Jan. 25, 1955 W. A. MEIER 2,700,255

GLASSWARE POLISHING MACHINE

Filed Feb. 10, 1951 2 Sheets-Sheet 1

Fig. 1.

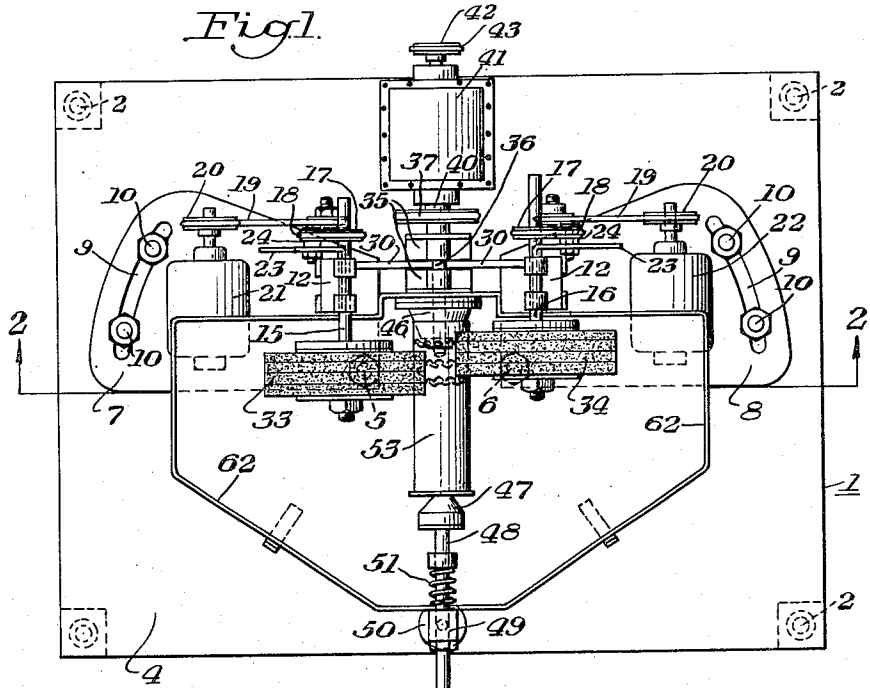
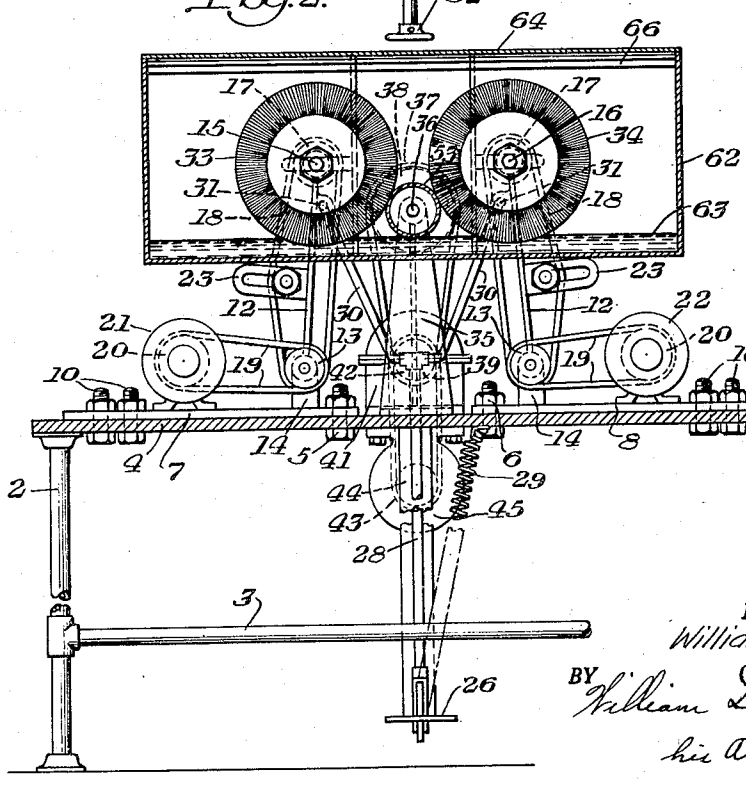


Fig. 2.



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Fig. 3.

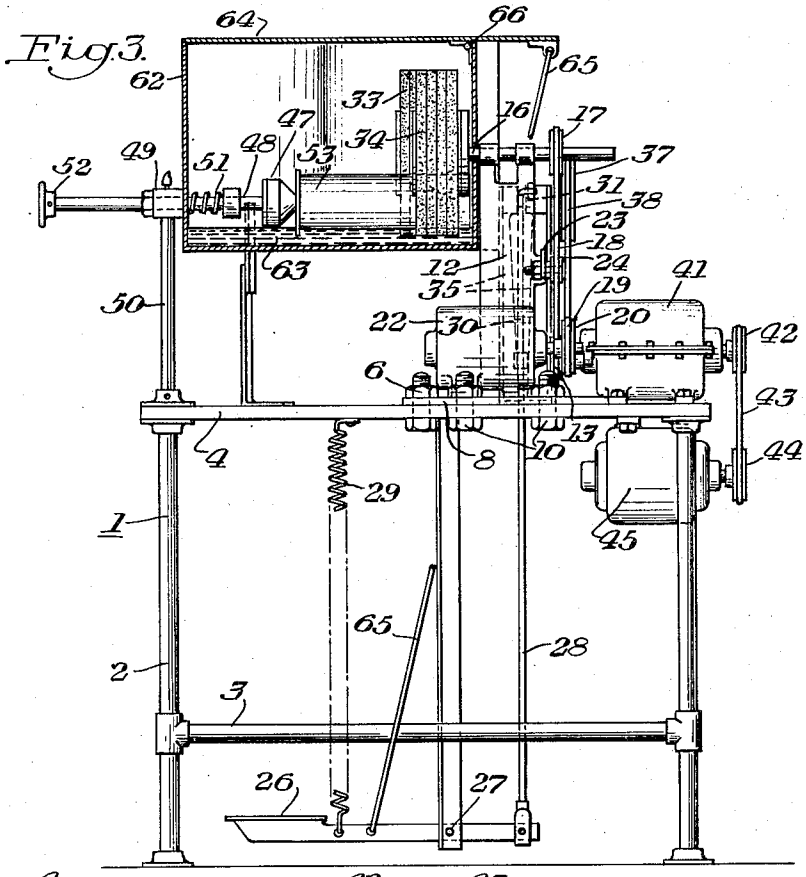


Fig. 4.

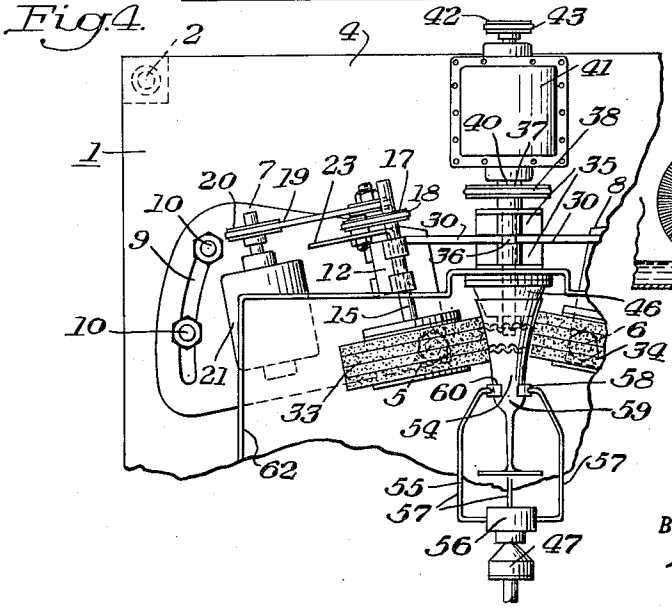
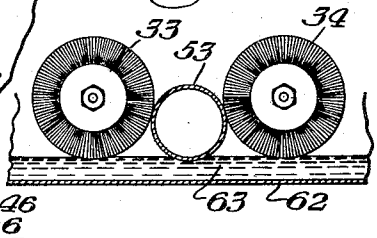


Fig. 5.



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GLASSWARE POLISHING MACHINE

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Application February 10, 1951, Serial No. 210,343

6 Claims. (Cl. 51—89)

This invention relates generally to apparatus for polishing glassware and more particularly to apparatus for polishing the gray cut surface on the glass article by means of a compound and a brush.

There are several modes of polishing the gray cut surface of an ornamental design on glass articles. The oldest method is to manually buff the gray cut surface of the ornamental design with a rouge polishing compound. Glass articles have been held in the hand and polished in this manner for many, many years.

The next development for the polishing of the gray cut surface in the ornamental designs of glass articles was by acid. In this polishing process the gray cut surface of the ornamental design is lowered into a hydrofluoric acid bath and permitted to stay therein for a sufficient length of time until the acid has an opportunity to eat away the rough edges and thereby polish the gray cut surface. This process is extremely expensive owing to the fact that a high percentage of the ware must be buffed by hand in order to eliminate the acid marks and other defects created by this process. Again the handling of glassware in bulk produces considerable breakage and thereby creating a considerable loss.

A third mode of polishing the gray cut surface of glassware is by the application of a flame which is sufficiently wide to encompass the gray cut design and is of sufficient intensity to melt the finite particles of the glass forming the gray cut surface and melt them causing them to become transparent.

The apparatus of this invention returns to the old and original teaching of polishing with rouge but automatically in a machine by means of a bristle brush which is mounted in such a way as to provide a materially increased production over that of any of the prior modes; the production time being taken from the time that the glassware is inserted in the machine and is subsequently washed and packed.

In the machine comprising this invention the article is supported by a chuck which is rotatably mounted within a container. A plurality of brushes are mounted on rotary shafts within the container and are adjustable so that they will engage the rotary glass article and particularly the gray cut surface of the ornamental design. Each brush is adjustable so that it will engage a portion of the article and, if it is necessary to polish the entire surface of the article, the brushes can be overlapped and thus cover the whole of the surface of the article at one time. If the design is small all of the brushes may be set to cover it and thus polish the ware in a shorter length of time.

The container holds the polishing compound which is preferably in the form of a liquid with the rouge in suspension and having the character of a mud. The level of the polishing compound may be such that it will be engaged by the brushes when they are in brushing engagement with the article, but when they are retracted from engaging the article they are lifted out of the polishing compound. This saves the compound as well as the brush.

Some articles may be sufficiently large in diameter so that their surface rotates in contact with the polishing compound and thereby aids in carrying it around when being engaged by the brush or brushes. Thus the brush is caused to dip into the polishing compound and then engage the glass article to convey the compound to the article and brush it at the same time. The brushes and the ware itself continuously dip into the compound at a

relatively high speed which provides a materially faster polishing process than that known and formerly used by hand polishing wherein the polishing compound was placed on the glass or dropped on the wheel. In the old manual process the article had to be taken out of engagement with the wheel while additional polishing compound was added.

One of the important features of this invention is the selection of a materially slower peripheral speed of the glass article than that of the brush. This aids in determining the polishing time.

Another object is the provision of a holder for glass article stemware which enables the same to be polished in this machine without changing the article holding chuck.

Another object is the provision of apparatus for polishing the gray cut surface of ornamental designs on glass articles by moving the article and simultaneously moving a plurality of brushes through the polishing compound and then directly in engagement with the design on the glass article to polish the same and wherein the rotary movement of the glass article is materially lower than the movement of the brush in contact with the glass article.

Another object is the provision of a machine for polishing the gray cut surface of ornamental designs on glassware wherein rotary brushes are employed to convey a polishing compound on to a rotating article and which brushes may be retracted from the position of engagement with the article and out of engagement with the polishing compound when it is desired to remove and replace the article being polished.

Other objects and advantages appear hereinafter in the following description and claims.

The accompanying drawings show for the purpose of exemplification without limiting the invention or claims thereto, certain practical embodiments of the invention wherein:

Fig. 1 is a top plan view of a polishing machine set and adjusted for polishing a substantially cylindrical wall of a glass tumbler such as shown.

Fig. 2 is a view in vertical section of the structure as taken along lines 2—2 of Fig. 1.

Fig. 3 is a side elevation of the structure shown in Fig. 1 with the container shown in section.

Fig. 4 is a partial plan view illustrating the machine adjusted for polishing a frusto conical surface such as a stem goblet.

Fig. 5 is a view in reduced scale showing the glass article together with the brushes in engagement with the polishing compound.

With reference to the structure shown in Figs. 1 to 3, the glass polishing machine is mounted on the table or base 1 which comprises the legs 2 and the cross members 3 together with the table top 4. This table is preferably built with a steel table top and pipe legs to enable ready adjustment of the polishing mechanism relative to the shop in which it operates. The table is provided with spaced openings to receive the pivot bolts 5 and 6 which pivotally support the sectors 7 and 8. Each of the sectors 7 and 8 is provided with a slot 9 for receiving the clamping bolts 10 of which two are shown.

Each of plate sectors 7 and 8 supports the motors 21 and 22 respectively. An upwardly extending hinged frame 12 is provided for each sector. Each frame 12 is hingedly supported on the shafts on which the double grooved pulleys 13 rotate. These shafts are supported by the bearing stands 14 on the top surface of each of the sector plates. The upper end of each frame 12 supports the shafts 15 and 16 which are provided with the pulleys 17 that are connected with their respective pulley 13 by the V-belts 18. The other groove of the pulleys 13 has the V-belts 19 connected with the pulleys 20 on their respective shafts of the motors 21 and 22. Thus the motors 21 and 22 drive the respective shafts 15 and 16 on the upper end of the hinged frames. These motors are arranged to rotate these shafts in either direction.

Each hinged frame 12 is provided with an outwardly projecting bracket 23 having an idler pulley 24 adjustably mounted thereon and which will engage their respective

belts 18. The upstanding frames 12 being pivotally supported at their lower ends can move outwardly through an arc away from each other. This movement of the upstanding frames is obtained by means of the foot treadle 26 which is pivoted to the stand, as indicated at 27, and has a reach rod 28 connected to its inner end and a spring 29 connected to its forward end. The spring 29 retains the foot treadle 26 in its upward position and when the foot treadle 26 is depressed the reach rod 28 moves upwardly causing the links 30 to move the frames 12 away from each other. The lower ends of the links 30 are pivoted together and to the upper end of the rod 28 and at their upper ends to the respective upstanding frames 12 as indicated at 31. Thus any upward movement of the reach rod 28 causes the links to move the frames 12 outwardly and away from each other. This movement of the frames 12 moves the shafts 15 and 16 away from each other.

Each of the shafts 15 and 16 has reed brush members 33 and 34 mounted thereon. Each of these brush members is preferably made up of a series of small circular brushes enabling one to make each brush larger or smaller depending on the size and extent of the ornamental design to be polished. A single wide brush may be employed in place of the series of smaller narrower brushes.

The upstanding bracket 35 at the rear of the machine is supported on the table 4 and has journaled at its upper end the shaft 36 which has the pulley 37 on its outer end that is arranged to receive the belt 38 that extends around the pulley 39 on the shaft 40 of the speed reducer 41. The other end of the speed reducer 41 is provided with a pulley 42 and is connected by means of the belt 43 to a similar pulley 44 on the motor 45 mounted on the underside of the table top 4. This is a variable motor speed drive. Thus the motor 45 drives the shaft 36 at a reduced speed, whereas the motors 21 and 22 provide substantially a direct drive to the corresponding shafts 15 and 16 to rotate the brushes 33 and 34 at a high rate of speed. Even though the brushes 33 and 34 are ordinarily larger in diameter than the ware being polished, the peripheral speed of the brush is quite high and is always materially higher than that of the ware itself.

The shaft 36 extends forwardly between the shafts 15 and 16 and is provided with a chuck member which is conical as shown at 46. Aligned with the chuck member 46 is an opposed chuck member 47 that is supported on the end of the rotary shaft 48 mounted in the bearing 49 at the upper end of the standard 50. The shaft 48 is also slidable longitudinally in the bearing 49 and is retained in its inwardmost position by means of the spring 51. A handle 52 is provided to retract the chuck part 47 and compress the spring 51 to permit the removal of glass articles such as the tumbler 53 from between the chuck members or to replace or change articles.

In view of the fact that when the foot treadle 26 is released the brushes 33 and 34 are pressed against the surface of the cylindrical tumbler and the brushes are located on the shafts 15 and 16 to place the brush 33 at a different position than that of the brush 34 and permit the whole of the design to be polished at one and the same time. If the design extended to the rim of the tumbler, the brush 34 would likewise be extended farther to the rim. And, if the design extended farther down the tumbler, the brush 33 would likewise be moved farther along the axis of the tumbler. However it is preferable to permit the brushes to overlap and, if they cannot overlap, it is better to add more sections to each brush and make it sufficiently wide to cover the whole of the design on the article being polished.

When the article is changed to a frusto conical shape, such as shown in Fig. 4 at 54, the sector plates 7 and 8 are swung to different adjusted angular positions so that the shafts 15 and 16 will present their brushes substantially normal to the surface which they are polishing. In view of the fact that the frusto conical surface at 54 is a short-stemmed goblet it is necessary to use the holder member 55 in order to support the short stemmed goblet on the chuck member 46. The holder 55 consists of a base member 56 having a center hole for receiving the chuck member 47. This holder 55 is provided with three arms 57 which extend to the other end of the holder 55 and are connected by a ring 58 which is broken by the slot 59 for receiving the narrow portion of the stem of the goblet. The interior of the ring may be padded with rubber as indicated at 60.

A container, such as indicated at 62, is shown to extend under the shafts 15, 16 and 36 and is preferably closely adjacent to the brushes 33 and 34 so that it will contain a small amount of polishing liquid or emulsion such as indicated at 63 and still touch the brushes. The container 62 is provided with a hinged lid 64 that may be raised to permit the operator to insert or remove glassware from between the chuck parts 46 and 47.

The lid 64 of the container is preferably hinged in the rear and, when the foot treadle 26 is depressed, the rod 65, which is connected to an extension on the top of the lid 64 and to the foot treadle 26 forwardly of the pivot 27, will be drawn downwardly and thus raise the lid on the hinges indicated at 66. Thus by actuating the foot treadle 26 one may automatically raise the lid and retract both brushes from engagement with the glass article that is mounted in the chuck.

The upwardly extending frames 12 which pivotally support the brushes to swing in their respective arcs is likewise sufficient to withdraw the perimetral surface of the brushes out of the compound 63 within the container 62.

In Fig. 5 the brushes 33 and 34 as well as the article 53 are shown to have their lower perimetral portions immersed in the polishing liquid 63. In other words the glass article may be of such diameter or the shaft 36 may lowered to permit the surface of the glass article to enter the polishing compound and thus three members will be continuously supplying compound to the surface of the glass as it is being brushed.

It has been discovered that repeated application of these reed brushes will produce a quick and relatively inexpensive polished glassware. It is believed that the continued supply of the glass polishing compound by these brushes at the point where the reeds of the brush engage and wipe the surface of the glass produces a better polish after a predetermined length of time than any of the other known processes. The old process of polishing a design by rouge paste could not be practiced by the constant supply of the rouge paste to the surface of the glass. This is practically impossible and it was necessary for the artisan to follow the design in polishing the surfaces rather than to polish a zone over the surface of the glass article which includes the whole of the design.

In actual operation this polishing machine permits one to polish a materially greater number of glassware in a shorter period of time for a relatively lower expenditure than any other process known. The saving in polishing glassware in this manner is approximately forty-five cents per dozen over that of any known process, which is a material factor in the art. Again there is no repair work required on glass articles polished in this manner which is required in almost all instances under the acid polishing process.

I claim:

1. A glass article polishing machine comprising a base, a container mounted on said base and holding a glass polishing compound, a glass article chuck mounted for rotation on said base to support a glass article to be polished in said container, a plate mounted on said base, an upstanding frame pivotally supported on said plate, a rotary shaft mounted on said frame, brush means on said shaft, a biased lever pivoted to said base and connected to swing said frame to maintain the rotary brush means in the compound and in polishing engagement with the glass article, and a foot treadle on said lever when depressed to retract said frame and withdraw said brush means from the compound and out of engagement with the glass article.

2. The structure of claim 1 characterized in that said plate means is adjustably attached to said base to orient the face of the brush means relative to the surface of the glass article.

3. The structure of claim 1 which also includes a lid to cover said brush means, a hinge supporting said lid on said container, and a link connecting said lever and said lid to open said lid when said foot treadle is depressed.

4. A glass article polishing machine comprising a base, a container with a glass polishing compound therein supported on said base, a chuck mounted on said base for

rotatably supporting a glass article having gray cut surfaces on a given axis adjacent the container, means for rotating said chuck to revolve the glass article, independently mounted shaft means supported on said base above said axis and on each side of said chuck, and a bristle brush on each shaft means mounted to pick up the compound from said container and engage the surface of the rotating glass article to polish the same and eliminate the gray cut surfaces.

5. A glass article polishing machine comprising a base, a container with a glass polishing compound therein mounted on said base, a rotary chuck mounted on said base for supporting a glass article having gray cut surfaces for polishing, rotary shaft means having bristle brush means mounted thereon for engagement with the glass article to polish the same, a spring biased support mounted on said base for said rotary shaft means, and lever mechanism pivoted on said base to swing said rotary shaft means and simultaneously retract the bristle brush means from engagement with the glass article and said compound.

6. A glass article polishing machine comprising a base, a rotary chuck mounted on said base for supporting a glass article member having gray cut surfaces for polishing with its rotary axis in a substantially horizontal plane, rotary shaft means having a bristle brush member to engage the glass article member and polish the same, a support mounted on said base holding the rotary shaft means above the rotary axis of the glass article member, a container carried by said base below the glass article member for holding polishing compound in contact with said

bristle brush member, and means carried by said base to swing a selected one of said members out of engagement with the other member and out of contact with the polishing compound.

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