June 11, 1935. W. L. McNAMARA ET AL 2,004,492

VESSEL HANDLING AND FINISHING DEVICE

Filed June 5, 1929 4 Sheets-Sheet 1

Fig. 1.

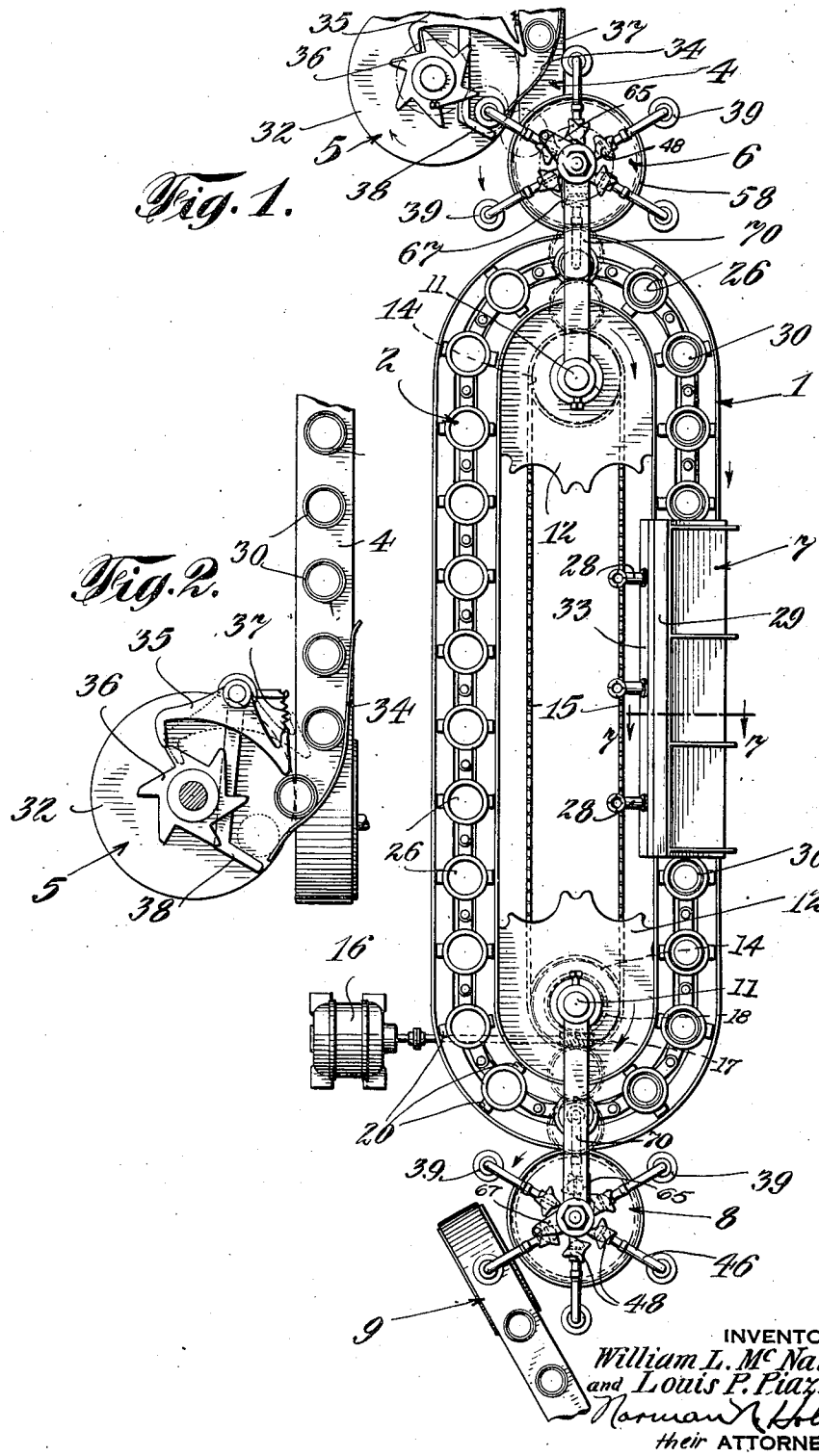


Fig. 2.

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Filed June 5, 1929 4 Sheets-Sheet 2

Fig. 3.

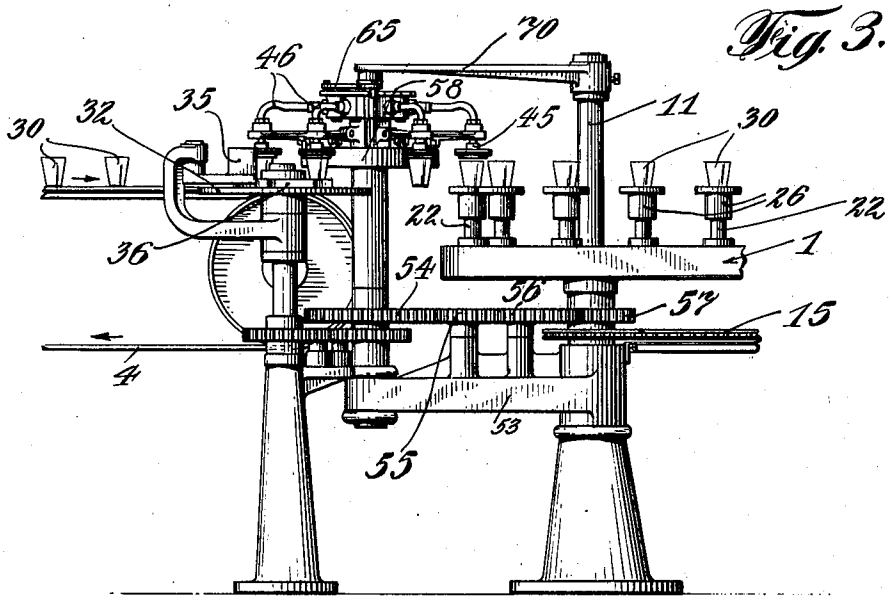


Fig. 7.

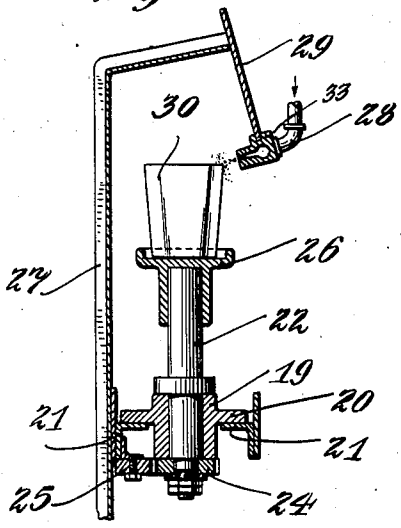
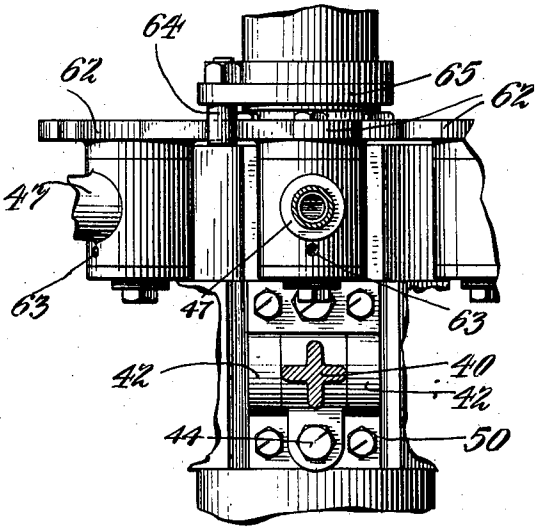


Fig. 6.



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VESSEL HANDLING AND FINISHING DEVICE

Filed June 5, 1929 4 Sheets-Sheet 3

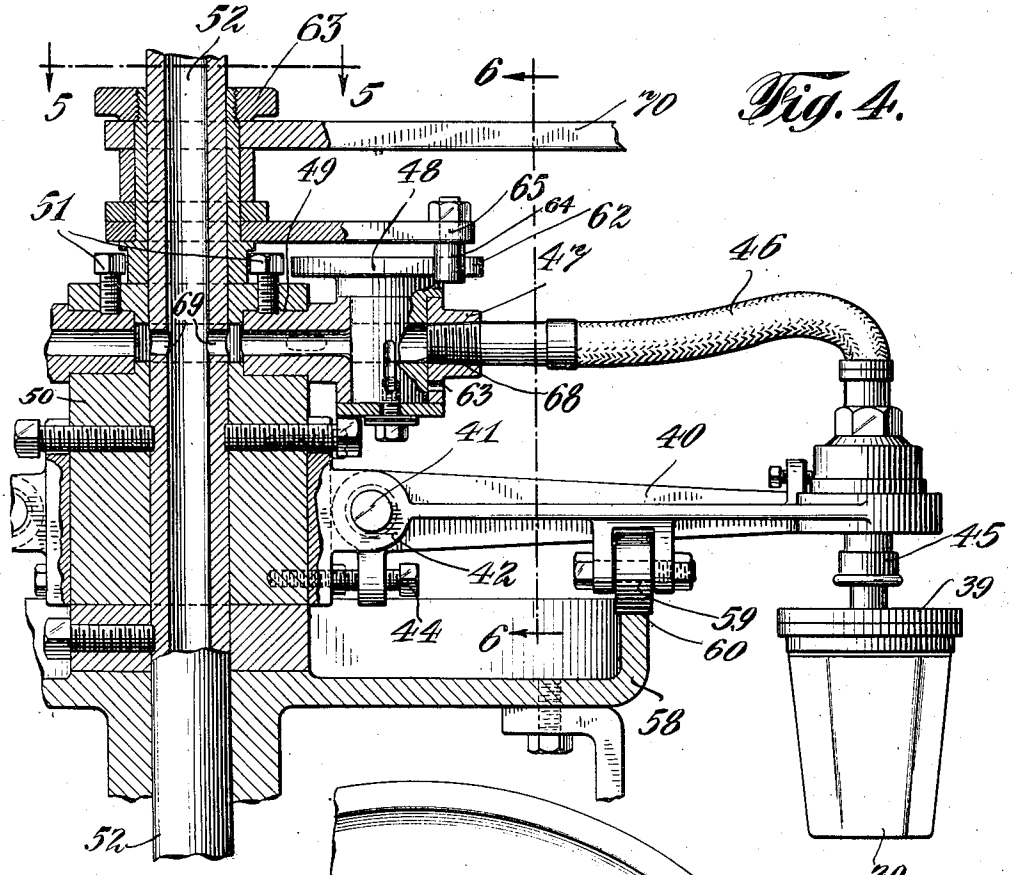


Fig. 4.

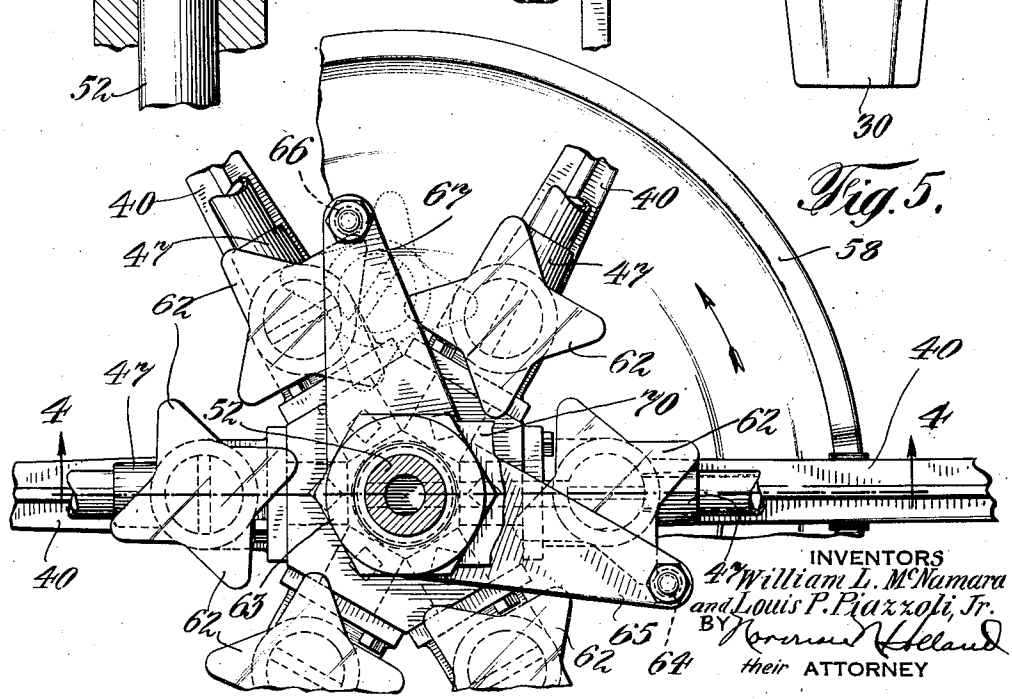


Fig. 5.

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VESSEL HANDLING AND FINISHING DEVICE

Filed June 5, 1929 4 Sheets-Sheet 4

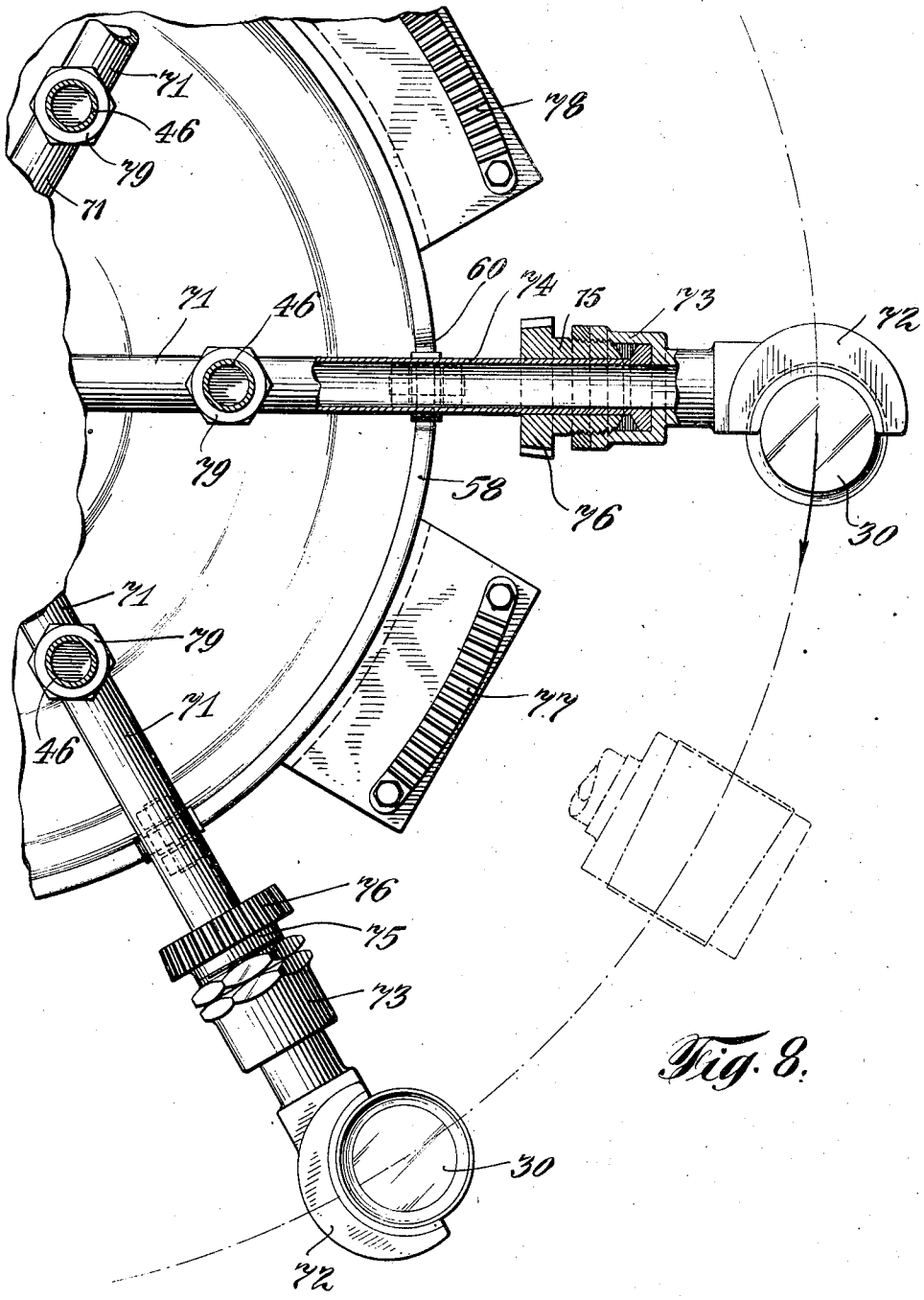


Fig. 8.

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Patented June 11, 1935

2,004,492

UNITED STATES PATENT OFFICE

2,004,492

VESSEL HANDLING AND FINISHING DEVICE

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Application June 5, 1929, Serial No. 368,620

28 Claims. (Cl. 198—22)

The present invention relates to glass machinery and more particularly to a machine for glazing or fire polishing glassware.

In the manufacture of certain types of glassware, particularly tumblers, it is desirable to glaze or fire polish the upper edges of the ware to eliminate fins and other irregularities. This is generally done by playing a flame on the edge of the receptacle to melt or soften this portion of the ware and thereby make it smooth. Boys are employed to take the individual containers and place them on conveyors forming part of the machines for subjecting the glassware to heat. Such heat cannot be applied to containers moving along the usual conveyor because the flame would be applied unevenly. The present glazing machines rotate the tumblers while passing through the heating flame. A large amount of labor is required for placing each individual tumbler on and for removing it from the glazing machine. This increases the cost of this class of ware and slows up the rate or production.

The present invention aims to overcome these difficulties by minimizing the amount of labor required and by eliminating the necessity for interrupting the usual line of movement of containers from the glass forming machine to the annealing leers. It will be understood that many of its features are applicable to transferring mechanisms generally, the present application being for illustrative purposes.

An object of the invention is to facilitate the manufacture of glassware, particularly glazed glassware.

Another object of the invention is to provide a simple and effective mechanism, automatic in its operation, for glazing or fire polishing glassware.

Another object of the invention is to minimize the time and labor required for glazing or finishing glass containers, thereby to reduce the cost and to increase the production thereof.

Another object of the invention is to automatically remove containers from a conveyor to a fire polishing machine and to automatically return the containers to the conveyor so that the movement of the ware from the forming machines to the annealing leers is not materially interrupted.

Another object of the invention is to provide an improved vessel transfer mechanism for engaging vessels in one position and delivering them at another position.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein

Fig. 1 is a top plan view illustrating the movement of the vessels through the machine;

Fig. 2 is a detailed top plan view of the front end of the machine showing the mechanism adapted to receive the tumblers from a conveyor;

Fig. 3 is a side elevational view, taken at one end of the machine, illustrating the movement of the vessels onto a fire polishing machine;

Fig. 4 is a detailed sectional view of a portion of the vessel transferring mechanism;

Fig. 5 is a detailed view taken on the line 5—5 of Fig. 4;

Fig. 6 is a detailed view taken along the line 6—6 of Fig. 4;

Fig. 7 is a detailed sectional view taken on the line 7—7 of Fig. 1; and

Fig. 8 is a detailed view illustrating a transferring mechanism adapted to invert the containers during the transferring operation.

Referring to the drawings, there is shown (Fig. 1) a machine 1 adapted to glaze containers delivered to it. At one end of the machine there is a conveyor 4 adapted to deliver containers to a positioning device 5 from which they are removed by a transferring mechanism 6 and positioned on the conveyor 2 of the glazing machine where the containers pass through a tunnel 7 in which the rims are heated to eliminate fins and other irregularities. The conveyor continues to the other end of the machine and the vessels are removed by the transfer mechanism 8 and delivered to a conveyor 9 which may lead to a suitable annealing leer.

The glazing machine 1 may be of any suitable form, but preferably comprises a pair of supports 11 at the respective ends thereof, having mounted thereon sprockets 12 adapted to mesh with and drive the conveyor 2. The sprockets 12 may be driven in any suitable manner but are preferably rigidly connected to the shafts 11 which may be interconnected by means of sprocket wheels 14 and chain 15. One of the shafts 11 is operatively connected to the driving shaft of the motor 16 by means of the worm gears 17 and 18.

The details of the preferred form of the con-

veyor 2 and of the heating tunnel are shown in Fig. 7. A series of bearings 19 are connected together with flanges 20 riding upon angle irons 21 attached to the framework of the machine. In each of the bearings 19 there is a pin or shaft 22 having a gear 24 in operative engagement with a rack 25 on the side of the framework of the machine. The upper end of the shaft 22 has a seat 26 for glassware such as tumblers. A suitable shield 27 is mounted along one side of the conveyor for a part of its travel and may be covered with asbestos or other heat insulating material. A burner 29 is mounted on the other side of the conveyor by means of a bracket 29 attached to the shield 27. The burner may comprise an elongated tube 33, having apertures in the side adapted to subject the glassware to a substantially continuous flame.

It will be noted that, as the vessels 30 move through the tunnel formed by the shield 27, the shaft 22 is rotated by means of the gear 24 and rack 25 to rotate the tumblers 30 thereby causing the flames from the apertures in the burner 28, which are formed closely adjacent to each other, to play continuously on the rims of the containers to apply heat uniformly thereto and to melt any fins or other irregularities thereon.

At one end of the machine 1 there is shown a conveyor 4 (Fig. 2) delivering vessels to a rotating disc 32. A guide 34 co-operates with an oscillatory member 35 actuated by a cam 36 to deliver receptacles in timed relation to the movement of the transfer mechanism 6. As shown herein, the cam 36 has a series of dwells and rotates with the disc 32, the pivoted member 35 being moved by the cam in opposition to a spring 37. Whenever the oscillatory member is moved in opposition to the spring, sufficient space is afforded between the guide and one end of the oscillatory member to permit a container to move therebetween. Immediately thereafter, the oscillatory member drops into the dwell of the cam and holds back any approaching container. The delivered container engages a stationary member 38 which positions it on the rotating disc for engagement by one of the vacuum heads 39 on the vessel transfer mechanism.

The transfer mechanism for engaging the vessels and placing them upon the conveyor 2 of the glazing machine is shown more particularly in Figs. 3 to 6 of the drawings. Preferably, the mechanism comprises a plurality of radially extending arms 40, shown herein as 6 in number, pivoted at their inner ends by means of pins 41 and bearings 42 with adjustment screws 44 adapted to limit the downward movement of the vessel engaging heads 39 mounted at the extreme ends of the arms 40. Extending upwardly from the heads 39 are stems 45 suitably mounted in the ends of the arms 40 and operatively connected with conduits 46 threaded into the apertures 47 of valves 48. The valves are secured in the apertures 49 of the rotary member 50 by means of bolts 51. The entire mechanism, including the arms 40, vacuum heads 39, conduits 46 and valves 48, is attached to and rotated with the rotary member 50 which is rigidly attached to a vertical shaft 52 and operatively connected to the driving mechanism through gears 54, 55, 56 and 57. The shaft 52 and its associated transferring mechanism are mounted upon a bracket or extension 53 on the base of shaft 11.

A stationary cam 58 is adapted to support the arms 40 through the intermediation of the cam rollers 59. At the point of engagement of the head 39 with containers, there is a dwell 60 in the cam 58 and a similar dwell at the point where the containers are delivered to the conveyor 2 of the glazing machine.

Each of the valves 48 has a member 62 which is adapted, when moved one quarter of a revolution, to open or close the valve and, when moved another quarter, to close or open the valve, depending upon its previous position. These members 62 are each adapted to engage a pin 64 secured to a stationary arm 65 and also to engage a pin 66 secured to a stationary arm 67. The pin 64 in the arm 65 is adapted to open each valve as they pass so that the suction heads 39 are subjected to a vacuum for engaging and raising containers and the pin in the arm 67 is adapted to rotate the valve members 62 to positions where the vacuum lines are successively opened to atmosphere through apertures 63 registering with slots 68. It will be noted that the common vacuum line 52 extending through the vertical shaft is in operative relation with the several valves by means of apertures 69. The valves 48 are effective to subject the conduits 46 alternately to vacuum and to the external atmosphere so that the vessels may be engaged and released at proper points in the movements of the arms. The position of the arms 65 and 67, or either of them, may be changed as desired by loosening the nut 63 (Figs. 4 and 5), adjusting the position of the arms and thereafter tightening the nut 63 to hold the arms in their adjusted position. In this manner, the point at which the vacuum becomes effective or ineffective on the suction heads may be changed. The adjustability of the arms 65 and 67 is advantageous at the time the machine is set up for a particular job and also for obtaining the best operating results. A lateral extension 70 is connected across the upper ends of the vertical member 11 and the vertical shaft 52 in order to make the construction more rigid.

A transferring mechanism 8, similar to the one described above, is provided at the other end of the glazing machine. In order to avoid duplicating descriptive matter, the various parts of the transfer mechanism at the delivery end are properly numbered so that the construction and operation will be readily understood from the description of the transfer mechanism at the intake end of the machine.

At the delivery end of the machine the containers are delivered by the conveyor 2 to the glazing machine in proper position and it is, therefore, unnecessary to have at this point a mechanism for positioning the various receptacles. The arms 40 and vacuum heads 39 operate in a similar manner, as described above, to engage receptacles delivered by the conveyor 2, raise them slightly to clear the glazing machine, transfer them to a position above the conveyor 9, and drop the containers slightly to engage the conveyor which moves them onward toward a leer. It will be noted that the conveyor 9 moves in the direction of the rotation of the transfer mechanism and this, of course, facilitates the placing of the vessels on the conveyor.

In certain instances, it is desirable that the tumblers be delivered from the forming machines to the conveyors in inverted position, that is, with the bottoms upward. The reason for this is that there is less likelihood of the tumblers toppling over in their movements. In Fig. 8 of the drawings, there is shown a modification of the structure described herein, which is adapted to invert

the containers during the transfer from a conveyor to the glazing machine. This construction may be substantially similar to that described above, with arms 71 corresponding to the arms 40 resting upon the cam 58 with the outer end of the frames having heads 72 adapted to engage the sides of the inverted tumblers. The arm 71 may comprise a sleeve 73 adapted to be telescoped about a hollow member 74 and held in position thereon by means of another sleeve 75. In this manner, the head 72 is rotated upon the member 74. The gear 76 is adapted to mesh with a rack 77 during the travel after engagement with the receptacle to the delivery thereof to invert the head and the receptacle held thereby. In this manner, the receptacle is delivered to the conveyor 2 in upright position although received by the head 72 in inverted position. A similar rack 78 may be positioned to engage the gear 76 and return the head 72 to its normal position prior to its engagement with a vessel. For convenience, the member 74 may have a conduit 79 extending therethrough and the vacuum tubes 46 may be connected directly to the arms 71 for rendering the vacuum effective upon the heads 72 through the conduits. It will be understood that the dwells in the cam, similar to those described hereinbefore, are adapted to lower and raise the heads 72 sufficiently to clear the conveyor from which the containers are removed and upon which the containers are deposited.

In the operation of the device, the vessels are delivered by a conveyor which may lead directly from the usual glass forming machine where vessels are delivered at the rate of some twenty or thirty a minute. These vessels reach the disc 5 where they are delivered one at a time by means of the oscillatory member 35 and the guide 34 operated by the cam 36. The vessels delivered to the disc 32 are positioned by means of the stationary member 38 directly under one of the heads 39 on the vessel transferring mechanism. By means of the dwell in the cam 58, the head 39 is dropped slightly to engage the containers which immediately rise after the vacuum has been made effective on the head by the valve member 62 engaging a pin 64. The engaged vessel, being raised clear of the conveyor, is rotated around with the arms 40 and rotary device 50 until positioned over one of the seats 26 of the conveyor 2 whereupon a suitable dwell in the cam 58 drops the arm 40 and suction head 39 slightly so that the tumbler rests upon the seat 26. At the same time, the valve member 62 engages the pin 65 to open the conduit 46 to atmosphere and permit the container to drop in place on the conveyor 2. The containers are then moved by means of the conveyor 2 through the tunnel 7 where the burner, which comprises essentially a series of small openings along the side of the pipe 33, plays a flame continuously on one side of the tumblers throughout the movement through the tunnel. The tumblers, in order to give a very even heating effect, are rotated by means of the rack 25 effective upon gears 24 and shafts 22. The tumblers emerge from the tunnel and travel along the conveyor a short space so that the upper edges cool slightly and are then engaged by a transfer mechanism at the delivery end having heads 39 which register with each of the seats 26 and remove the containers therefrom and deliver them to the conveyor 9, as described hereinbefore with reference to the transfer mechanism 6.

In the construction shown in Fig. 8 of the drawings the vacuum heads 72 are shown for engagement with the sides of the containers. The heads engage the containers and are then rotated upon the arms 71 through 180 degrees by means of the gears 76 and rack 77. Thereafter, the containers are delivered in upright position to the conveyor 2 of the glazing machine. It will be understood that a similar mechanism can be used at the delivery end of the glazing machine for returning the ware to the conveyor 9 in inverted position.

It will be seen that the present invention provides a mechanism adapted to be placed in any desired position about a glass factory and connected by means of conveyors to a suitable glass machine and to a suitable leer. The ware, on its way to the leer, is glazed automatically without interfering with its progress. The mechanism is automatic in its operation and eliminates the hand operations heretofore necessary in this class of work, thereby reducing the cost of the articles. By reason of the vacuum operated heads, there is no chance of the vessels being deformed in any manner and the original exact shape is preserved. This is quite important due to the fact that many of the containers are used for packers' ware where sealing machines seal closures to the upper rims of the receptacles and exact finishes are essential. The machine is simple in construction and fully capable of withstanding the rough usage to which it may be subjected.

As various changes may be made in the form, construction and arrangement of the parts in the above embodiment without departing from the spirit of the invention, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim:

1. In a vessel transferring device of the class described, the combination of a rotary device having a plurality of arms thereon, vessel engaging suction heads on said arms for engaging the side of a vessel, means for moving said arms at a predetermined point in their movement to engage the side wall of a vessel, means for rotating the vessel engaging heads to invert the vessels and means for lowering said arms at a predetermined point in their movement for disengaging said vessels, valve members on said arms for controlling the suction effective on said suction heads, and a laterally extending arm for engaging and operating said valve members.

2. In a device of the class described, the combination of vessel engaging means adapted to move in a closed path, means for connecting a source of vacuum to said vessel engaging means, mechanism for lowering said vessel engaging means successively one at a time at predetermined points to engage vessels, a laterally extending arm having means for rendering the vacuum effective upon said heads when they are lowered to a vessel, means for lowering each of said heads independently of the other head at another point in their path to deposit said vessels on a moving conveyor in upright position, and devices for rendering said vacuum ineffective on said heads at said second point.

3. In a device of the class described, the combination of rotary devices having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging heads on said arms, conduits attached to said heads and rotatable therewith, valves in said conduits rotatable therewith, cam members connected to said valves, and stationary means mounted above said arms

for engaging said cams at predetermined points to operate the valves.

4. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging means mounted on said arms, conduits extending from said arms, valves controlling said conduits, cam members connected to said valves, and a plurality of stationary arms adapted to engage and rotate said cams at predetermined points during the rotation of said arms to control a vacuum effective upon said vessel engaging means.

5. In a device of the class described, the combination of a conveyor, a rotatable disc adjacent said conveyor, an arm engaging the vessels on the conveyor to prevent their delivery to the disc, a cam for operating said arm to permit delivery of a vessel at intervals, means for stopping the vessel on said disc, and a rotary device having heads thereon adapted to engage and raise the vessel delivered to said disc and stopped thereon and transfer it to a suitable machine.

6. In a device of the class described, the combination of an arm pivoted to oscillate in a vertical plane, a vessel engaging head mounted on said arm, means for rotating said arm in a horizontal plane, means for oscillating said arm in a substantially vertical plane to engage vessels, a conduit connected with said head for exhausting the air therefrom whereby said head is adapted to engage a container, a rotatable valve in said conduit having an upright member connected to said valve and rotatable therewith, and stationary means adapted to engage said valve operating member to operate said valve at a predetermined point in the rotation of said arm.

7. In a vessel transferring device of the class described, the combination of a rotatable hub member, a plurality of rotatable arms mounted upon said hub member, vessel engaging suction heads mounted on said arms, means for moving said arms into engagement with vessels at a predetermined point in their movement, a laterally extending arm having means thereon for rendering suction effective in the suction heads during the period the head is in engagement with the vessel, and means for moving said vessel engaging head about its longitudinal axis to invert the container, and a laterally extending arm having means thereon to render the suction ineffective to deposit the vessels at another predetermined point in their movement.

8. In a vessel transferring device of the class described, the combination of a plurality of arms, suction heads on said arms adapted to engage the side of a vessel, a cam having a dwell for lowering said vessel engaging heads successively into engagement with vessels, a set screw independent of said cam for limiting the downward movement of said heads, means for subjecting said suction heads to a vacuum, and means for rotating said vessel engaging heads with respect to said arms during the transfer of the vessels.

9. In a vessel transferring device of the class described, the combination of vessel engaging means comprising a plurality of suction heads adapted to engage the side of a vessel, means for moving said heads continuously to engage consecutively the sides of finished vessels delivered upon a conveyor, valves for rendering a source of suction effective upon said suction heads to hold a vessel, and an arm adjustable in position for operating said valves, means for rendering said vacuum ineffective to deposit the vessel in another position, and means for rotating said heads to invert the vessels during transfer.

10. In a device for transferring vessels of the class described, the combination of a rotary device having vacuum operated vessel engaging heads for engaging the mouth of a vessel, means for lowering said heads consecutively at a predetermined point in their travel to engage a vessel, means for moving said heads at another point in their travel for depositing them, valves for subjecting said heads to a vacuum when a vessel is engaged and for relieving said vacuum when the vessel is deposited and laterally extending arms adapted to engage and operate said valves when said valves pass said arms.

11. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging means on said arms, conduits leading to said vessel engaging means and rotatable therewith, valves in said conduits rotatable therewith, cam members connected to said valves, stationary means mounted above said arms for engaging said cams at predetermined points to operate the valves, and means for raising an arm as a vessel is engaged and for lowering the arm when the vessel is released.

12. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging means on said arms, conduits leading to said vessel engaging means and rotatable therewith, valves in said conduits rotatable therewith, cam members connected to said valves, stationary means mounted above said arms for engaging said cams at predetermined points to operate the valves, and means for lowering each arm as a vessel is released.

13. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging heads on said arms, conduits attached to said heads and rotatable therewith, valves in said conduits rotatable therewith, cam members connected to said valves, and stationary means mounted above said arms for engaging said cams at predetermined points to operate said valve.

14. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging means mounted on said arms, conduits extending from said arms, valves controlling said conduits, cam members connected to said valves, a plurality of stationary arms adapted to engage and rotate said cams at predetermined intervals during the rotation of said arms to control a vacuum effective upon said vessel engaging means, and means for lowering said arms at the time the vessel is released to deposit the vessel on a conveyor moving in substantially the same direction as said arms.

15. In a device of the class described, the combination of a rotary device having a plurality of substantially horizontal arms thereon, vacuum operated vessel engaging heads on said arms, conduits attached to said heads and rotatable therewith, valves in said conduits rotatable therewith, cam members connected to said valves, means mounted above said arms for engaging said cams at predetermined intervals to operate the valves, and means for rotating said arms intermediate the time the vessel is engaged and re-

leased to turn the vessel over during its transfer operation.

16. In a device of the class described, the combination of a conveyor for glass containers, a pair of supports for said conveyor, vacuum operated suction heads mounted on one of said supports and adapted to engage the side walls of inverted containers, means for turning said suction heads to invert the containers into their upright position, vacuum conduits operatively connected to said suction heads, valves in said conduits for rendering said vacuum intermittently effective upon said suction head, and mechanism mounted on the other of said conveyor supports for removing the containers from the conveyor.

17. In a device of the class described, the combination of a conveyor moving in a closed path past a fire polishing device, a support for said conveyor, said support having a laterally extending bracket, a shaft mounted in said bracket, a plurality of arms mounted on said shaft and adapted to rotate thereabout, suction heads on said arms and suction conduits leading to said heads, and means for rotating said arms to cause said heads to engage vessels and place them on the conveyor.

18. In a device of the class described, the combination of a conveyor adapted to convey containers past burners for fire polishing the same, a support for said conveyor, a pair of horizontal brackets on said conveyor support, bearings in said bracket adapted to support a vertical shaft, and a plurality of suction heads mounted to rotate about said vertical shaft for placing containers on said conveyor.

19. In a device of the class described, the combination of a conveyor adapted to convey containers past a fire polishing mechanism, a support for said conveyor, a substantially horizontal bracket on said support, a substantially vertical shaft mounted in said bracket, a plurality of suction heads mounted upon said vertical shaft and adapted to rotate thereabout, means for operatively connecting said vertical shaft to said conveyor to rotate said suction heads in timed relation with the conveyor, and means for raising and lowering said suction heads to engage vessels to be fire polished and to place them on said conveyor.

20. In a vessel transferring device of the class described, the combination of a rotary device having a plurality of arms thereon, vessel engaging suction heads on said arms for engaging the side of a vessel, conduits leading to said suction heads, valves in said conduits controlling the suction on said heads, and means for operating said valves at predetermined points, means for moving said arms at a predetermined point in their movement to engage the side wall of a vessel, means for rotating the vessel engaging heads to invert the vessels, means for lowering said arms at a predetermined point in their movement for disengaging the vessels, and additional means cooperating with said arms and operating independently of said lowering means for limiting the downward movement of said arms when the vessels are being discharged.

21. In a vessel transferring device of the class described, the combination of a plurality of arms, suction heads on said arms adapted to engage a vessel, conduits leading to said suction heads, valves for controlling the suction through said conduits, means for lowering said vessel engaging heads successively into engagement with the vessels, set screws operatively connected to said arms to limit the downward movement thereof, and means for subjecting said suction heads to a vacuum.

22. In a device of the class described, the combination of a conveyor, a rotary disc, means for preventing vessels from moving from said conveyor onto said disc, said means being operated periodically to permit delivery of a vessel, means for stopping a vessel on said disc, and means for engaging and raising said vessels while stopped on said disc to deliver them to a finishing machine.

23. In a device of the class described, the combination of a conveyor, a rotatable disc adjacent said conveyor, an arm engaging the vessels on the conveyor to prevent their delivery to the disc, a cam for operating said arm to permit delivery of a vessel at intervals, means for stopping the movement of the vessel on the disc, and a rotary device having suction heads thereon adapted to engage the vessel delivered to said disc and stopped thereon and transfer it to a suitable machine.

24. In a device of the class described, the combination of a plurality of rotatable devices, vacuum operated means attached to said devices, said vacuum operated means including contacting members, a cam for lowering each of said devices successively at predetermined points in their movement independently of the other devices, means for rendering said vacuum effective at a predetermined point and ineffective at another predetermined point whereby said vacuum operated means may engage and disengage vessels, and adjustable arms for engaging said contacting members for varying the position at which said vacuum becomes effective and ineffective.

25. In a device of the class described, the combination of a rotary device, pivoted arms mounted on said rotary device, vacuum operated vessel engaging means attached to said arms, said arms having contacting members thereon, a cam supporting said arms independently of each other and having dwells therein for raising and lowering said arms consecutively at predetermined points, means for controlling the vacuum operated vessel engaging means at said points to render said vacuum effective or ineffective to engage or release vessels at said points, and adjustable arms for engaging said contacting members for varying the position at which said vacuum becomes effective and ineffective.

26. In a device of the class described, the combination of a conveyor, a rotary disc, means for preventing vessels from moving from said conveyor onto said disc, said means being operated periodically to permit delivery of a vessel, means for stopping the movement of the vessel on said disc, and a rotary device having heads thereon for engaging and raising said stopped vessels on said disc and delivering them to a finishing machine.

27. In a device of the class described, the combination of a plurality of conveyor tables for holding containers, a conveyor adapted to move said tables successively past a fire polishing mechanism, supporting means for said conveyor, means supported by said conveyor supporting means adapted to engage inverted containers to invert and deliver them to said tables in upright position, said engaging means comprising a suction head, a vacuum conduit leading thereto, a valve adapted to control the suction effective on said

head, and means for operating said valve, and means also supported by said conveyor supporting means for removing the containers from said tables.

28. In a device of the class described, the combination of a conveyor adapted to move in a closed path, a pair of supports supporting said conveyor at the respective ends of said device, a bracket extending from each of said supports, a vertical member supported by each of said brackets, a plurality of arms rotatable about each of said vertical members, suction heads secured to said arms, the suction heads associated with one of said members when rotated being adapted to engage vessels and place them on the conveyor on one end thereof and the suction heads on the other of said members being adapted to remove the vessels from said conveyor and place them on another conveyor at the other end thereof.

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