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GLASS TRANSFER APPARATUS

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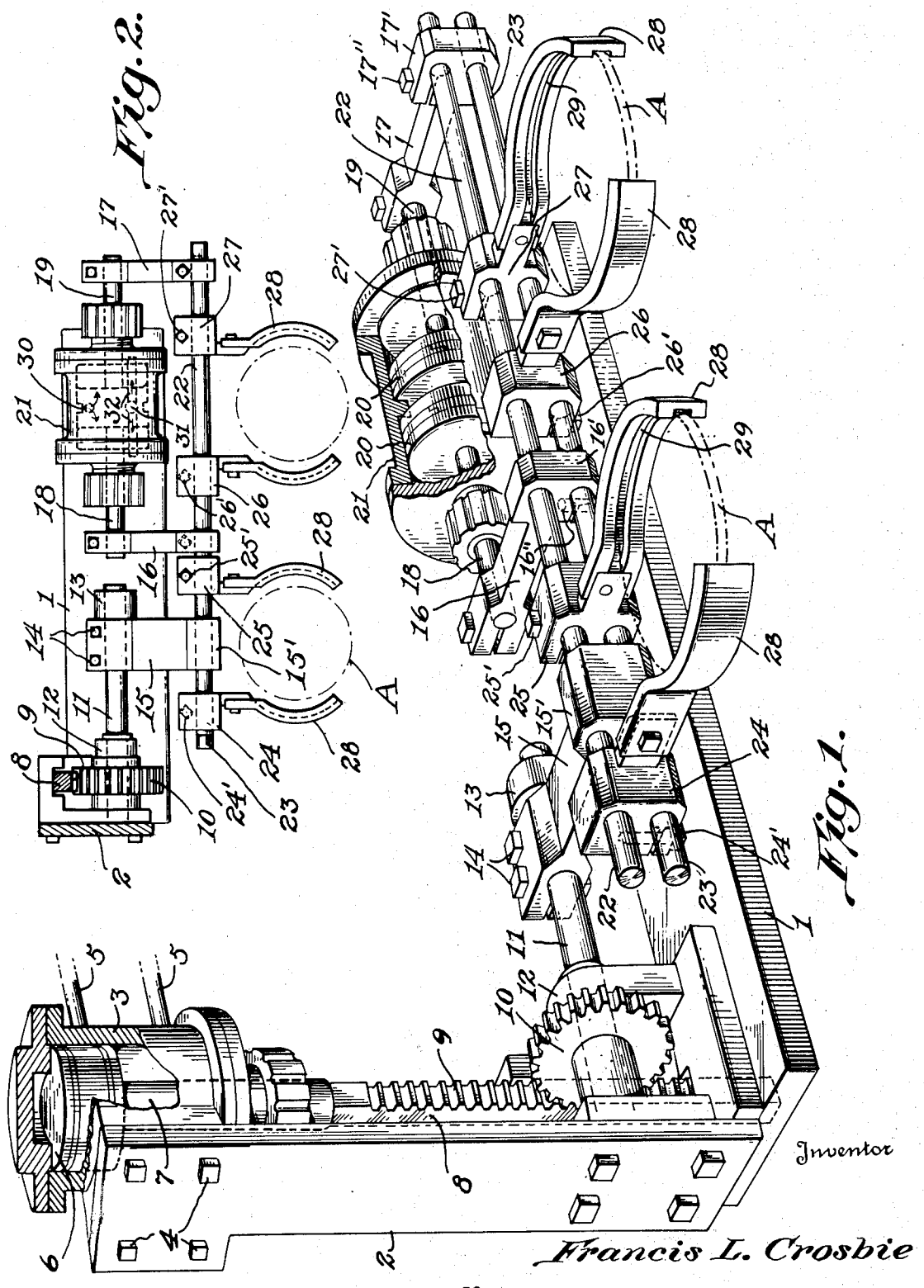


Fig. 1.

Fig. 2.

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GLASS TRANSFER APPARATUS

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This invention relates to take-out mechanisms for use in conjunction with forming machines for glass articles and is similar in some respects to the take-out device disclosed in the patent of James W. Ross, No. 1,858,642, granted May 17, 1932.

One of the objects of the invention is to provide a take-out mechanism which is more simple in construction and more efficient in operation than those previously known.

Another object of the invention is to provide a take-out mechanism which is capable of functioning with forming machines in which two articles are formed simultaneously, and which will simultaneously grasp two articles, transport them to a conveyer and release them.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawing, in which,

Figure 1 is a perspective view of the complete device with parts broken away to more clearly show the construction, and

Figure 2 is a plan view of the device, with parts in section, on a smaller scale.

Referring to the drawing in more detail, the numeral 1 indicates a base plate for the mechanism and which may be supported in any suitable manner adjacent the forming machine. Mounted on one end of plate 1, as by bolts or the like, is a standard or bracket 2 which forms a support for an operating cylinder 3.

The cylinder 3 is secured in upright position on the bracket 2 as by means of bolts 4 and is supplied with motive fluid, preferably compressed air, by means of pipe lines 5. These lines are preferably provided with ordinary hand valves (not shown) to control the volume of fluid supplied to opposite ends of the cylinder; and the admission and exhaust of fluid pressure is timed in accordance with the operation of the forming machine, by any ordinary and well known timing device.

The piston 6 of cylinder 3 is mounted on a piston rod 7 which carries an extension 8 of rectangular cross section and provided with teeth to form a rack bar 9. This rack meshes with a pinion 10 keyed to a horizontal shaft 11. The shaft 11 is mounted in suitable bearings 12 and 13 on the base plate 1, and it will be obvious that the reciprocations of the rack 9 will cause the shaft to oscillate in its bearings. The length of the piston stroke and the diameter of the pinion 10 are such that the shaft will be caused to turn through substantially 180° at each stroke of the piston.

Clamped to the shaft 11, as by means of bolts 14 is a crank arm 15 which serves to support and carry the take-out mechanism proper, to be presently described. The opposite end of the take-out mechanism and its intermediate portion are supported by a pair of arms 16 and 17 which are clamped to piston rods 18 and 19; the latter being in direct alignment with the shaft 11. These rods 18 and 19 are secured to twin pistons 20—20 mounted in a cylinder 21 supported on plate 1.

Slidably mounted in a pair of openings in the head 15′ of crank arm 15 is a pair of rods 22 and 23 which jointly carry two pairs of jaw arms 24, 25, 26 and 27. The rods 22 and 23 are also supported in the heads 16′ and 17′ of arms 16 and 17. It is to be noted however that while the rods are both slidably mounted in the head 15′ they are fixed with respect to the one or the other of the heads 16′ and 17′. For instance, the rod 22 is clamped to the head 17′ by means of a clamping bolt 17″ while it is slidable with respect to head 16′. Likewise, rod 23 is clamped to head 16′ by bolt 16″ but is slidably associated with head 17′. It will be apparent therefore that the rods 22 and 23 are caused to reciprocate in opposite directions as motive fluid is alternately admitted to the middle and ends of the cylinder 21.

So also, the jaw arms 24, 25, 26 and 27 are each provided with two openings to provide for special connections with the rods 22 and 23. The arms 24 and 26 are provided with bolts 24′ and 26′ for clamping the arms to the rod 23 while the rod 22 is slidably mounted in these arms. Arms 25 and 27 are provided with bolts 25′ and 27′ for clamping these arms to the rod 22 while the

rod 23 is freely slidable with respect to these arms. It will be apparent therefore that the reciprocation of the rods 22 and 23 will cause the arms of each pair to move toward and from each other.

Grippers 28 are bolted to the arms 24 to 27, inclusive, and preferably have their inner arcuate faces slotted or grooved as indicated at 29, to facilitate gripping the rim of the ware being handled. Obviously these grippers are caused to grip or release the ware in accordance with the movements of the pistons 20—20 and the rods 22 and 23 operatively connected therewith.

Numeral 30 refers to a port through which fluid pressure is admitted to the center of the cylinder 21, to cause the pistons 20 to move away from each other; the fluid pressure being eventually exhausted through the same port. Numeral 31 refers to a port for simultaneously admitting pressure to opposite ends of the cylinder through passages 32, 32; the pressure being eventually exhausted through the same passages and port.

Pipe lines (not shown) lead to the ports 30 and 31, and the timing of the admission and exhaust of the fluid pressure is controlled by any ordinary and well known timing device. If desired, ordinary volume control hand valves may be provided in the lines leading to the ports 30 and 31.

In the operation of the device, the parts being in the positions indicated in Figure 2, the articles A, shown in dot and dash outline, have been presented to the grippers 28 in the usual way. Fluid pressure is now admitted to the opposite ends of the cylinder 21 to force the pistons 20 toward each other to their innermost positions, as indicated in Figure 1. This movement of the pistons operates through arms 16—17 and rods 22—23 to move the jaws of each pair of grippers toward each other to cause them to grip the articles as indicated.

Fluid pressure is now admitted to the upper end of cylinder 3 to move the rack 9 down, thereby rotating the pinion 10 and shaft 11 through substantially 180°. The grippers 28 and the ware clamped therein are then swung through approximately 180° to lug the ware over a conveyer or chute leading to a leer.

Fluid pressure is now admitted to the center of the cylinder to drive the pistons away from each other towards the ends of the cylinder, thereby reversing the movement of the rods 22—23 and separating the grippers 28—28 to release the articles and deposit them on a conveyer or chute to be carried to the annealing leer.

Fluid pressure is now admitted to the lower end of cylinder 3 to lift the rack 9, thereby swinging the parts back to their original positions, ready to grip the next pair of articles.

From the foregoing description it will be apparent to those skilled in the art that I have provided a take-out mechanism which is very simple in construction and operation, and which is capable of transferring one article at a time, or two or more articles at a time, as desired.

In accordance with the patent statutes I have described what I now believe to be the preferred form of construction, but various changes and modifications may be made without departing from the spirit of the invention; and it is intended that all such changes and modifications be included within the scope of the appended claims.

What I claim is:

1. Apparatus for transferring glassware, including a pair of grippers movable in opposite directions in a rectilinear path, a cylinder, two pistons and piston rods operated by said cylinder, each of said piston rods operatively connected with one of said grippers, and means for rotating the grippers through substantially 180°.

2. Apparatus for transferring glassware, including a pair of parallel rods, means for simultaneously reciprocating said rods in opposite directions, and two gripping elements fixed to each of said rods, the gripping elements of one rod cooperating with the gripping elements of the other rod to simultaneously grip two pieces of glassware.

3. Apparatus for transferring glassware, including a pair of parallel rods, means for simultaneously reciprocating said rods in opposite directions, and two gripping elements fixed to each of said rods, the gripping elements of one rod cooperating with the gripping elements of the other rod to simultaneously grip two pieces of glassware, and means for oscillating the grippers through substantially 180°.

4. Apparatus for transferring glassware, including a pair of parallel rods, means for simultaneously reciprocating said rods in opposite directions, two members fixed to each of said rods and slidable on the other rod, a gripping element carried by each of said members, the gripping elements of one rod cooperating with the gripping elements of the other rod to simultaneously grip two articles of glasware, and means for oscillating the grippers through substantially 180°.

5. Apparatus for transferring glassware, including a pair of gripping elements, a horizontally arranged cylinder, connecting means between the cylinder and gripping elements for opening and closing said gripping elements, and means for swinging the gripping elements about said horizontal cylinder as a pivot.

6. Apparatus for transferring glassware, including two aligned piston rods, a plu-

rality of pairs of grippers operatively connected with the piston rods, and means for oscillating the grippers about the piston rods as an axis.

7. Apparatus for transferring glassware, including two aligned piston rods, a plurality of pairs of grippers operatively connected with the piston rods, a single cylinder for moving the piston rods toward and away from each other to close and open the pairs of grippers, and means for oscillating the grippers about the piston rods as an axis.

8. Apparatus for transferring glassware, including a pair of parallel rods, two members fixed to each rod and slidable on the other rod, a gripping element carried by each member, two arms, each arm fixed to one of the rods and slidable on the other rod, a horizontal cylinder, two pistons and piston rods operated by said cylinder, said arms being mounted on said piston rods, and means for oscillating the gripping elements about the piston rods as an axis.

9. Apparatus for transferring glassware, including a pair of parallel rods, two members fixed to each rod and slidable on the other rod, a gripping element carried by each member, two arms, each arm fixed to one of the rods and slidable on the other rod, a horizontal cylinder, two pistons and piston rods operated by said cylinder, said arms being mounted on said piston rods, a third member through which both of said rods are slidable, a crank arm carrying said member, and means for oscillating said crank arm through substantially 180°.

10. Apparatus for transferring glassware, including a pair of parallel rods, two members fixed to each rod and slidable on the other rods, a gripping element carried by each member, two arms, each arm fixed to one of the rods and slidable on the other rod, a horizontal cylinder, two pistons and piston rods operated by said cylinder, said arms being mounted on said piston rods, a third member through which both of said rods are slidable, a crank arm carrying said member, a shaft to which the opposite end of said crank arm is fixed, a pinion keyed to said shaft, a rack operatively connected with the pinion, and a cylinder for reciprocating the rack.

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