J. E. JOHNSON AND C. H. OSLUND.

BOTTLE TESTING MACHINE.

APPLICATION FILED FEB. 24, 1920.

1,433,284.

Patented Oct. 24, 1922.

2 SHEETS—SHEET 1.

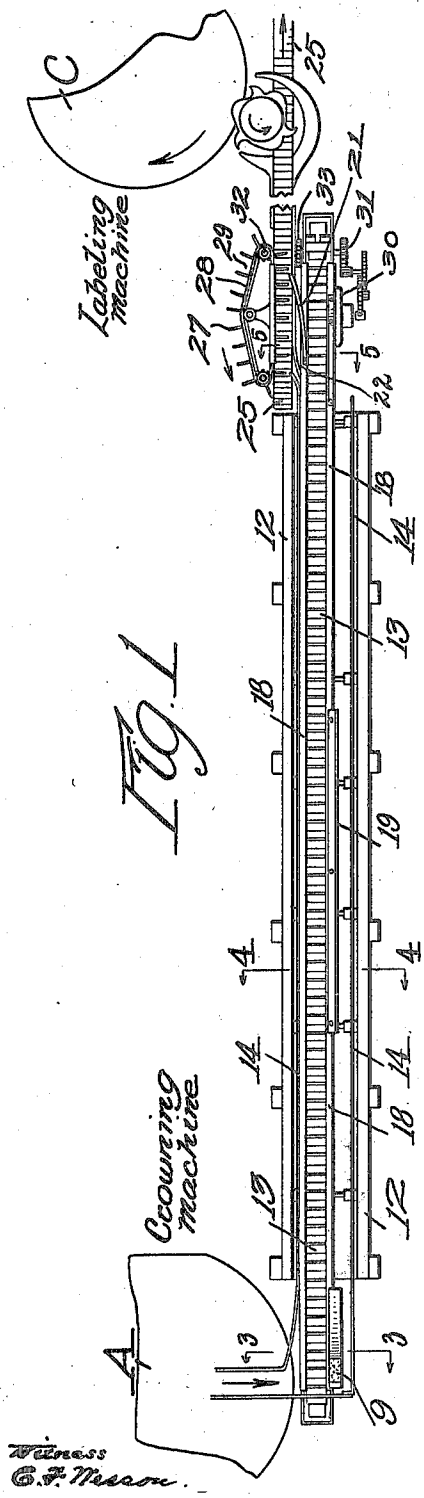


Fig. 1

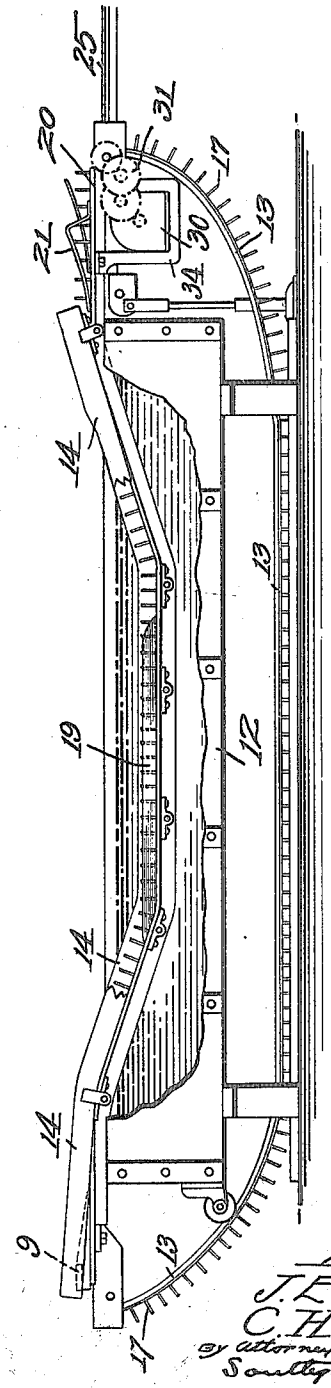


Fig. 2

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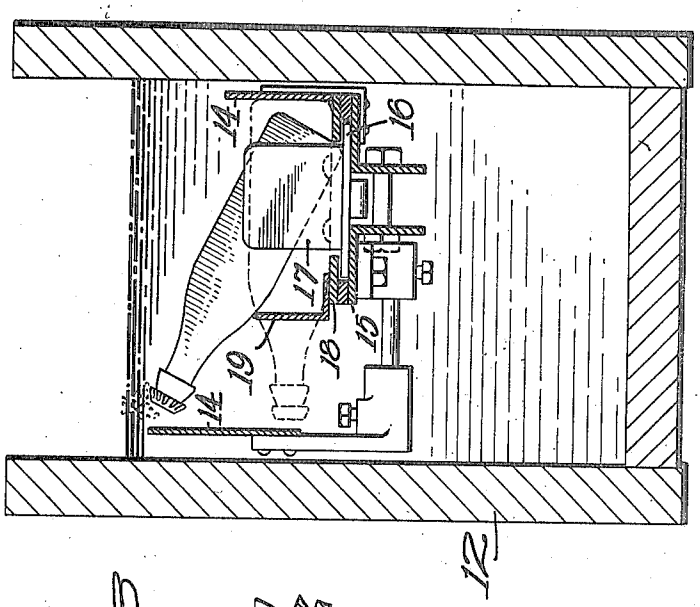


Fig. 4.

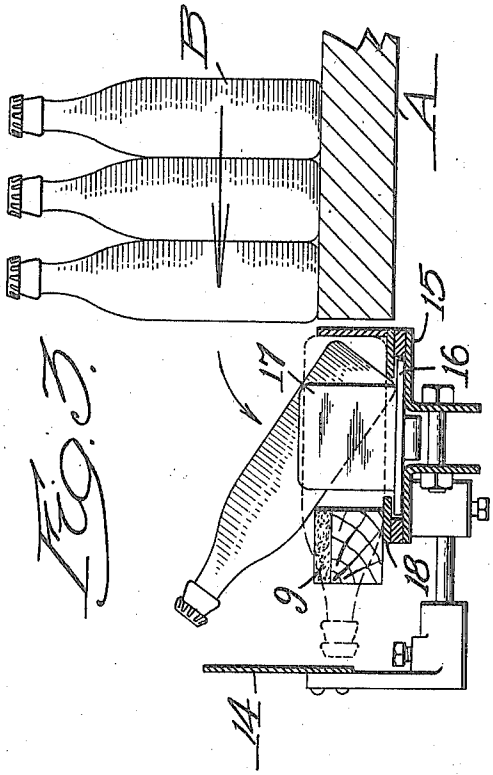


Fig. 3.

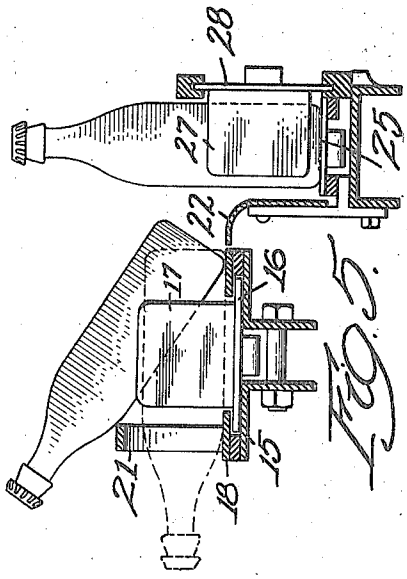


Fig. 5.

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Patented Oct. 24, 1922. 1,433,284

UNITED STATES PATENT OFFICE.

JOHN EMANUEL JOHNSON AND CHARLES H. OSLUND, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO THE O & J MACHINE COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

BOTTLE-TESTING MACHINE.

Application filed February 24, 1920. Serial No. 360,942.

To all whom it may concern:

Be it known that we, JOHN EMANUEL JOHNSON and CHARLES H. OSLUND, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Bottle-Testing Machine, of which the following is a specification.

This invention relates to a machine for testing capped or sealed bottles or other receptacles to show any imperfection in sealing, and at the same time agitating the bottle so as to mix the contents which usually comprise a thin and a thick liquid.

The principal objects of the invention are to provide for effectively securing these two advantages while the bottles are passing from a crowning or capping machine, or other machine in which they are closed, to some other machine, as for example, a labeling machine, and to accomplish this in a simple and accurate manner.

Reference is to be had to the accompanying drawings in which—

Fig. 1 is a plan of a machine constructed in accordance with this invention;

Fig. 2 is a side elevation of the same with the tank shown in section;

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1; and Fig. 5 is a similar view on the line 5—5.

We have shown the invention as comprising a testing tank 12 receiving bottles B from a crowning machine A which passes them out on a conveyor 13 in a horizontal position and at an elevation above the water in the tank 12 in which the conveyor 13 runs.

It will be noted that the bottles in falling from the crowner platform to the conveyor land in inclined position on a rubber buffer 9 and are jarred sufficiently to assist in mixing their contents. They are taken along by the conveyor in a direction at right angles to their line of motion on the crowner platform. They remain in inclined position for a short distance and then this conveyor passes down on the guides 15, which support it. This brings the bottles into horizontal position and down below the level of the water. The sides of the tank enclose guides 14 to engage the ends of the bottles and keep them in proper position on the conveyor. This conveyor is made up of links 16 pivotally connected together and each having a plate 17 extending from it at right angles. These plates are spaced apart far enough to admit bottles between them. The flat parts of the link 16 run under a pair of stationary supports 18 on which the bottles roll as they travel along with the conveyor. This is for mixing purposes. While the bottles are immersed in the water in this way they encounter a longitudinal guide 19 at the side farthest from the crowner, that is the side over which project the necks of the bottles. This guide is secured along the inside of the tank by brackets located on the sides thereof and supports the necks above the butts so as to incline the bottles under water. If there is any defect in the crowning sufficient to admit much air or gas, this is indicated by the appearance of bubbles in the water, and the attendant removes the defective bottles. The inclination of the bottles while under water causes the air caught therein to rise to the neck of the bottle and escape under water if the sealing is not perfect, fully showing the defect and permitting of the removal. The fact that the bottles are rolling along makes this still more perfect.

The bottles are brought back to horizontal position with some degree of jarring and with a further mixing of their contents, when they reach the end of the guide 19 the top of which is horizontal. This guide extends horizontally from the incline down into the tank at the receiving end nearly to the incline at the discharge end. The conveyor passes up the latter incline and brings the bottles up out of the water, their testing having been completed at this time.

When the bottles arrive on the top of an end table 20 they are carried along a short distance horizontally and then encounter an inclined guide 21 over the conveyor shown as carried by one of the guides 15 which raises them up slightly at the crowned end. Just then they pass over a curved plate 22 which is supported by a part of the stationary side walls of the tank and therefore they slide down over this surface into an upright position which further jars them and mixes their contents.

The bottles can be carried off from this point in any desired way, but we have shown

a discharging conveyor 25 which preferably is a part of the labeling machine C, and therefore delivers the bottles to that machine. This conveyor comprises the usual conveying belt, the construction of which is not described in detail as it forms no part of this invention, but it also involves a short endless carrier 28 traveling over the conveyor 25. This carrier 28 is made of links having plates 27 forming recesses 29 between them, each large enough to receive a bottle. These recesses provide surfaces against which the bottles strike as they descend from the first conveyor, and also constitute means for bringing the bottles again into an upright position ready to be carried along on the conveyor 25 into position to be labeled.

A motor 30 is shown for operating the conveyor 13 through gearing 31. It also operates the carrier 28 at the same speed through a shaft 32 and gearing 33. All these elements are shown as supported by an extension 34 on the end of the tank 12.

The operation of the machine has practically been described already, but it may be stated in general that the bottles come from the crowner in vertical position and they are dumped off the end of this support on the conveyor on which they land in inclined position, thus jarring the bottles and mixing their contents. They then pass down under water and travel along in it for a distance with a rolling motion, meantime being inclined so that their necks are at the top to facilitate discharge of any air caught in them in the process of crowning. They are tested by the operator observing any bubbles that arise in the tank. The defectively sealed bottles are removed by hand. The remainder of the bottles, thoroughly tested, are agitated further as they roll along with the conveyor and are given a final agitation when they are discharged on their ends in the labeling machine conveyor.

Although we have illustrated and described a single embodiment of the invention and shown it as connected with a crowning and labeling machine we are aware of the fact that modifications can be made in the construction and relative arrangement of the parts, and that the invention can be used in connection with other machines without departing from the scope of the invention as expressed in the claims. Therefore we do not wish to be limited to these features and combinations, but what we do claim is:—

1. In a testing machine, the combination of a tank for holding water, and means for receiving bottles, immersing them in water, rolling them along therein, and inclining them while in the water to a position with their necks up to facilitate the discharge of any air in the bottles under water.

2. In a bottle testing machine, the combination of a tank for holding water, a conveyor movable in said tank and having means for receiving bottles, rolling them along and immersing them in water, means for inclining them while in the water to facilitate the discharge of any air in the bottles, and means for agitating the bottles while they are traveling on the conveyor.

3. In a testing machine, the combination of a tank for holding water, a conveyor movable in said tank and constituting means for immersing receptacles or bottles in water, and means for raising the sealed ends of the receptacles while in the water to facilitate the discharge of any air.

4. In a bottle testing machine, the combination of a tank for holding water, a conveyor movable in said tank and having means for receiving bottles, and immersing them in water, and means for inclining them while in the water to facilitate the discharge of any air in the bottles, the last named means comprising a construction in the path of the conveyor for raising one end of each bottle without raising the other end.

5. In a conveying device for cylindrical receptacles, the combination of a tank for holding water, a conveyor movable in said tank under water, and means whereby the conveyor causes the receptacles to roll along for agitating the contents while they are traveling on the conveyor under water.

6. In a machine of the character described, the combination of an endless conveyor having means for engaging cylindrical receptacles located on the conveyor and pushing them along, and a pair of stationary supports located at the sides of the conveyor for supporting the two ends of the cylindrical receptacles on the conveyor, whereby the said receptacles will be rolled along as the conveyor travels for the purpose of mixing their contents.

7. In a machine of the character described, the combination with a water tank, of a conveyor located therein and having means for engaging cylindrical receptacles located on the conveyor and pushing them along, a pair of stationary supports located at the sides of the conveyor for supporting the two ends of the cylindrical receptaces on the conveyor, whereby the said receptacles will be rolled along as the conveyor travels for the purpose of mixing their contents, and means whereby the conveyor is guided to move the receptacles down below the surface of the water and then up again above it after they have passed through the water with a rolling motion.

8. In a machine of the character described, the combination with a water tank, of a conveyor located therein and having plates for engaging cylindrical receptacles located on the conveyor and pushing them along, a pair of stationary supports located at the sides of the conveyor for supporting the two

ends of the cylindrical receptacles on the conveyor, whereby the said receptacles will be rolled along as the conveyor travels, and stationary means located under the water for supporting the sealed ends of the receptacles at an elevation above the opposite ends to facilitate the escape of any air or gas from imperfectly sealed receptacles under water.

9. In a bottle testing machine, the combination of a tank for holding water, a conveyor movable in said tank and having means for receiving bottles, and immersing them in water, means for inclining them while in the water to facilitate the discharge of any air or gas in the bottles under water, and means for delivering the bottles located in position to discharge the bottles from itself in a vertical position to a horizontal position on the conveyor for the purpose of agitating the contents of the bottles.

10. In a bottle testing machine the combination of a tank for holding water, a conveyor movable in said tank and having means for receiving bottles, and immersing them in water, means for inclining them while in the water to facilitate the discharge of any air or gas in the bottles under water, and a conveyor for receiving the bottles from the first named conveyor so associated with it as to agitate the contents of the bottles as they are discharged from the first conveyor and received by the last one.

11. The combination with means for receiving receptacles in vertical position from a crowner or sealer and carrying them away from it, of a conveyor located in position to receive the receptacles from said means, said conveyor receiving the receptacles in horizontal position and being movable at right angles to the first direction of travel of the receptacle, a second conveyor located at the end of the first conveyor, and means between the first and second conveyors for causing the receptacles to be deposited from the first conveyor in horizontal position to the second conveyor in vertical position.

12. The combination with a support for receiving receptacles in vertical position, of a conveyor located in position to receive the receptacles from the support, the receiving end of said conveyor being located in horizontal position and receiving the receptacles in horizontal position, a second conveyor located at the end of the first conveyor in horizontal position and parallel thereto but at a lower level, and means between the first and second conveyors for causing the receptacles to be deposited from the first conveyor in horizontal position to the second conveyor in vertical position, the second conveyor being located at the side of the first conveyor as said support, whereby the receptacles will be deposited thereon on the same end on which they rest on the support.

13. The combination of a chain conveyor receiving receptacles in horizontal position, a discharging conveyor located at the end of the conveyor in horizontal position and parallel thereto but at a lower level, means between the conveyors for causing the receptacles to be deposited from one in horizontal position on the other in vertical position, and an endless chain located in vertical position and having normally projecting plates passing over the receiving strand of the discharging conveyor for limiting the motion of the receptacles when they pass to that conveyor and keeping them in position thereon.

14. The combination with a conveyor located in position to receive receptacles in horizontal position, a discharging conveyor located at the side of the end of said conveyor in horizontal position and parallel thereto but at a lower level, means between the conveyors for causing the receptacles to be deposited from the first named conveyor in horizontal position to the last conveyor in vertical position, and a labeling machine to which the last conveyor delivers the receptacles.

In testimony whereof we have hereunto affixed our signatures.

JOHN EMANUEL JOHNSON.
CHARLES H. OSLUND.