United States Patent

Friedhelm

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[54] BOTTLE CLEANING MACHINE

[72] Inventor: **Thomas Friedhelm,** Bad Munster-Ebernburg, Germany

[73] Assignee: **Seitz-Werke G.m.b.H.,** Bad Kreuznach, Germany

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[58] **Field of Search** 134/72, 73, 104, 131

[56] **References Cited**

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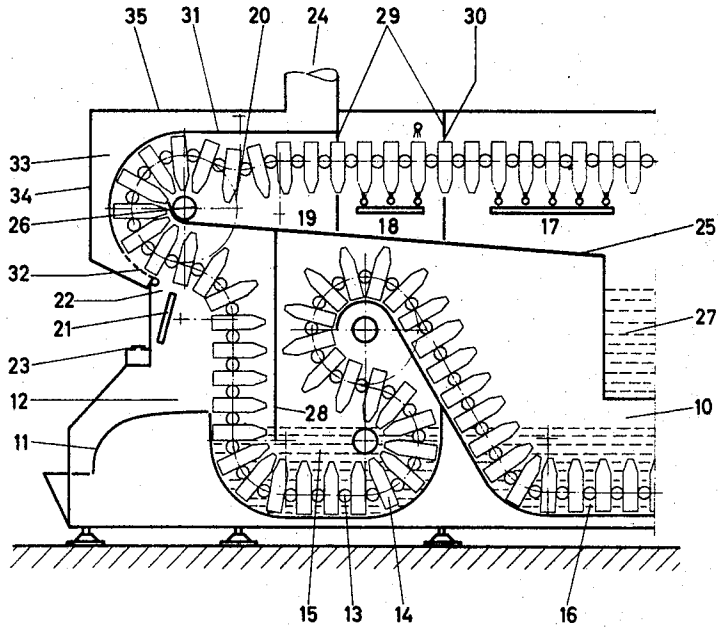
Primary Examiner—Robert L. Bleutge

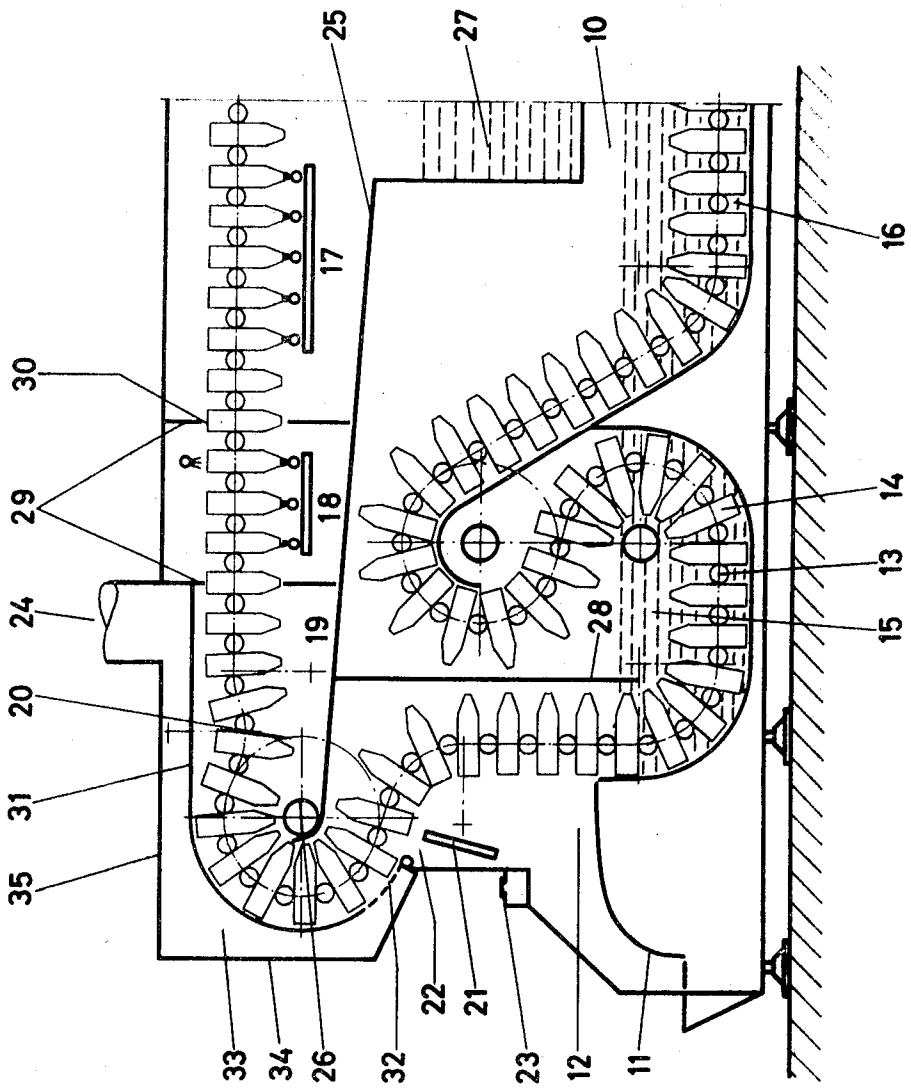
Attorney—Walter Becker

[57] **ABSTRACT**

A bottle cleaning machine, in which within the machine housing which comprises a plurality of spraying stations, the last spraying station is followed by a drip-off station from which a cover extends to the discharge station for the cleaned bottles, while said cover forms with the adjacent housing wall a passage through which steam clouds collecting in said passage are discharged.

5 Claims, 1 Drawing Figure





INVENTOR:
Friedhelm Thoma
By

BOTTLE CLEANING MACHINE

The present invention relates to a bottle cleaning machine with circulating bottle boxes and with a vapor cloud withdrawal in the upper portion of the housing within the region of the colder spray stations, especially of the drip-off station. The said circulating bottle boxes are passed through at least one softening bath and spray stations of different temperatures with adjacent drip-off station whereupon said bottle boxes are conveyed by a deviating device to a bottle dispensing station.

In cleaning machines with a plurality of treatment stations in the form of softening bath and spraying stations, naturally within the region of the bath and the hot spraying stations considerable steam or vapor clouds occur which escape toward the outside through bottle receiving and dispensing openings at one or both front sides of the machine. These clouds affect the operators of the machine and deposit as condensed water or spray water where the bottles are to be filled and stored. Particularly disadvantageous in this connection is the fact that the outwardly moving clouds deposit on the clean bottles which have already been dispensed in cooled-off condition and frequently reinfect the said bottles. Therefore, it is known in the upper portion of the housing of the machines to provide a cloud withdrawal from where by means of pipes connected thereto the clouds pass into the atmosphere. Frequently, the withdrawal pipes extend above the machine. It is also customary to provide withdrawal pipes which are connected to the cloud withdrawal system and extend downwardly and are arranged in or at the lateral machine walls for the removal of the clouds through the basement of the building into the atmosphere.

On the other hand, the cloud withdrawal system of the heretofore known type, which is employed for the bath as well as for the hot spraying stations, causes considerable heat losses. Moreover, the draft effect of such cloud withdrawal is relatively low and does not prevent clouds from escaping at the machine openings. Therefore, it has become known to separate the soft baths from the spray stations and the drip-off station by means of a mostly horizontal partition which extends below the path of the boxes and extends over the width of the machine. Furthermore, the soft baths are closed with regard to the machine openings, especially the discharge opening, by a mostly vertical machine wall. From this chamber defined by the walls, which chamber prevents the bath from losing greater quantities of heat, the clouds pass through the spray stations to the withdrawal device.

It has furthermore become known between the various spray stations of different temperatures and the drip-off station to provide one wall each which has a passage therethrough for the bottle boxes. The purpose of this feature consists in that each spray station can simultaneously be designed as sluice and a considerable quantity of the clouds originating with the soft bath and the hot treatment zones of the spray stations can be deposited in said sluice before said cloud passes into the withdrawal device, which for this reason within the region of the colder spray stations, in most instances, the drip-off station, is provided in the housing upper portion of the machine.

With bottle cleaning machines of this type, it has been found that the quantities of clouds which have to be withdrawn from the spray stations are considerable and the slight draft effect of the known withdrawing stations does, by no means, meet the requirements of modern conditions of operation.

It is, therefore, an object of the present invention to improve the cloud withdrawal from the spray stations of the above mentioned bottle cleaning machines by means of a cloud path which leads to the withdrawal device and forms a type of flue, said cloud path having a draft effect sufficient to remove the nondeposited quantities of clouds from the machine in a proper manner.

These and other objects and advantages of the invention will appear more clearly from the following specification in

connection with the accompanying drawing, which illustrates a multi-bath bottle cleaning machine having at one end the bottle receiving station as well as the bottle discharging station, said drawing therefore showing only the said one end.

The bottle cleaning machine according to the present invention is characterized primarily in that the drip-off station connected to the last spraying station is closed by a cover which extends above the path of the boxes in spaced relationship to the adjacent upper housing closure and is also closed by a cover which extends beyond the width of the machine and beyond the drip-off station while that end of the cover which protrudes beyond said drip-off station is provided with passage means and passed about the deviation while being connected to the machine housing in definitely spaced relationship to the deviation which is adjacent to the housing wall and is located above the bottle dispensing opening **22** on the machine housing.

The cover in the above mentioned design and arrangement thus brings about that the upwardly closed drip-off station and also the space which is formed between the cover and the housing walls and through passages of the cover communicates with the drip-off station, form a flue of great length which leads to the cloud withdrawal means and thereby creating a considerable draft effect. Advantageously, the cover is connected to the partition which separates the cold water spray station from the drip-off station. That portion of the partition which is located above the path of the boxes may, according to a further development of the invention, form a lateral confinement for the cloud withdrawal. A further employment of the above mentioned cover, and more specifically in the form of a sliding path for the bottles fed after effected deviation with the bottom downwardly toward the discharge opening, may, in conformity with the invention, also be effected by adapting to the radius of the deviation that end of the cover which extends around the deviation. The said end of the cover is located opposite said cover at a distance which will assure the support of the bottles.

Referring now to the drawing in detail showing broadly a multi-bath bottle cleaning machine, the bottles to be cleaned pass through the loading or filling station **11** and an adjacent machine opening **12** the bottle boxes **14** connected to endless transport chains **13** and pass through a pre-softening bath **15** and a main softening bath **16**. After deviation of the boxes **14** in the non-illustrated rear end of the machine, the bottles pass in the path of the box above the bath **15**, **16**, a plurality of spraying stations **17** and **18** of different temperatures and a drip-off station **19** of which, for the sake of simplicity, only the warm and cold water spray stations have been shown. After repeated deviation of the boxes **14** by a further rotating chain pair **20** which rotates within the region of the front wall **34** of machine housing **10**, the bottles with the bottom downwardly directed finally pass to the discharging station **21** which takes the bottles over from the there provided machine opening **22** and deposits the same onto a conveyor belt **23**.

Within the machine **10** which is provided with a cloud withdrawal **24** in the upper housing closure **35** above the drip-off station **19**, there is provided a partition **25** which extends substantially horizontally in the direction of the longitudinal axis of the machine. Below the upper box path, the said partition wall **25** extends over the entire machine width and separates the spray stations **17** and **18** and the drip-off station **19** from the conveyors **15**, **16**. One end of the wall **25** which simultaneously serves as collecting plate for the drip and spray liquid of stations **17**, **18**, **19** extends beyond the drip-off station **19** onto the region of the deviating wheels **20** and extends around shaft **26** thereof. The other end of wall **25** is with a slight drop preferably connected to a liquid container **27** or gradually merges with the latter. A further wall **28** which is adjacent to the bottle charging and discharging station **11**,**21** and is connected to the partition **25** shuts off the bath **15**, **16** in the direction of the machine opening **12**, **22**. Further vertical partitions **29** which extend from the upper housing closure **34** to the intermediate wall **25** are respectively arranged between

the individual spray stations **17,18** and the drip-off station **19** and are provided with passages **30** for the bottle boxes **14**. Expediently, that portion of the partition **29** which is located between the spray station **18** and the drip-off station **19** and is arranged above the path of the boxes forms a lateral confinement for the cloud withdrawal system **24**.

The top of the drip-off station **19** is covered up by a cover **31** which is connected to the partition **29** of the adjacent spray station **18**, said cover **31** extending above the box path. Beyond the station **19**, the free end of the cover **31**, which latter extends over the width of the machine, passes around the deviating pulleys **20**. The free end, which is provided with passages or perforations **32**, is connected to the machine housing **10** above the discharge opening **22**. In this arrangement in which the straight portion and the curved end of the cover **31** are located opposite the respective adjacent housing wall **34,35** in spaced relationship thereto, the drip-off station **19** and the intermediate space **33** which is formed between the confinements in conformity with said spaced relationship, form a chimney leading to the flue **24**. Through said chimney, those clouds will pass to the flue **24** which originated with the spray stations **17,18** and have not previously been deposited within the colder treatment stations forming sluices or gates, especially the cold and fresh water spray stations. Advantageously, the curvature of cover **31**, especially within the range of the passages **32** are adapted to the circumference of the deviating wheels **20** and are arranged in spaced relationship thereto. In this way, the cover **31** will, after effected deviation of the boxes **14**, simultaneously form the sliding plate for supporting the bottles on which said bottles with the bottom thereof kept downwardly pass to the discharge station **22**.

It is, of course, to be understood that the present invention is, by no means, limited to the particular construction shown in the drawing but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A bottle cleaning machine which includes: housing means comprising a bottle cleaning path, endless movable conveyor means arranged within said housing means for receiving bottles to be cleaned and moving the same along the said path, a plurality of successive spraying stations having spray means therein arranged along said path, a drip-off station following the last one of said spraying stations when considering the direction of movement of said conveyor means, a charging station for loading bottles to be cleaned onto said conveyor means, a discharge station for discharging cleaned bottles from said conveyor means, said discharge station being arranged in spaced relationship to said drip-off station and following the latter when considering the direction of movement of said conveyor means, direction changing means for changing the direction of movement of said conveyor means, said direction changing means being arranged between said drip-off station and said discharge station, cover means arranged within said housing means and extending from said drip-off station to said discharge station around said direction changing means while being provided with perforations, said cover means being spaced from the respective adjacent wall portion of said housing means and forming therewith a passage for vapor clouds developing along said path, and flue means provided in said housing means and communicating with said passage means for discharging vapor clouds from said passage means.

2. A bottle cleaning machine according to claim **1**, which includes partition means separating said drip-off station from the preceding spraying station, and in which said cover means is connected to said partition means.

3. A bottle cleaning machine according to claim **2**, in which a portion of said partition means forms a part of said flue means.

4. A bottle cleaning machine according to claim **1**, in which that end of said cover means which is adjacent said discharge station forms supporting means for supporting cleaned bottles conveyed to said discharge station.

5. A bottle cleaning machine according to claim **1**, in which said direction changing means is formed by sprocket wheel means, and in which that end of said cover means which is adjacent said discharge station has a curved end portion corresponding in curvature to the curvature of said sprocket wheel means.

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