May 12, 1936. J. J. WANKO 2,040,720

GLASS POLISHING MACHINE

Filed Dec. 28, 1934 2 Sheets-Sheet 1

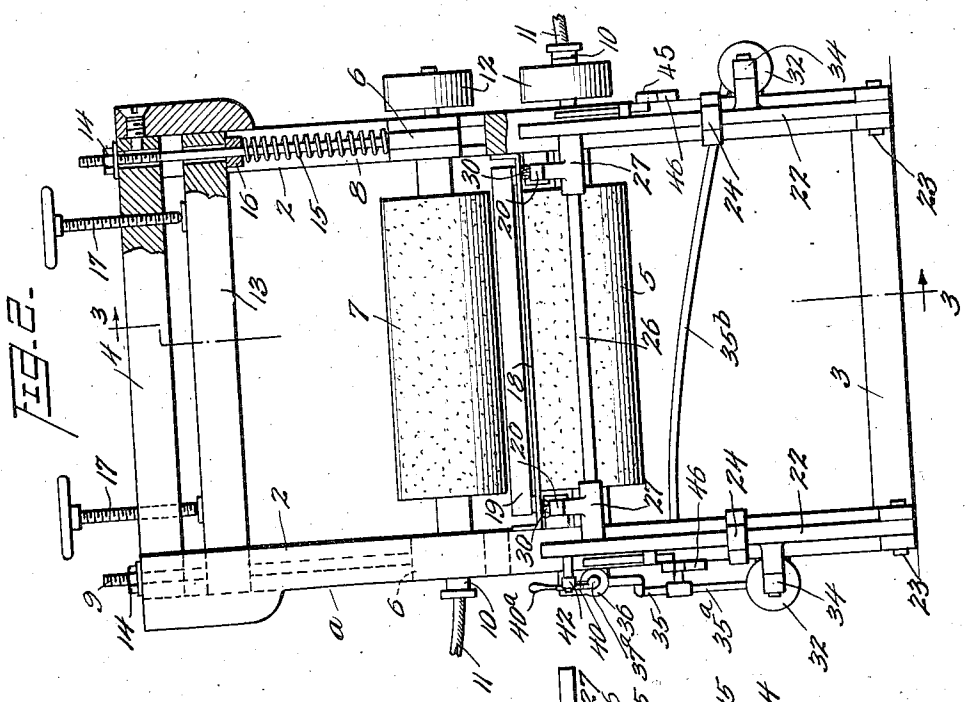


FIG. 2.

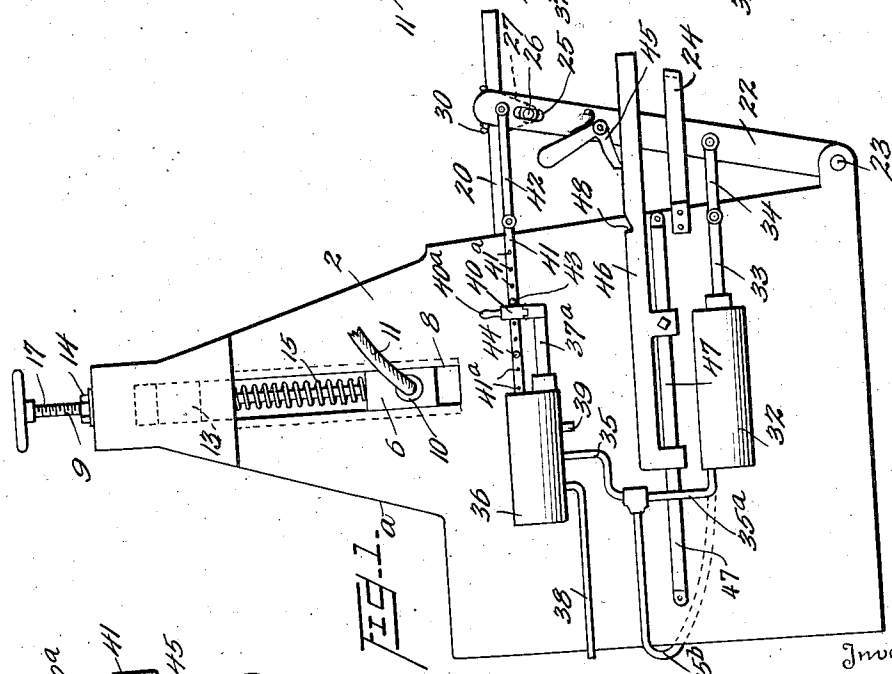


FIG. 1.

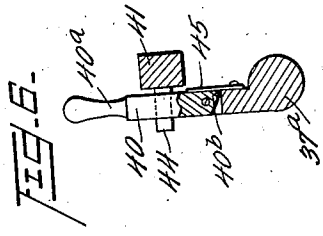


FIG. 6.

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GLASS POLISHING MACHINE

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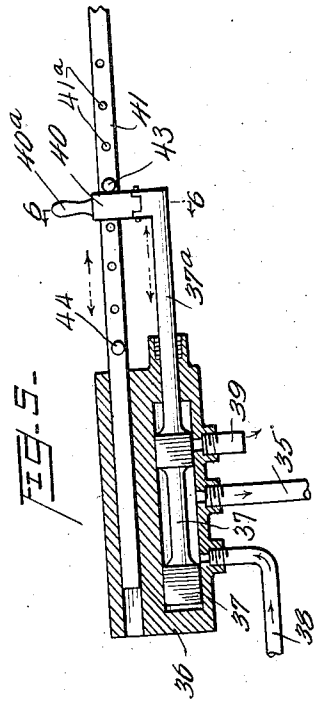


FIG. 5.

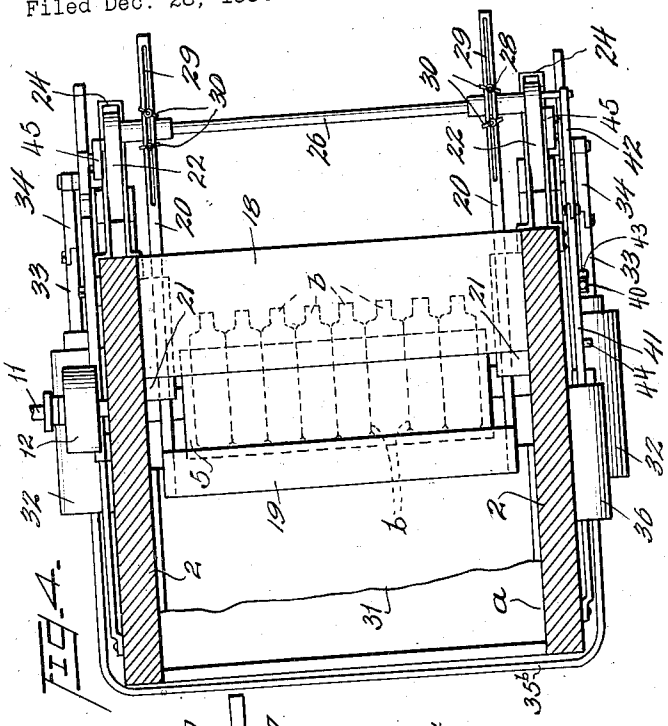


FIG. 4.

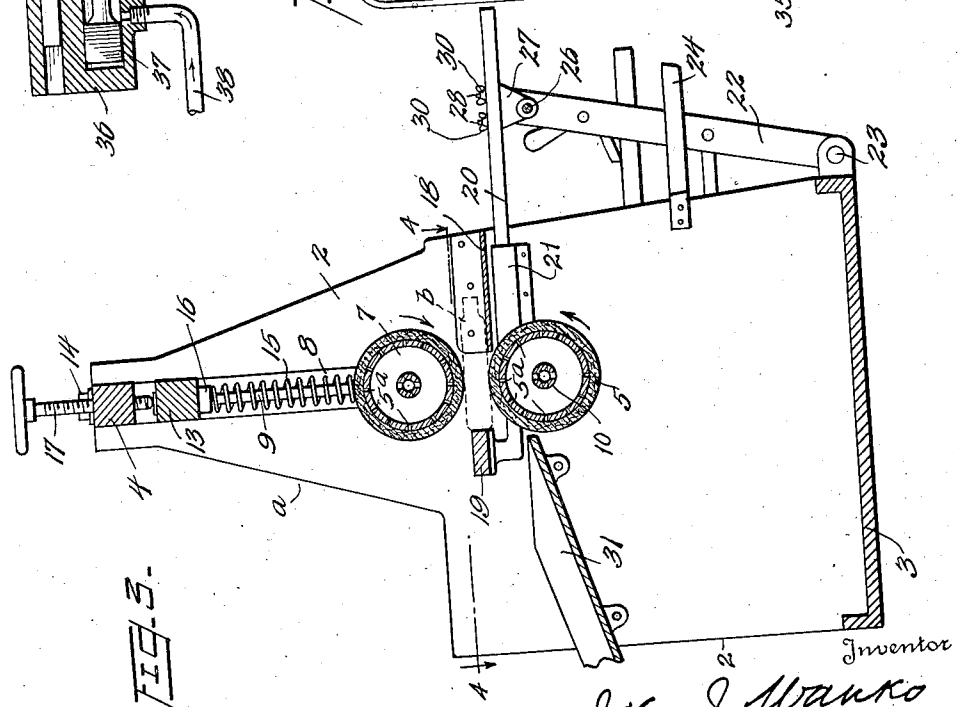


FIG. 3.

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2,040,720

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2,040,720

GLASS POLISHING MACHINE

John J. Wanko, Baltimore, Md.

Application December 28, 1934, Serial No. 759,563

10 Claims. (Cl. 51—80)

This invention relates to a machine for polishing glass articles and particularly glass bottles having opposed flattened sides, and the main purpose of the invention is to provide a machine by which the opposed surfaces of groups of such articles may be simultaneously operated upon and rapidly polished.

A further object of the invention is to provide a polishing mechanism which is adjustable to operate upon bottles or like articles of different lengths or to vary the linear extent of the polishing action on the article or articles being polished.

In the accompanying drawings,

Fig. 1 is a side elevation of a glass polishing machine constructed in accordance with the invention;

Fig. 2 is a front elevation of the same;

Fig. 3 is a vertical front-to-rear section through the machine, on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section taken substantially on line 4—4 of Fig. 3;

Fig. 5 is a longitudinal section through the valve casing, showing also adjacent parts of the valve shifting mechanism, and,

Fig. 6 is a detail section on line 6—6 of Fig. 5.

In the practical embodiment of my invention as herein disclosed I provide a polishing machine comprising a main frame *a* formed of spaced sides or uprights 2 suitably connected at their bottom portions to a supporting base 3 and suitably connected at their upper ends by a top cross bar 4.

Journaled in stationary bearings on the uprights 2 is a lower polishing roll 5, and journaled in movable bearings 6 is an upper polishing roll 7, arranged directly above and in spaced relation to the roll 5. The bearings 6 are fitted to slide in vertical guideways 8 in the uprights 2, and each bearing 6 is carried by a supporting and pressure regulating rod 9.

The rolls are hollow metal cylinders having fabric coverings and the cylinders are provided with perforations 5ª through which water may seep to keep the coverings moist. Water is admitted to the interior of the rolls through hollow perforated trunnions 10 to which flexible water pipes 11 are connected.

The shaft of each roll is provided at one end with a belt pulley 12 for driving the rolls simultaneously and at like speeds from a suitable source of power. As stated, the lower roll is journaled to rotate in fixed bearings, while the upper roll is journaled in the movable bearings 6 carried by the supporting and pressure regulating rods 9. These rods extend upwardly through openings in the top frame bar 4 and a vertically movable pressure regulating bar 13 arranged therebelow, and the upper ends of the rods are threaded to receive adjusting and supporting nuts 14 resting on the bar 4, whereby the rods may be adjusted to movably support and space the roll 7 with relation to the roll 5 as required for working action on glass articles of different thicknesses. The roll 7 is held with elastic pressure down against the surfaces of the glass articles by means of coiled springs 15 surrounding the rods 9 between the bearings 6 and abutments 16 slidably mounted on the rods between the upper ends of the springs and the pressure regulating bar 13. Adjusting and set screws 17 carried by the bar 4 are provided to engage the bar 13 and to adjust it to regulate the pressure of the springs on the bearings 6 to regulate and vary the working pressure of the roll 7 to any desired degree.

Disposed between and secured to the uprights 2 at the front of the frame is a stationary supporting and guide shelf or table 18, and mounted on the frame for coaction therewith is a carriage or slide comprising an abutment bar or head 19 carried by arms or bars 20 slidably mounted in guides 21 on the uprights 2. The bar or head 19, as shown, is arranged in rear of the table 18 and in a horizontal plane slightly above the plane of the surface of said table, while the arms 20 project therefrom toward the front of the frame and beneath the table.

Rocker arms or levers 22 are, as shown at 23, pivotally mounted at their lower ends to the uprights 2 at the front of the frame *a* and are guided and limited in their outward movement by guide brackets 24 fixed to the frame. At their upper ends the levers are formed with vertical slots 25 through which the ends of a cross-rod 26 extend. This cross-rod is supported in brackets 27 which are adjustably connected to the guide bars 20. These brackets have projecting therefrom adjusting bolts 28 which extend upward through and are slidably adjustable in longitudinal slots 29 formed in the arms 20, said bolts being fitted with wing-nuts 30 for tightening and loosening the brackets. By the devices described the abutment bar 19 of the carriage may be adjusted with respect to the rocker arms and to the shelf or table 18.

In practice, the bottles *b* to be polished are laid on the shelf 18, the bottoms of the bottles being adjacent the gap between the rolls, and the rocker arms and carriage are pulled forwardly, as hereinafter explained, until the abut-

ment bar 19 is close to the polishing rolls which are in constant rotation. The bottles are then pushed into the space between the rolls and the friction of the rolls moves the bottles against the abutment bar and the latter move the carriage rearwardly, this movement of the carriage causing the rocker levers 22 to rock rearwardly. The extent of movement is controlled, as hereinafter explained, so that the upper ends of the bottles do not pass off the table, and at the end of the rearward movement the rocker arm, the carriage and the bottles are moved forwardly by power applied to the levers, and this back and forth movement is continued until both sides of the bottles are polished by the opposing rolls. By a manual operation, the power tending to move the levers and carriage forward is then cut off and the carriage is allowed to move backward far enough to permit the polished bottles to pass from between the rolls and drop down out of engagement with the abutment bar 19 on to an inclined slide 31 which conducts them away from the rolls and the carriage.

The carriage and the bottles which are moved rearwardly by the frictional pressure of the polishing rolls may be moved in the opposite direction by any suitable power operated means. In the drawing I have shown mechanism for this purpose adapted to be operated by compressed air or other fluid pressure. Motor cylinders 32 having pistons therein are mounted on the uprights 2 and piston rods 33, connected to the pistons, are coupled to the levers 22 by connecting rods 34. A pipe 35 leads from the center of a valve casing 36, and branch pipes 35a and 35b extend to the rear ends of the cylinders 32. A D-type slide valve 37 is arranged within the valve casing. Fluid under pressure is admitted to the valve casing through a supply pipe 38 and the fluid is exhausted from the casing through an exhaust outlet 39. Fig. 5 shows the position of the valve for supply of fluid to the motor cylinders, in which position the ports to pipes 35 and 36 are uncovered and the exhaust outlet 39 is closed. The valve is movable to the right from this position to a position in which it closes the port to pipe 35 and opens communication between pipes 35 and 39 for an exhaust action. The valve is adapted to be controlled by the forward and backward movements of the carriage and levers 22 and to control the forward movement or stroke thereof. To this end the valve stem 37a has pivotally mounted thereon for lateral swinging movement a tappet arm 40 which is provided with a handle 40a whereby it may be swung toward and from a valve actuating bar 41 slidably supported by the valve casing and operatively connected to the adjacent lever by a link or connecting rod 42. This bar is provided with a series of regularly spaced openings 41a to receive tappet pins 43 and 44 which may be suitably engaged with the openings to vary their spaced relationship. These pins are adapted for engagement with the tappet arm 40, when the latter is positioned for coaction therewith, to automatically shift the valve to feed and exhaust positions at the ends of the backward and forward strokes, respectively, of the carriage and operating levers. It will be evident that the bar 41 travels with the carriage and levers on their backward and forward strokes and that the pins 43 and 44 may be set to engage the arm 40 to slide the valve to feed and exhaust positions, respectively, at the ends of these respective strokes, and that by adjusting the tappet pins the stroke of the carriage may be lengthened or shortened to suit bottles of different lengths.

The pivotal mounting of the arm 40 allows it to be swung out of the path of the pins so that the valve will not be operated thereby. To enable the arm 40 to be held in an inoperative position the arm may be provided with a cam portion 40b for engagement with a retaining spring 45.

After one group of bottles has been polished, it is necessary to discharge this group from the machine. To accomplish this, the operator takes hold of the levers 22 or the cross rod 26 and holds the levers in their forward position, and while thus held, swings the tappet arm 40 to one side out of the path of the tappet pins. In the forward position of the levers, the valve is in the position to which it has been moved by the tappet pin 44,—that is the position where the inlet port to which the supply pipe 35 is connected is closed and the port to which the exhaust pipe 39 is connected is open. The operator now allows the levers and carriage and tappet bar 41, which is connected to one of said levers, to move backward far enough to permit the bottles to pass entirely from the shelf 18 and through the space between the polishing rolls, when the bottoms of the bottles will drop out of engagement with the bar 19 of the carriage and the bottles will be deposited on the slide 31.

After the bottles have been discharged there is no force tending to move the carriage either rearwardly or forwardly. The operator now moves the rocker levers and carriage forwardly and another row of bottles is placed on the shelf 18, out of engagement with the polishing rolls. The tappet arm 40 is returned to its operative position between the pins 43 and 44 and the operator then pushes the row of bottles rearwardly on the shelf until they are engaged by the polishing rolls. The rolls carry the bottles against the bar 14 and the carriage is thereby moved rearwardly causing the rocker arms and the tappet rod 41 also to move rearwardly until the pin 43, engaging the tappet arm 40, moves the valve to the position shown in Fig. 5, wherein fluid will be admitted to the motor cylinders and rocker levers, carriage and tappet rod will be moved forwardly. The tappet pin 44, engaging the tappet arm during the forward stroke, will cause the valve to be shifted to cut off the fluid supply to the cylinders and to open the latter to the exhaust, and thereupon the friction of the polishing rolls applied to the bottles will cause the bottles, carriage, rocker levers and tappet rod to move rearwardly. This back and forth movement of the bottles will continue automatically until the operator proceeds, as before described, to cause the discharge of the bottles.

It will be seen that by the apparatus described, a large number of bottles may be polished on both sides simultaneously, the number depending upon the width of the bottles and the shelf and the length of the polishing rolls. Also, by means of the adjustable tappet pins, the length of the stroke of the carriage may be adjusted so that long or short areas on large bottles may be polished, or long or short bottles may be polished throughout the lengths of their flat sides, as may be desired.

By admitting water to the rolls the fabric is kept moist so that it holds the polishing mate-

rial better than if the fabric were dry, and the moisture also keeps the bottles relatively cool.

I provide a safety device, not essential to the normal working of the apparatus, to prevent the carriage from being moved rearwardly far enough to discharge the bottles in case of failure of the fluid pressure or any derangement of the apparatus which would permit the polishing rolls to carry the bottles and carriage backward further than the distance determined by the proper setting of the valve operating mechanism. This safety device, shown in Fig. 1, consists of a dog **45** pivotally mounted on one of the levers **22** and having its free end normally resting on a horizontal stop bar **46** which is adjustable horizontally on a guide bar **47**, secured to a side frame of the machine. The stop bar has a notch **48** on its upper side adapted to be engaged by the dog. During the normal working of the apparatus the dog rides back and forth upon the stop bar in advance of the notch; but if by any derangement of the apparatus the levers **22** and the carriage are moved rearwardly a short distance further than they should go in the normal working of the apparatus, the dog will enter the notch in the bar and prevent further backward movement of said parts. By adjusting the stop bar forwardly or backwardly, the notch therein can be adjusted accordingly so that the dog will enter the notch sooner or later in the backward travel of the carriage, this adjustment being desirable because in polishing short bottles, the travel of the carriage is shorter than when long bottles are being polished.

When the operator wishes to discharge the bottles from the rolls and carriage, by allowing the carriage to move backward a greater distance than the length of the polishing strokes, as hereinbefore explained, he may, where the safety device is present, rock the dog out of engagement with the stop bar so that it passes beyond the notch without engaging it. This safety mechanism, shown in details on one side of the machine in Fig. 1, may be duplicated on the opposite side of the machine if desired, and it is so shown in Fig. 2.

What I claim is:

1. In a bottle polishing machine, the combination of spaced, superposed polishing rolls, and supporting means comprising a stationary supporting element at one side of the space between the rolls upon which the bottles are slidable, and a movable abutment element at the opposite side of the space between the rolls adapted to be engaged by the ends of the bottles, said movable element being adjustable with relation to the stationary element to provide a variable work gap therebetween and being movable by the traction of the rolls applied to the bottles in the direction away from the stationary supporting element.

2. In a glass polishing machine, the combination of a pair of superposed, spaced polishing rolls, a stationary article support at one side of the rolls, an article engaging abutment at the opposite side of the rolls movable toward and from said support and movable in the direction away from said support with the article under traction of the rolls, a swinging element for permitting such movement of the abutment and moving the abutment in the reverse direction, and power means for imparting motion to said swinging element to move the abutment in the latter-named direction.

3. In a glass polishing machine, the combination of spaced, superposed polishing rolls, a stationary article support at one side of the rolls, an abutment at the opposite side of the rolls against which an end of the article is adapted to bear, said abutment being movable toward and from said support and with the article in the direction away from said support under traction of the rolls, a swinging frame connected to said abutment, a fluid pressure operated power mechanism for swinging said frame in the direction to move the abutment toward the support, and a valve mechanism automatically controlled in action by the swinging movements of the frame for admitting and cutting off the supply of fluid pressure to the power mechanism alternately.

4. A machine for polishing bottles comprising spaced superposed polishing rolls rotatable in opposite directions and means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary shelf and a movable abutment bar at opposite sides of the space between the rolls and extending parallel with the rolls, the bottles and bar being movable in a direction away from the shelf by the traction of the rolls on the bottles, and means for moving the bar and bottles in the reverse direction intermittently.

5. A machine for polishing bottles comprising spaced superposed polishing rolls rotatable in opposite directions, means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary shelf and a movable abutment bar at opposite sides of the space between the rolls and extending parallel with the rolls, the bottles and bar being movable in a direction away from the shelf by the traction of the rolls on the bottles, and means for limiting the movement of the bar and bottles in said direction and for moving the same in the reverse direction and to the same extent intermittently.

6. A machine for polishing bottles comprising spaced superposed polishing rolls rotatable in opposite directions, means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary shelf and a movable abutment bar at opposite sides of the space between the rolls and extending parallel with the rolls, the bottles and bar being movable in a direction away from the shelf by the traction of the rolls on the bottles, means for limiting the movement of the bar and bottles in said direction and for moving the same in the reverse direction and to the same extent intermittently and means for permitting a further movement of the bar in the first-mentioned direction to cause the discharge of the bottles.

7. A machine for polishing bottles comprising spaced superposed polishing rolls rotatable in opposite directions, means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary shelf and a movable abutment bar at opposite sides of the space between the rolls and extending parallel with the rolls, the bottles and bar being movable in a direction away from the shelf by the traction of the rolls on the bottles, power operated means for automatically limiting the movement of the bar and bottles in said direction and for moving the same in the reverse direction and to the same extent intermittently, and a dog for preventing movement of

the bar and bottles in the first mentioned direction in case of failure of said power operated means, during normal working of the apparatus.

8. A machine for polishing bottles comprising spaced superposed polishing rolls rotatable in opposite directions, means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary shelf and a movable abutment bar at opposite sides of the space between the rolls and extending parallel with the rolls, the bottles and bar being movable in a direction away from the shelf by the traction of the rolls on the bottles, means operated by fluid pressure for automatically limiting the movement of the bar and bottles in said direction and for moving the same in the reverse direction and to the same extent intermittently, and means for cutting off the fluid pressure and permitting an extended movement of the bar in the first-mentioned direction to cause the discharge of the bottles.

9. A machine for polishing bottles comprising superposed polishing rolls, rotatable in opposite directions, and means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary support at one side of the rolls upon which the bottles are slidable and a movable abutment at the opposite side of the rolls against which the ends of the bottles are adapted to be pressed by the traction of the rolls, and means for permitting a limited movement of the abutment away from said support and for moving it to the same extent in the reverse direction, intermittently.

10. A machine for polishing bottles comprising superposed polishing rolls, rotatable in opposite directions, and means for supporting a row of bottles for endwise movement back and forth between said rolls with the opposite sides of the bottles engaged by the rolls, comprising a stationary support at one side of the rolls upon which the bottles are slidable and a movable abutment at the opposite side of the rolls against which the ends of the bottles are adapted to be pressed by the traction of the rolls, means for permitting a limited movement of the abutment away from said support and for moving it to the same extent in the reverse direction, intermittently, and means for permitting a further movement of the abutment in the first-mentioned direction to cause the discharge of the bottles.

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