

C. F. MOTZ,
SAND BLAST MACHINE.
APPLICATION FILED APR. 9, 1917.

1,317,809.

Patented Oct. 7, 1919.

3 SHEETS—SHEET 1.

FIG. 9

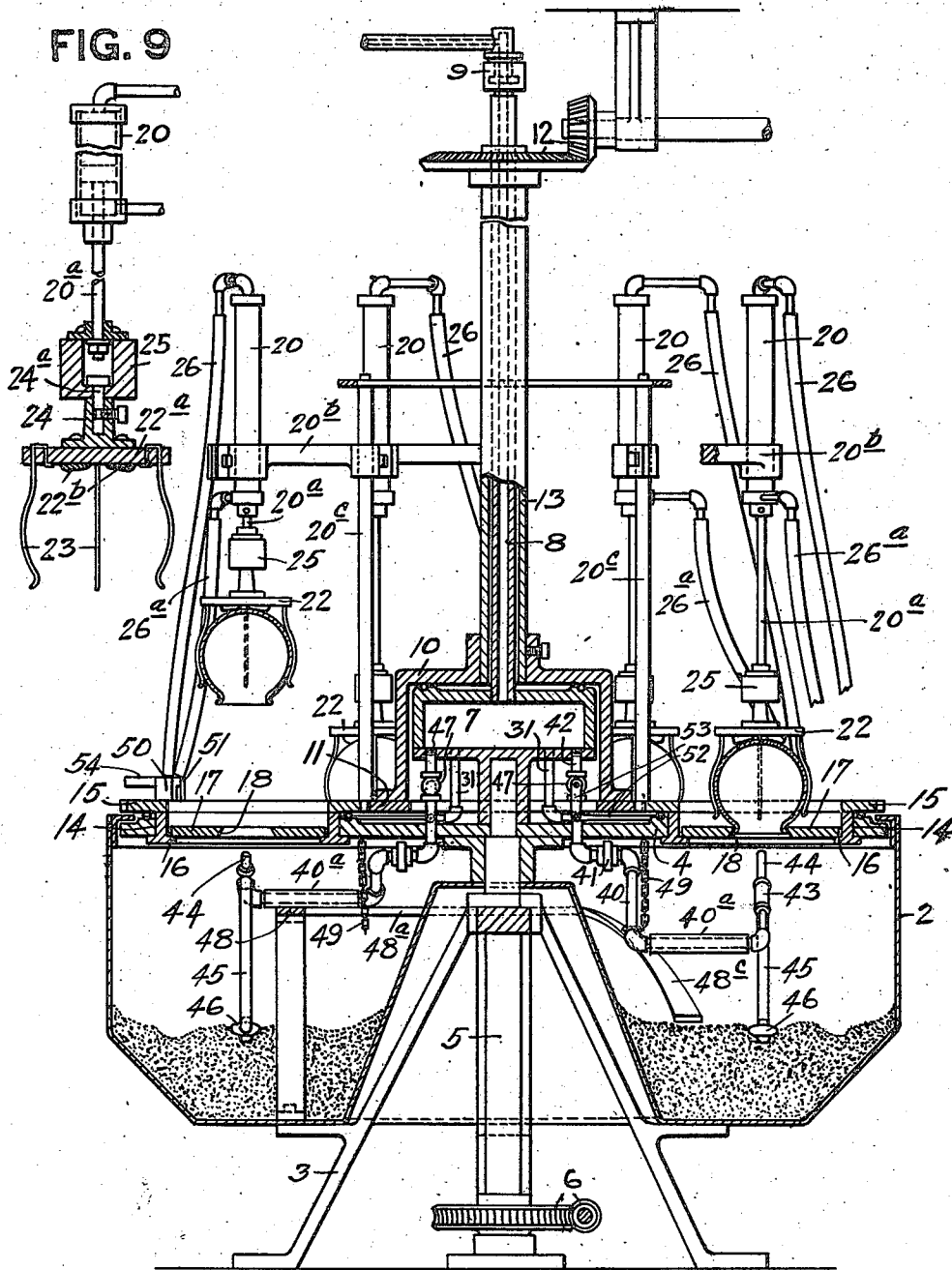


FIG. 1

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3 SHEETS—SHEET 2.

FIG. 2

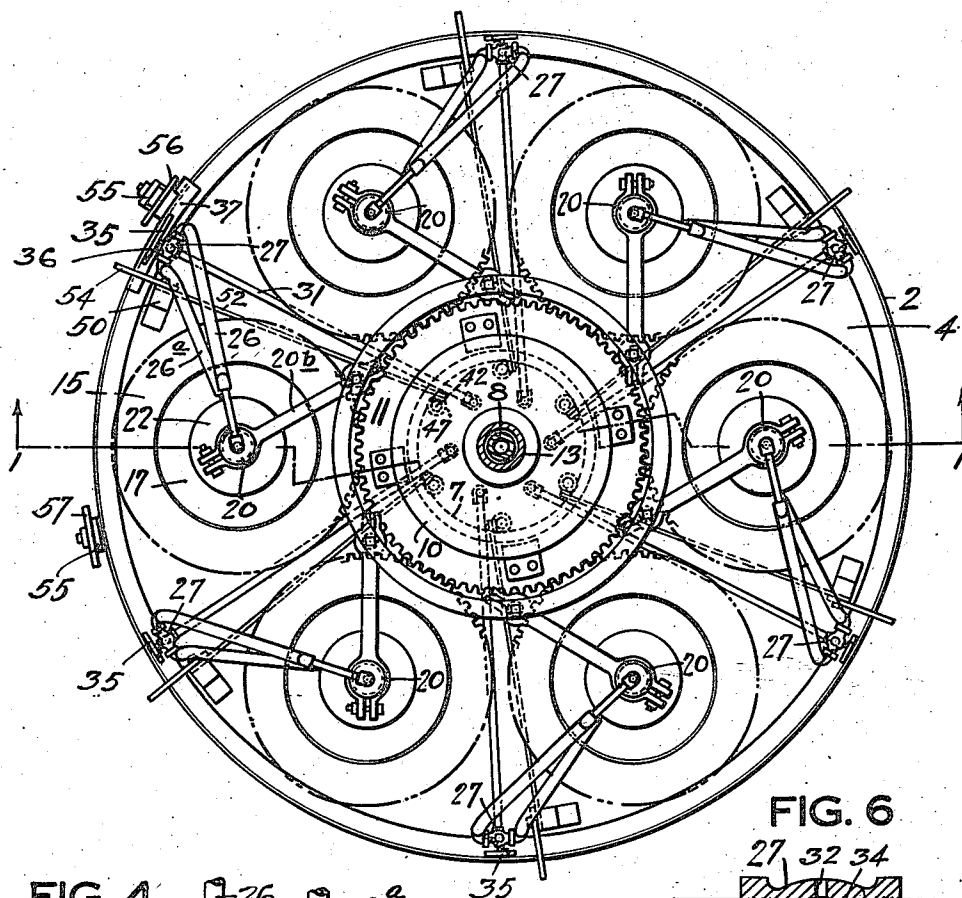


FIG. 4

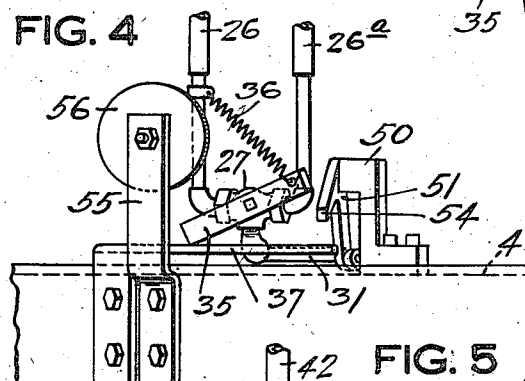


FIG. 6

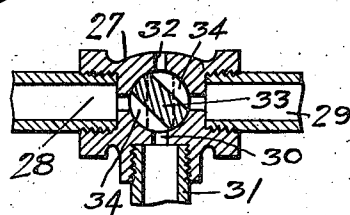
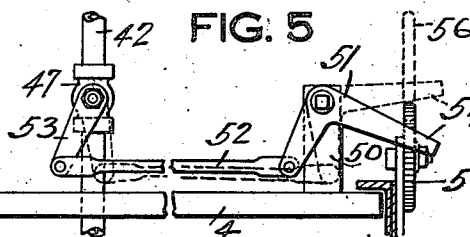


FIG. 5



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3 SHEETS—SHEET 3.

FIG. 3

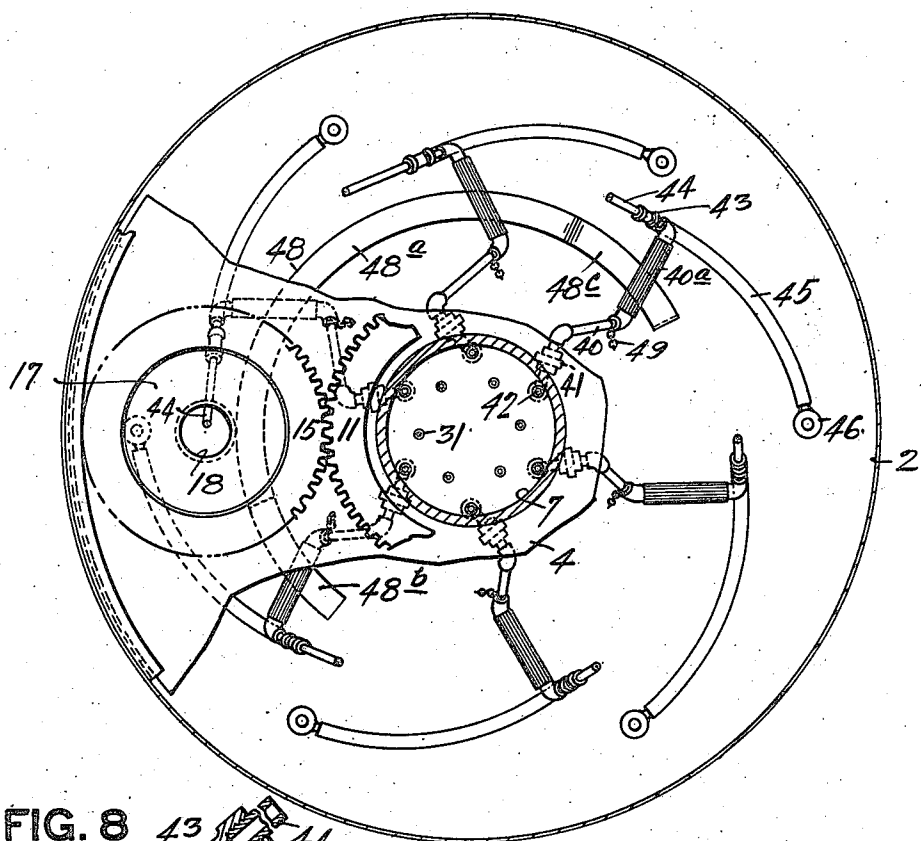


FIG. 8

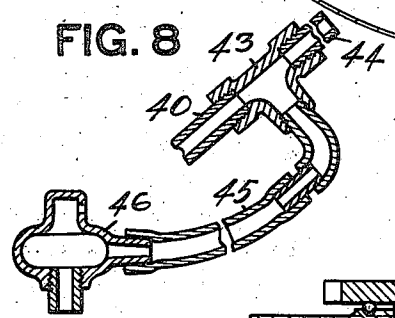
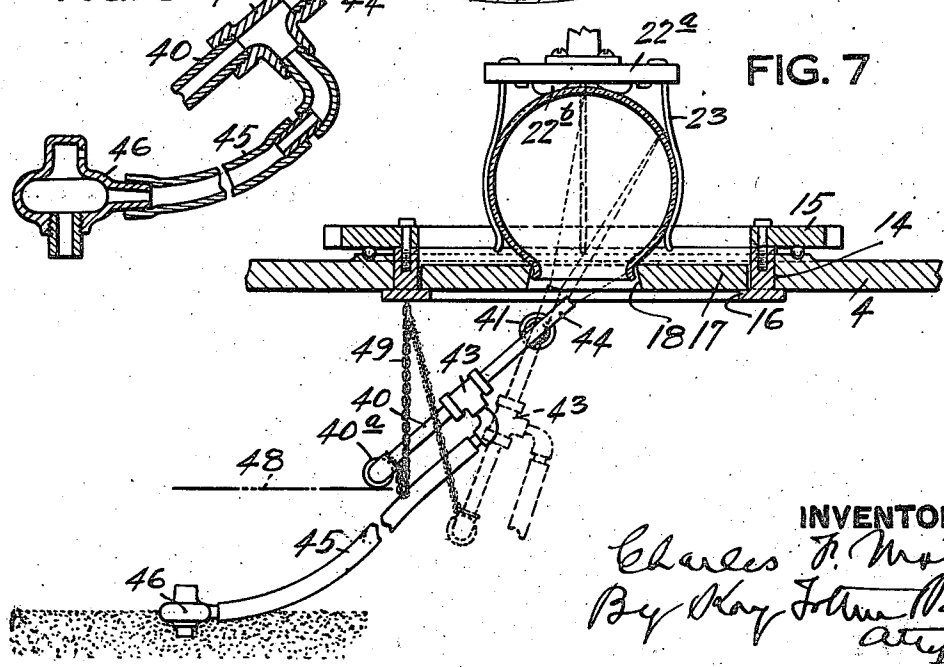


FIG. 7



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UNITED STATES PATENT OFFICE.

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SAND-BLAST MACHINE.

1,317,809.

Specification of Letters Patent.

Patented Oct. 7, 1919.

Application filed April 9, 1917. Serial No. 160,708.

To all whom it may concern:

Be it known that I, CHARLES F. MOTZ, a citizen of the United States, and resident of Monaca, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Sand-Blast Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

10 My invention relates to sand blast machines, and more especially to a class of machines for sanding or "frosting" glass articles.

15 Heretofore, in the operation of sand-blasting glassware, such as shades and globes, the article to be sanded interiorly has been operated on singly, and generally in separate machines; in some instances of exterior sanding of such articles, a pair of articles have 20 been operated on simultaneously in a single machine.

The present invention aims to provide a sanding machine in which a large number of pieces of ware are simultaneously operated 25 on, and in which the operation of feeding the ware to, and removing the ware from the machine is of a continuous character, from a fixed position. That is to say, the pieces to be operated on, and the finished 30 pieces, are fed by the operator to the machine and removed therefrom separately, in succession and alternate fashion.

A further object of the invention is to provide a machine of the above character in 35 which all of the ware is handled at one point of the machine.

A further object is to provide means for the automatic regulation of the air blast for sanding and for other operations of the 40 machine.

The invention consists in the novel features of construction and in the combination and arrangement of parts hereafter described.

45 The invention is illustrated in the accompanying drawings, in which Figure 1 is a vertical sectional view of my machine; Fig. 2 is a plan view; Fig. 3 is a horizontal section and part plan view of the sanding hopper, showing the flexible sanding nozzles; 50 Figs. 4 and 5 are enlarged detail views of automatic devices for actuating the valves controlling the supply of air to the machine; Fig. 6 is a detail of one of the above-mentioned valves for controlling the supply of 55 air to a cylinder for raising and lowering

the ware; Fig. 7 is an enlarged vertical section of a portion of the rotary ware table, showing a piece of ware in position while operated on by the sand blast; Fig. 8 is a 60 sectional view of a sanding nozzle; Fig. 9 is a vertical section of the swivel carrier or ware holder.

The numeral 2 represents a sand receptacle supported on a standard 3. The top 65 of the receptacle is covered with a revoluble ware-carrying plate 4 which is supported on and rotated by a vertical shaft 5. The shaft is journaled in the standard centrally of the 70 receptacle, and is driven by the worm-gearing 6. Secured to an extension of the shaft above the cover-plate is the air-drum 7. This drum is supplied with air at suitable pressure for the sanding operation, and for 75 other operations, as will hereinafter be described. The air enters the drum through pipe 8, a suitable flexible air-connection 9 connecting this pipe to the source of air-supply. Drum 7 forms a bearing for the 80 support of a spider-member 10 to which is fastened the main ware-revolving gear 11. The spider is rotated by a tubular shaft 13 which is fast to the spider and is driven by gearing 12.

The ware-table or cover-plate 4 is provided with a number of openings 14; these 85 openings are uniformly spaced apart, and lie in a circle concentric with the spur-gear 11. Each opening represents a ware position of the machine, and in this instance, 90 six of such positions are shown. It may be desirable with some kinds of ware to provide a machine with a greater or a less number of ware positions, and I do not wish to limit my invention to any particular machine capacity. Each opening forms a circular bearing 95 into which is fitted a ware-revolving gear 15, the gear of each opening meshing with the main drive-gear 11. These gears are provided with internal flanges 16 for the 100 support of a ware-supporting member or seat 17. This seat, preferably, is a wooden plate or disk formed with a central opening 18, through which the sand blast is directed, and in the particular instance illustrated the 105 seat is adapted to support an inverted globe for internal sanding. Modification of the opening adapts this seat for use for external sanding. For instance, the ware may be fitted into or suspended from such an opening 110 to be acted on by the sand blast. Other forms of seats and means for centering and

supporting the ware may be used, and I do not wish to restrict the invention to any particular form of ware support.

The ware is held to its seat during the sanding operation by an air-actuated holder 22, which is adapted to be raised and lowered automatically at the operator's stand for the removal of the sanded piece, and for replenishing the holder as the revolving table brings each ware-holder in succession to this position. The holder is actuated by an air cylinder 20. A cylinder 20 is provided at each ware position of the machine, the piston-rod of which carries the holder. 15 The holder comprises a plate or disk 22^a provided with cushioning means 22^b, and has the spring fingers 23 for gripping the ware, as clearly shown in Fig. 9. The holders are detachable, and are made in various forms and sizes to suit the different kinds of ware for which the machine is adapted. A sleeve 24 and bolt 24^a connect the holder to a swiveling connection 25 on the piston-rod 20^a. This connection is loosely journaled on the piston-rod and bolt 24^a, and is adapted to rest on the sleeve of the holder during the sanding operation or when the holder is lowered to act as a weight to hold the ware to its seat. By the above arranged connection, it will be seen that the seated ware is free to rotate as the gear 15 rotates. Cylinders 20 are mounted on adjustable brackets 20^b on standards 20^c which are fixed to the revolving ware-table 35 or cover-plate 4. Flexible air-connections 26 and 26^a connect the top and bottom ends respectively of the cylinder 20 to an automatically-actuated air-valve 27. This valve is a three-way plug-valve, see Fig. 6, having the outlets 28 and 29 connected to pipes 26 and 26^a, respectively, the inlet port 30 connecting by a pipe 31 to the air-drum 7. The valve is provided with the exhaust opening 32. The plug 33 of valve is formed with two like recesses 34. One of said recesses is adapted when the plug is turned to operative position to form a communicating passage between the inlet and one end of the cylinder 20, while the other recess 50 forms a passage between the exhaust passage 32 and the opposite end of the cylinder. When the plug is turned to the position as shown in Fig. 6, air is in communication with the top of the cylinder above the piston, and this figure represents the position of the valve-plug when moved to admit air to the cylinder to lower the holder. Air is maintained within the cylinder above the piston as long as the valve remains in this position. The valve is provided with an operating arm 35, controlled by a spring 36. Mounted on the machine near the operator's stand is a stationary cam-plate 37. As the table rotates carrying the valve with it, the 65 operating arm of the valve is brought into

engagement with the cam-plate causing the arm to rotate the plug of the valve so as to bring into register the ports of the valve which communicate with the bottom of the cylinder, causing the ware-holder to be elevated, displacing the air above the piston by exhausting through port 32, and thus providing cushioning means for the upstroke of the piston. The ware-holder remains in elevated position as long as the valve-arm 75 rides on the cam-plate, the plate being of such length as to provide ample time for the operator to remove the sanded piece and insert into the holder a piece to be operated on before completion of travel of the arm 80 over the plate. When the arm has moved off the plate, the spring 36 acts to return the plug of the valve to its normal position, directing air again into the top of the cylinder to lower the ware-holder in position for the sanding operation. It will be noted, air is maintained in the cylinder above the piston during the sanding operation or for that part of the revolution of the table when the arm of the valve is not engaged by the cam-plate 37. Other valve structures may be employed to actuate the holder in which the air is cut off during the sanding operation, but I prefer to employ the structure as shown, as in this instance, 95 air is always instantly available for cushioning the upward stroke of the piston. Obviously, the air maintained in the cylinder above the piston during the sanding operation may be employed to act as means for holding the ware to its seat, without change in the above-described structure of the cylinder and holder, in which case, the swivel connection acts as supplemental means for holding the ware down in case of cylinder 105 leakage, and it is to be understood the invention contemplates the employment of such an air-actuated ware-holder.

The sanding mechanism includes suitable sanding nozzles carried by the table beneath the ware-openings, and adapted to direct the sand as the table revolves so as to act on all portions interiorly of the ware. The mechanism as illustrated in Figs. 1 and 5 comprises the air-pipe 40, which is suspended from a swing-joint 41 connecting to a pipe 42, which passes up through the table and is tapped into the air-drum 7. Pipe 40 terminates in a T-union 43 to which the nozzle 44 is attached. This union also has 120 attached thereto the flexible hose 45 which carries the sand suction-head 46.

The principle of sand ejection is as follows:

Air is admitted to pipe 40 from the pressure drum 7 by opening a valve 47, mechanism being provided at a point near the operator's stand for opening the valve which is adapted to operate automatically after the ware is seated on the revolving table, 130

as hereinafter described. Air in passing through the union and nozzle to the atmosphere creates a vacuum in hose 43, which causes the sand to be drawn into the hose and into the current of air passing through the union, and ejected through, and directed by, the nozzle onto the ware, all in a manner which is well understood. Various other sanding nozzle constructions may be employed and I do not wish to restrict the invention to any particular type of nozzle. These sanding nozzles are adapted to be moved automatically so as to direct the stream of sand to act on all portions of the revolving ware, and the air for the blast is automatically controlled.

In Fig. 7 the sanding nozzle is illustrated in full and dotted lines indicating the swing or movement of the nozzle to direct the sand to all portions interiorly of the globe. To accomplish this movement a stationary cam-track 48 is provided upon which the pipe 40 is adapted to travel, a roller 40^a surrounding the pipe to relieve the pipe of wear. This track is stationary and is detachable, and is made of various forms for various kinds of ware. The track as shown has a straight portion 48^a which maintains the nozzle at the correct angle to direct the sand, in the instance shown, to approximately half the height of the globe. As the table revolves the nozzle is carried off the straight portion and rides down the inclined end 48^b of the track to the position as shown in dotted lines, in which position it is held suspended at the swing-joint by an adjustable chain 49 for directing the sand at the right angle to operate on the remaining unsanded portion of the globe. The nozzle remains in this suspended position until the revolving table brings it in contact with the opposite inclined end 48^c of the cam-track whereupon it is brought again in position on the straight portion of the track. Completion of travel of the nozzle on the straight portion of the track completes the sanding operation. At or near this position, the air-blast for sanding is cut off automatically, and the ware elevated, and removed from the holder, and unsanded ware placed in the holder to be operated on. These operations take place as the table revolves, and when the unsanded ware is lowered into position, the table has moved so that the nozzle is again in suspended position, and the air is automatically turned on for the sanding operation. The mechanism for automatically controlling the sanding air comprises a bracket 50 located on the table near each ware position. To this bracket is attached a bell-crank 51, one arm of which connects by a rod 52 to an operating-arm 53 on the valve 47. This valve is a simple plug-valve or cutout cock and movement of the arm in one direction turns on the air, and the reverse movement

cuts the air off. The bell-crank has an arm 54 which is adapted to be engaged by tripper-wheels arranged in the path of the travel of the arm as the table revolves. The wheels are mounted on fixed brackets 55 attached to the machine. One of these wheels 56 is located in such position as to engage the arm of the bell-crank near the end of the travel of the nozzle over the straight portion of the track. The wheel being so positioned in respect to the arm as to cause the arm to be drawn under the wheel and depressed, the movement of the bell-crank at this time closes the valve 47 and shuts off air to the sanding nozzle. As the table continues to turn, new ware is inserted, and the holder lowered. The bell-crank having moved with the table is brought to a position where the arm 54 is engaged by the wheel 57. The arm at this position riding up over the wheel moves the arm of the valve to turn on the air for the beginning of the sanding operation.

From the foregoing description of the machine and its operation it will be seen that I have provided a machine which by its automatic operation greatly facilitates the handling of ware. The continuous, successive operation of removing the finished ware and replenishing the machine from a fixed position as the machine rotates results in a large saving of time and in increased output, as compared with the common practice of attending a row of separate machines in which the operator must walk to the different machines. Also, there are advantages in the invention by reason of the wide range of adjustment of the holder and support for the ware, and of the sanding mechanism, adapting the machine for various kinds of ware.

What I claim is:

1. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, a plurality of rotary ware supports carried on the table, means for rotating the supports to rotate the ware during the rotation of the table, sanding mechanism, and means for operating the sanding mechanism to sand the ware of each support separately throughout its movement on the table.

2. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, a plurality of rotary ware supports carried on the table, means for rotating the supports to rotate the ware during rotation of the table, sanding mechanisms one for each support, and means for operating the sanding mechanisms to direct sand to the ware throughout its movement on the table.

3. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, a plurality of rotary ware supports

carried on the table, means for rotating the supports to rotate the ware during rotation of the table, sanding mechanisms one for each support and means for successively operating the sanding mechanisms to direct sand to the ware during its movement on the table.

4. In a sand-blast machine for glassware or the like, the combination of a rotary ware table, a plurality of rotary ware supports carried on the table, means for rotating the supports to rotate the ware during rotation of the table, sanding mechanisms one for each support, means for successively operating the sanding mechanisms to direct sand to the ware throughout its movement on the table, and means controlled by movement of the table for successively removing the ware on completion of the sanding operation.

5. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, sanding mechanism, a plurality of rotary ware-supports on said table, mechanism operatively associated with said table for lowering the ware onto said supports to be acted on by the sand-blast, means for operating the sanding mechanism to direct sand onto the ware throughout its movement on the table, said means controlled by movement of the table, and means for operating said second mechanism for raising the ware from the supports at completion of the sanding operation.

6. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, sanding mechanism carried by the table, a plurality of rotary ware-supports on said table, reversibly operative mechanism for lowering the ware onto said supports to be acted on by the sand-blast, said mechanism including means for holding the ware down, means for operating the sanding mechanism to direct sand onto the ware throughout its movement on the table, said means controlled by the movement of the table, and connections between the table and said reversible mechanism for operating said mechanism to raise the ware from the supports at completion of the sanding operation.

7. In a sand-blast machine for glassware or the like, the combination of a rotary ware-table, a plurality of rotating ware-supports on said table, sanding mechanism adapted to direct sand to the ware as the table revolves, said mechanism controlled by the movement of the table, a holder to hold the ware on the support during the sanding operation, and automatic means for raising the holder to remove the ware at completion of the sanding operation, said automatic means controlled by the movement of the table.

8. In a sand-blast machine for glassware or the like, the combination of a continuously-rotating table, a plurality of continu-

ously-rotating ware-supports on said table, separate sanding mechanism for each support operatively connected to the table, a ware-holder for each support, and automatic means controlled by the movement of the table for operating the holders separately in succession to lower the ware on the support and to raise the ware from the support at the beginning and completion, respectively, of the sanding operation.

9. In a sand-blast machine for glassware or the like, the combination of a continuously-rotating table, a plurality of continuously-rotating ware-supports on said table, separate sanding mechanism for each support, mechanism for operating the sanding mechanism to sand the ware, a ware-holder for each support, and means controlled by the movement of the table for operating the holders separately in succession to lower the ware on the support and to raise the ware from the support at the beginning and completion, respectively, of the sanding operation.

10. In a sand-blast machine for glassware or the like, the combination of a continuously-rotating table, a plurality of continuously-rotating ware-supports on said table, separate sanding mechanism for each support, automatic means for operating the sanding mechanism to sand the ware, said means controlled by the movement of the table, a fluid-actuated ware-holder for each support, and automatic means controlled by the movement of the table for operating the holders separately in succession to lower the ware on the support and to raise the ware from the support at the beginning and completion, respectively, of the sanding operation.

11. In a sand-blast machine for glassware, the combination of a sand receptacle, a rotary table above the receptacle having a plurality of openings, supports on the table at the openings for rotatably supporting the ware in sanding position, dirigible sanding mechanism beneath each opening, means for rotating the table, and means for moving the sanding mechanism to direct the sand to the ware during the rotary movement of the table.

12. In a sand-blast machine for glassware, the combination of a sand receptacle, a rotary cover for the receptacle having a plurality of openings communicating with the interior, sanding mechanism within the receptacle, means for supporting the ware at the openings for sanding, means for rotating the cover to move the ware so as to be acted on by the sand-blast, and means for rotating the ware on its support during rotary movement of the table.

13. In a sand-blast machine for glassware or the like, the combination of a sand receptacle and a rotary cover therefor, a plurality

5 of ware-supports on said cover, said supports comprising a rotary ware-seat having an opening communicating with the interior of the receptacle, sanding mechanism within the receptacle, means for rotating the cover to successively move the ware into sanding position, means for operating the sanding mechanism to direct the sand to the ware during movement of the table, and means

for rotating the supports during rotary movement of the table.

In testimony whereof, I the said CHARLES F. MOTZ, have hereunto set my hand.

CHARLES F. MOTZ.

Witnesses:

JOHN F. WILL,
J. R. KELLER.