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J. E. SCHRODER

1,766,549

WARE CONVEYING HEAD

Filed Nov. 21, 1927

Fig. 1.

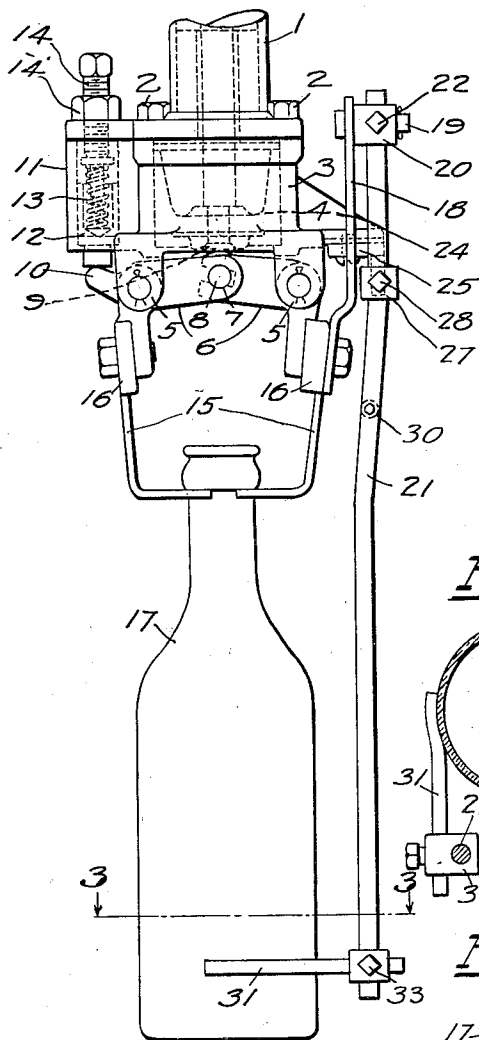


Fig. 2.

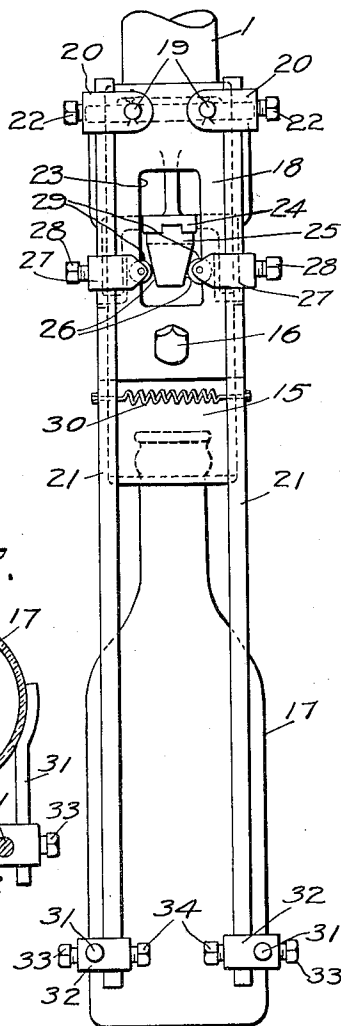


Fig. 3.

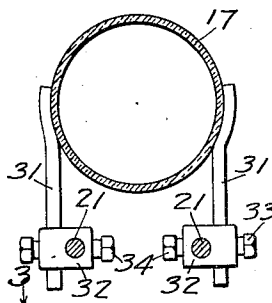
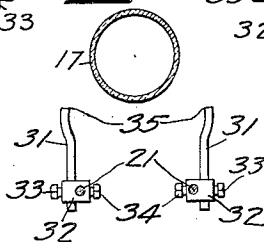


Fig. 4.



Witness:

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WARE-CONVEYING HEAD

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This invention relates to mechanism for transferring articles such as glassware, and more specifically to mechanism for picking up bottles, or other glass articles, at one place and depositing them at another place.

The invention may be incorporated in a lehr stacker, that is, a device for picking up glassware from a conveyor and placing it in an annealing lehr; but it will be apparent that the invention may be employed equally well for removing a glass article from the mold in which it is shaped, or for transferring a partially formed article (a parison or blank) from one mold to another or in numerous other similar services.

A well known type of mechanism of the character described conveys the bottles or other glassware by tongs which grip the upper part of the ware below a shoulder of some kind. Using bottles as a most convenient ware for the purpose of illustration, the tongs close upon the neck of the bottle just below the finish, so that when the bottle is picked up, the finish will prevent it from slipping therethrough. The tongs are usually provided with V-notches, so that the neck of the bottle is engaged by four surfaces, two on each jaw, tangential thereto.

Some difficulty has, however, been experienced in handling certain ware while very hot and semi-plastic due to the fact that movement of the ware which is held at but one point tends to cause distortion and deformation, in the case of bottles, of the neck with respect to the remainder of the bottles. This applies particularly to large bottles.

In addition, difficulty is sometimes experienced in the ware tipping over as it is deposited on the lehr conveyor or other receiving station with possible harmful results.

To overcome these various difficulties, I provide a steadying device which engages the ware at a point spaced from the point of engagement of the tongs, specifically the bottom portion, to prevent any distortion and practically to insure that the ware will remain in an upright position after being deposited.

Among the objects of the present inven-

tion, in addition to those referred to generally above, are to provide a steadying device which may be adjusted as to position to accommodate ware of varying sizes and shapes and for this purpose also to provide for timing the movement of the steadying device as desired with respect to that of the tongs; to provide a steadying device of this character in which the pressure on the work to steady it is resilient in all horizontal directions; to provide a steadying device which will have a minimum of movement toward and away from the tongs, whereby to prevent scratching or deforming the ware; and in general to improve in the construction of steadying devices for the above enumerated purposes.

A further object of the invention is to provide a ware conveying device having tongs to grip the ware adjacent to its top and a steadying device adapted to engage the ware adjacent to its bottom in which the steadying device is movable to an inoperative position when the tongs are open such that ware is movable in lateral directions toward or away from a position in alignment with the tongs and also such that ware may be placed by the device close to other articles in a lateral direction, as in a lehr, without interference between the steadying device and such other articles.

Further objects and advantages of my invention will be apparent from a reading of the following specification and subjoined claims when taken in connection with the accompanying drawings, in which:

Figure 1 is an elevation of the device showing a bottle supported and steadied thereby;

Fig. 2 is an elevation taken from the right hand side of Fig. 1;

Fig. 3 is a section on the line 3—3 in Fig. 1; and

Fig. 4 is a section similar to Fig. 3, but showing the steadying fingers in their inoperative position.

The device comprises a member 1 which may be suitably fixed in any desired type of transferring device, this member being suitably secured at its bottom portion as by

bolts 2 to a cylinder 3 having therein a piston 4. The cylinder 3 is provided with two downwardly extending lugs 5 in which are pivoted a pair of bell-crank levers 6, the inner ends 7 of which are inter-connected for simultaneous movement in a suitable manner as by providing one of the levers 6 with a bifurcated end in which works a pin 8 fixed in the other of the levers. The piston 4 is provided with a suitable abutment or boss 9 for engagement with the joint 7 of the levers 6 so that upon admission of fluid pressure into the space above the piston 4, the levers 6 will be swung about their respective pivots in the lugs 5.

A projection 10 may be formed upon one of the levers 6 adjacent to its pivot and projecting laterally beyond the side of the cylinder 3. I provide suitable means engaging the lug 10 to move the lever 6 in a direction opposite to that in which they are moved by the fluid pressure in the cylinder 3, such means in the present instance being in the form of a cylinder 11 having a piston 12 therein which engages the lug 10, the piston being forced downwardly by a spring 13, the compressive force of which is adjustable by means of a screw 14 threaded in the top or head of the cylinder 11, which screw may be secured in adjusted position by a jam nut 14'.

A pair of tongs 15 are provided, one connected to each of the levers 6 in any suitable manner as shown at 16, these connections preferably having provision for adjustment of the tongs toward and away from the levers 6, which may be accomplished by providing elongate slots (not shown) in the upper ends of the tongs 15. The lower ends of the tongs may be provided with V or arcuate-shaped notches for engagement with the upper portion of the articles of glassware, such as the bottle 17 shown.

For the purpose of steadying the lower portion of the article 17 being conveyed, I provide a member 18 which is secured to one of the members 6, as shown in Figs. 1 and 2, this preferably being accomplished by one of the same screws used to hold one of the tongs 15 in position. At its upper end, the member 18 is pivotally connected at 19 with a pair of oppositely disposed bracket members 20, these members having connected thereto substantially vertical rods 21 and having provision, such as set screws 22, for permitting the adjustment of the vertical position of the rods 21.

The member 18 is provided with an aperture 23 through which extends a projection 24 which may be integral with or suitably secured to the cylinder member 3, and which carries a member 25 having a pair of cam surfaces 26 at each side of its downwardly projecting portion. The rods 21 are provided with longitudinally adjustable brack-

ets 27 held thereon by set screws 28 and having at their inner portions rollers 29 which engage the cam surfaces 26 to rotate the rods 21 about their pivots 19 when these pivots are moved to move the rollers along the cam. Suitable means, such as a tension spring 30, extend between the rods 21 intermediate their ends resiliently to urge them toward each other. The rods are provided at or adjacent to their lower ends with suitable fingers 31 which are fixed thereto through brackets 32 having provision for both angular and longitudinal adjustment both with respect to the fingers 31 and with respect to the rods 21 by the provision of set screws 33 and 34 respectively. It is contemplated also that the fingers 31 may be interchanged with fingers of other shapes or sizes to accommodate ware of various shapes.

Inasmuch as the member 18 is of relatively thin sheet metal, it has a certain resilience which, combined with the resilience of the rods 21 and that of the spring 30, results in the fingers 31 holding the article 17 with a resilient pressure in all directions in a horizontal plane. Furthermore, inasmuch as the vertical movement of the rods 21 with respect to the stationary parts of the device and the tongs 15 is relatively slight during the engagement of both the tongs and the fingers with the ware, there will be little, if any, relative vertical movement between these parts which might scratch or deform the article being conveyed.

Inasmuch as the brackets 27 are individually vertically adjustable with respect to the rods 21, it is obvious that the timing of the movement of one or both of the fingers 31 with respect to the movement of the tongs 15 may be varied at will. Also, as the fingers 31 are longitudinally and angularly adjustable with respect to the rods 21, and also as their inner ends 35 may be adjusted toward and away from these rods, it is clear that bottles or other ware of various sizes and shapes may be accommodated. This adjustability is still further augmented by the interchangeability of the fingers 31.

In addition, in view of the fact that the rods 21 are longitudinally adjustable with respect to each of the brackets 20, 27 and 32, these rods may be adjusted up or down without varying the relative positions of the tongs 15 and the fingers 31, to vary the distance between the spring 30 and the points 19 of pivotal support of the rods and thus vary the resilient pressure of the rods 21 upon the article being conveyed. Thus it will be seen that the necessary adjustments may be made to accommodate ware of almost any desired configuration or size.

Due to the arrangement of the actuating mechanism, i. e. the member 18, pivots 19

and cam and roller devices, the upper ends of the rods 21 will be swung inward toward the supporting member 1 about one of the pivots of the right hand member 6 in the lug 5 as a center, as seen in Fig. 1 thus swinging the lower end of the rods 21 and the fingers 31 away from the ware to a point shown in Fig. 4 where a straight line joining the inner ends 35 of the fingers 31 will lie wholly on one side of the ware 17 and on the other side of the fingers 31 and rods 21, this action being in addition to and simultaneous with that of spreading the rods 21 by swinging them about their pivots 19, performed by the cam and roller arrangement. The advantages of this construction are that the fingers 31 are entirely clear of the ware at their inoperative position permitting the ware to be moved laterally toward or away from a position in alignment with the tongs 15 and also permitting the article being conveyed to be placed beside or between other ware in a lateral row, such as the usual arrangement upon the conveyor belt of a lehr, without the fingers 31 engaging or interfering with the articles on either side of the article being conveyed.

As many modifications might be made in my device without departing from the spirit of the invention, I do not wish to be limited to the specific construction here shown and described, but merely by the scope of the appended claims, which are to be construed as broadly as the state of the prior art permits.

I claim as my invention:

1. In a ware conveying mechanism, a ware gripping device comprising a support, a pair of bell-crank levers pivotally mounted thereon, a pair of ware gripping tongs connected respectively to one arm of each of said levers, the remaining arms of said levers being interconnected for simultaneous motion, a fluid pressure operated piston, means associated with said piston to operate said levers to open said tongs, a projection on one of said bell-crank levers, and resilient means associated with said projection tending to close said tongs about the ware.

2. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the ware adjacent to its top, means to open and close said tongs, a pair of steadying fingers to engage the ware adjacent to its bottom, and means to operate said fingers to bring them into and out of engagement with the ware, the parts being so constructed and arranged that the direction of the gripping action of said tongs is substantially perpendicular to that of said fingers.

3. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs pivotally mounted thereon

to swing toward each other to engage the top portion of the ware, a pair of substantially vertical rods pivotally mounted adjacent to said support to swing in a direction substantially perpendicular to the direction of swing of said tongs, bottle engaging fingers secured to said rods and adapted to engage the lower portion of the ware to steady it, and means for operating said fingers.

4. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of independently movable fingers to engage the lateral sides of the lower portion of the ware to steady it, and means to move said fingers to an inoperative position in which the ware is free to move in a lateral direction.

5. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers to engage the lateral sides of the lower portion of the ware to steady it, and means to move said fingers in three dimensional paths to positions entirely clear of the ware.

6. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers adapted to engage the lateral sides of the lower portion of the ware to steady it, and means to move said fingers to in operative positions so that a straight line would pass between the fingers and the ware.

7. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, and a pair of fingers adapted to engage the lower portion of the ware to steady it, said fingers being resiliently movable in every direction in a substantially horizontal plane.

8. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers adapted to engage the lower portion of the ware to steady it, means for actuating said tongs to grip the ware, and means for actuating said fingers to engage the ware, said tongs and said fingers being spaced apart at substantially a constant distance throughout the opening and closing movements of both, whereby to prevent distortion of and injury to the ware.

9. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the

ware, a pair of fingers adapted to engage the lower portion of the ware to steady it, and means for individually varying the degree of movement of each of said fingers, whereby ware of varying sizes and shapes may be accommodated.

10. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers mounted for movement with respect to said support and adapted to engage the lower portion of the ware to steady it, means for actuating said tongs to grip the ware, rods to which said fingers are secured, a stationary cam, cam rollers individually adjustable along each of said rods, whereby to vary the movement of said fingers with a given differential movement between said cam and said rollers, and means operable by said tongs for giving said rods such a differential movement.

11. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers adapted to engage the lower portion of the ware to steady it, means for actuating said tongs to grip the ware, means operable by movement of said tongs for actuating said fingers, and means associated with each of said fingers for independently adjusting the path of its movement with respect to the movement of said tongs.

12. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, a pair of fingers adapted to engage the lower portion of the ware to steady it, means resiliently to urge said fingers toward one another to engage the ware, and means independent of the spacing of said tongs from said fingers for varying the resilient pressure of the fingers on the ware.

13. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon, means to move said tongs simultaneously toward and away from each other, an apertured member carried by one of said tongs, a pair of rods pivoted to the outer end of said member to swing in a direction substantially perpendicular to the direction of movement of said tongs, a cam protruding through the aperture in said member, means on each of said rods to engage said cam to spread their lower ends on movement of said tongs to open position, and fingers on said rods adapted to engage and steady the lower portion of the ware.

14. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon,

means to move said tongs simultaneously toward and away from each other, a resilient apertured member carried by one of said tongs, a pair of rods pivoted to the outer end of said member to swing in a direction substantially perpendicular to the direction of movement of said tongs, a cam protruding through the aperture in said member, means on each of said rods to engage said cam to spread their lower ends on movement of said tongs to open position, resilient means tending to draw said rods together, and fingers on said rods adapted to engage and steady the lower portion of the ware, whereby said fingers are resiliently held against the ware in all directions in a substantially horizontal plane.

15. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon, means to move said tongs simultaneously toward and away from each other, an apertured member carried by one of said tongs, a pair of rods pivoted to the outer end of said member to swing in a direction substantially perpendicular to the direction of movement of said tongs, a cam protruding through the aperture in said member, means on each of said rods to engage said cam to spread their lower ends on movement of said tongs to open position, and fingers on said rods adapted to engage and steady the lower portion of the ware, said rods being secured to said member so as to permit longitudinal adjustment thereof to vary the distance between said tongs and said fingers.

16. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon, means to move said tongs simultaneously toward and away from each other, an apertured member carried by one of said tongs, a pair of rods pivoted to the outer end of said member to swing in a direction substantially perpendicular to the direction of movement of said tongs, a cam protruding through the aperture in said member, means on each of said rods to engage said cam to spread their lower ends on movement of said tongs to open position, and fingers individually vertically adjustably mounted on said rods and adapted to engage and steady the lower portion of the ware.

17. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon, means to move said tongs simultaneously toward and away from each other, an apertured member carried by one of said tongs, a pair of rods pivoted to the outer end of said member to swing in a direction substantially perpendicular to the direction of movement of said tongs, a cam protruding through the aperture in said member, means on each of said rods to engage said cam to spread their

lower ends on movement of said tongs to open position, a tension spring extending between said rods intermediate their ends, and fingers individually adjustably mounted on said rods and adapted to engage and steady the lower portion of the ware, said rods being secured to said member to permit of a longitudinal adjustment thereof to vary the tension exerted on said fingers by said spring.

18. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted resiliently to engage the top portion of the ware, a pair of fingers adapted to engage the lower portion of the ware to steady it, means responsive to the movement of said tongs to move said fingers into and out of engagement with the ware, means individually adjustable with respect to each of said fingers for varying the timing and extent of such movement with respect to that of said tongs, means for individually adjusting the spacing of said fingers from said tongs, means resilient in all directions in a substantially horizontal plane for urging the fingers to engage the ware, and means for varying such resilient pressure in one such direction.

19. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, substantially vertical rods, a pair of fingers supported by said rods and adapted to engage the lower portion of the ware to steady it, and means for connecting said rods and fingers so that the fingers may be adjustable longitudinally and angularly about a predetermined point adjacent to the lower ends of said rods.

20. In a ware conveying mechanism, a ware holding device comprising a support, a pair of gripping tongs mounted thereon and adapted to engage the top portion of the ware, substantially vertical rods, a pair of fingers supported by said rods and adapted to engage the lower portion of the ware to steady it, interconnecting brackets between said rods and said fingers, and means permitting both rods and fingers to be longitudinally and angularly adjustable with respect to said brackets, and also permitting interchange of fingers of various types.

Signed at Hartford, Conn. this 19th day of November 1927.

JOHN E. SCHRODER.