear conception of the construction of a beverage case cleaner embodying the present invention and of the mode of operating the same may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the several views. As shown there is a conventional type conveyor **10** which receives beverage cases **12** after the returned bottles have been removed for washing. The top **14** of the beverage case is in the open position while moving along conveyor **10**.

The case cleaning machine includes frame members **22**, **24**, **26** and **28** which support rail members **18** and **20**.

The beer case **12** is of the type which is fabricated from a heavy grade of paperboard material having a pair of hinged top flaps which meet at the center of the case when in closed position. In handling cases of this type the tops or flaps **12** may be opened by hand or the receiving line may be provided with means for opening the flaps such that they are advanced to the bottle removing machine. The cases approach the cleaning machine with the flaps spread outwardly as shown in FIGURES 1 and 2. As the cases are advanced to the cleaning machine they pass from the end of conveyor **10**. The cases after being discharged from the conveyor pass by gravity down the C-shaped slide formed by bars, rods or the like **18** and **20**. It is apparent that in passing through the C-shaped slide from its upper portion to its lower portion the case which before entering the slide was upright with its opening uppermost is turned through an angle of 180 degrees to the position shown in FIGURE 2 (lower case), with its opening downward. The cases continue out of the slide and are contacted on the sides by conveyor belts **36**. The conveyor belts **36** discharge the cases onto conveyor belt **42**. This conveyor belt **42** discharges the cases **12** to a lower conveyor and during the transfer from the conveyor **42** to the lower conveyor the cases **12** are again turned 180 degrees. The case is now cleaned and has the opening upwardly.

The rollers **64** are carried by arms **63**, shaft **66** to which is connected arm **68** shown in detail in FIGURE 4.

During the period which the cases **12** are being moved the cases are vibrated and high velocity air is projected into the interior of the cases to blow out any foreign material.

The vibrator support rail **78** has connected thereto vibrating plate **80** through the medium of coiled or suitable spring members **82**. To insure that the case **12** clears vibrating plate **80** a guard member **92** is hingedly attached at **96** to member **98**. Member **98** is attached to and depending downwardly from member **78**. The free end of member **92** is formed so as to be substantially parallel to vibrating plate **80**. The guard member **92** is also attached to member **78** by spring **100** which normally urges the guard **92** to the position shown in FIGURE 3. A spring **81** is connected to guard member **92** and to plate **80** so as to hold the guard member in the proper relationship to the vibrating plate **80**. High velocity air entering through pipe **90** causes ball-like member **88** to move within circular chamber **86** of members **84**. The member **84** is attached to vibrating plate **80** by any suitable means. The high velocity air moving ball **88** forces the plate **80** to be vibrated. The springs **82** tend to urge the plate upwardly and the high velocity air forces the plate downwardly and vibrates the plate **80**.

The cases passing between belts **32** are supported on spaced rods, bars or the like **60** and **62**. The spacing and arrangement of the bars **60** and **62** insures the removal of all foreign material to the collecting container **38**.

The conveyor belts **36** are driven by a pulley **58** spaced apart as shown in FIGURE 5 so that the V-shaped portion of the belt rides between the pulleys **58**. The pulleys **58** are driven through shaft **34** from a source, not shown. The outer end of shaft **34** is supported by member **32** suitably attached to the frame member **26**.

To hold the belts **36** in close contact with the cases rollers **64** carried by arms **63** force the belts toward the cases **12**. Arms **63** are pivotally mounted on shaft **66** and arm **68** being operatively connected to shaft **66** urge the rollers **64** to the position shown in FIGURE 6 under the influence of springs **70**. As the cases between the

belts **36** force the belts outwardly from the position shown in FIGURE 6 the belts would tend to become dislodged from the pulleys **58**. To overcome this tendency rollers **64** (similar to that shown in FIGURE 4) through arms **63** and **74** under the influence of spring **76** keeps the belts **36** securely on the pulleys **58**. The arms **63** and **74** are pivotally connected at **72** so that they act in unison.

When a case **12** reaches the vibrator the case comes into contact with a suitable switch **102** which acts to turn on the high velocity air which vibrates the bottom of the case and projects from blow pipe **104** into the interior of the case **12**. An exhaust fan **56** is connected to the collecting chamber **38** to eliminate dust around the machine. It is to be understood that an electrical vibrator may be used in place of air vibrator where quieter operation is required.

In operation the empty beer cases **12** with the tops open are delivered to the slide where they move by gravity until they are contacted by belts **36**. At this time the cases **12** are inverted, i.e. with the open tops downwardly. The high velocity air blowing into the interior of the case and the vibration against the bottom loosens any refuse and discharges it into receiver **38**. The inverted cases are received by conveyor generally indicated at **40** at which time the bottom of case can be inspected. The cases are discharged from conveyor belt **42** and slid down member **46**. An end of the case **12** strikes substantially horizontally extending member **50** which is of less width than the end of case **12**. The cases are properly guided by rail members **48** as they are deposited upon lower run of conveyor belt **42** with open top upwardly. The cleaned case is now ready for reuse.

What is claimed:

1. A container cleaning device comprising a substantially "C" shaped chute for receiving containers having opened tops and turning the containers about 180 degrees during the travel through the chute, spaced rod-like members at the discharge end of the said chute over which containers move, means on longitudinal sides of the rod-like members for moving a container thereacross, spring controlled means for holding the container moving means in close contact with the container being moved, spring actuated means for holding the moving means taut in

operating position, a vibrator contacting the container moving across the rod-like members, an air jet for discharging air into the container during vibration, a conveyor having a discharge end for receiving containers from the rod-like members, a second conveyor positioned below the discharge end of the first conveyor and a fixed shelf-like member in the fall space between the first conveyor and the second conveyor, containers striking the shelf-like members during the fall from the first conveyor whereby a container turns about 180 degrees.

2. A device for removing material from containers having an opened top comprising a substantially "C" shaped container chute for receiving a container and turning the container through 180 degrees to an upside down position, spaced members at the discharge end of the "C" shaped chute over which the container moves, container belt contacting means positioned along opposite sides of the spaced members, means biasing the belt against the container, the said container contacting belts moving the container over the spaced members, spring biased means holding the belts in a tightened position, a vibrator contacting the bottom of container for vibrating the container, air jets for discharging air into the open side of the container while being vibrated, a conveyor for receiving container from the spaced members, a second conveyor for receiving container from the first conveyor, the said second conveyor positioned in a plane lower than the first conveyor; and a container striking member positioned in a plane between the two conveyors whereby a container striking the container striking member is turned 180 degrees from the position of the container on the first conveyor.

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