

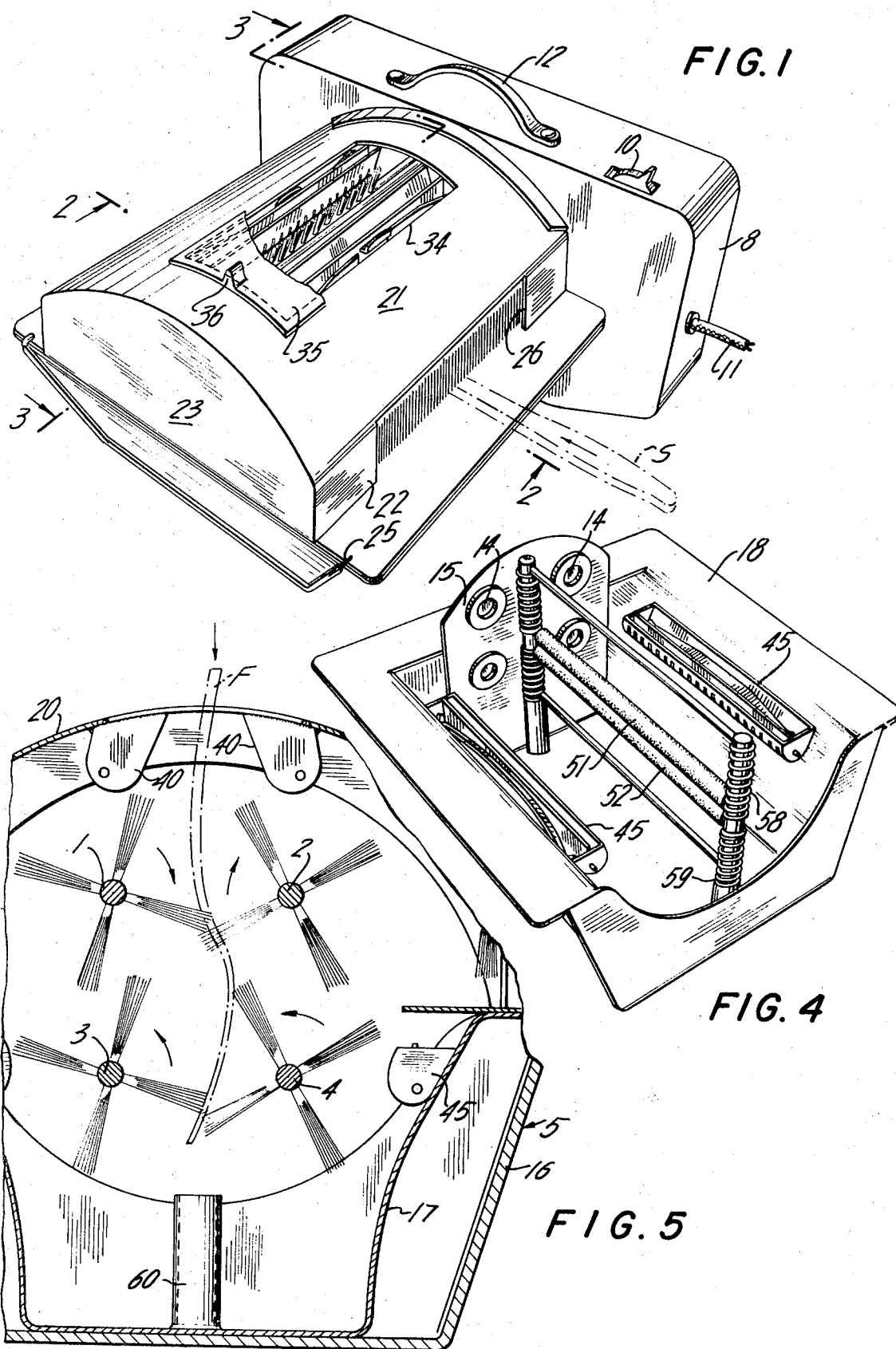
Dec. 29, 1970

E. DEJESA
POLISHING MACHINE

3,550,176

Filed May 26, 1969

3 Sheets-Sheet 1



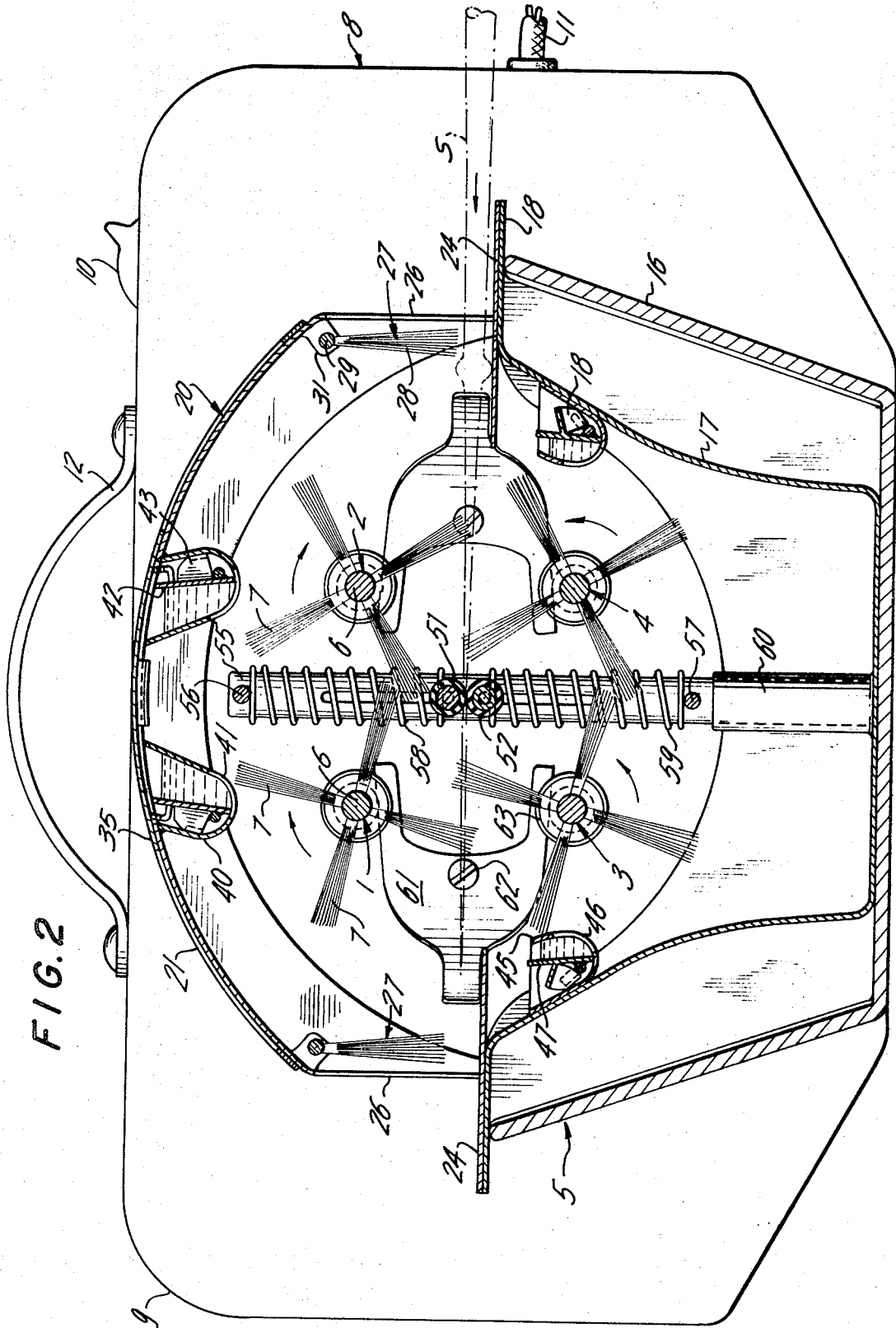
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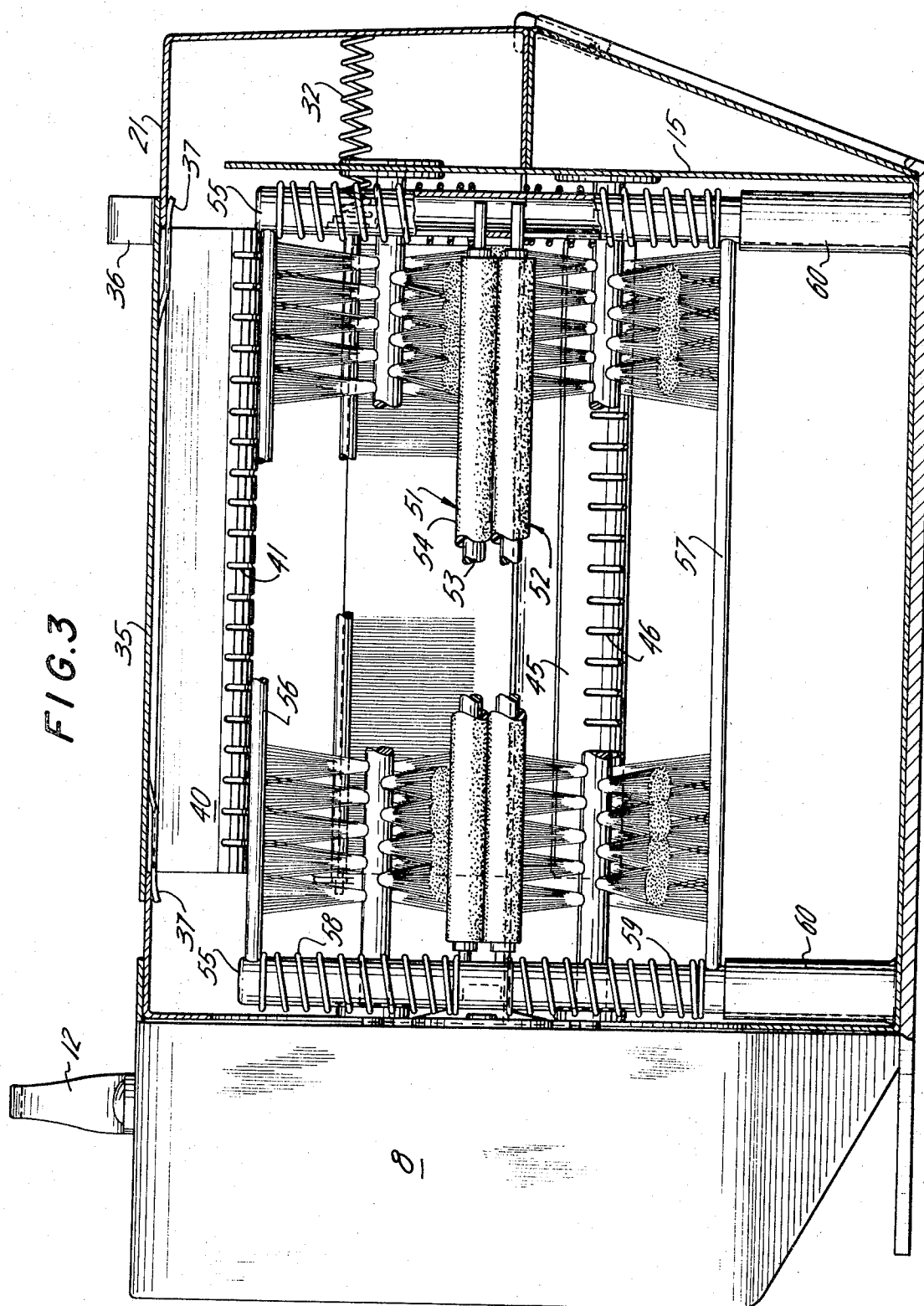
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POLISHING MACHINE

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11 Claims

ABSTRACT OF THE DISCLOSURE

A polishing machine particularly for silverware comprises four rotary brushes arranged in a square pattern with a pair of upper brushes above a like pair of lower brushes. Parallel axes of the brushes are spaced so that the bristles on each brush overlap with the horizontally and vertically adjacent brushes. The brushes are enclosed in a housing provided with openings for feeding silverware between upper and lower brushes and also vertically down between the horizontally disposed brushes. Perforate troughs feed paste polish to the tips of each brush.

The present invention relates to a polishing machine particularly suitable for polishing silverware.

The polishing machine in accordance with the invention is suitable for home use and can also advantageously be used for schools, restaurants, hotels and other eating places.

The polishing of silverware by hand is a tedious, messy and time-consuming job. It is a job that most housewives would like to avoid but it is becoming more and more difficult to find, or to be able to afford, servants who are willing to polish silver or are capable of doing it properly. Likewise, in schools, hotels, restaurants and other eating places it is difficult and expensive to keep the silverware polished.

It is accordingly an object of the present invention to provide an electrically operated polishing machine which will polish silverware quickly and easily so as to avoid the time and work heretofore required and likewise avoid the mess that was usually incident to silver polishing.

While the silver polishing machine in accordance with the invention has sufficient capacity to make it suitable for use in schools, restaurants, hotels and other public eating places, it is sufficiently small, compact, inexpensive and easy to use so that it is also suitable for household use.

The nature and advantages of the invention will be more fully understood from the following description of a preferred embodiment of the invention illustrated by way of example in the accompanying drawings in which:

FIG. 1 is a perspective view of a polishing machine in accordance with the invention;

FIG. 2 is a somewhat enlarged cross section taken approximately on the line 2—2 in FIG. 1;

FIG. 3 is a longitudinal sectional taken approximately on the line 3—3 in FIG. 1;

FIG. 4 is a schematic perspective view of a portion of the machine illustrating in particular guiding mechanism for silverware to be polished and,

FIG. 5 is a partial cross section similar to FIG. 2 but showing a different mode of use of the machine.

The polishing machine shown by way of example in the drawings comprises four rotary brushes 1, 2, 3 and 4 rotatably mounted in a suitable casing or housing 5. Each of the brushes comprises a shaft 6 and bristles 7 radiating from the shaft. The bristles are preferably in groups or tufts arranged in rows extending longitudinally of the shaft as seen in FIGS. 2 and 3. The rows of bristles are spaced angularly from one another about the shaft. As seen in FIG. 2 there are four rows of bristles disposed approximately ninety degrees apart with intervening spaces

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between the rows of bristles. The shafts 6 of the brushes 1, 2, 3 and 4 are disposed parallel to one another and are arranged in a square pattern, i.e. at the corners of an imaginary square as seen in FIG. 2 so that brushes 1 and 2 constitute an upper pair of brushes while brushes 3 and 4 constitute a lower pair. The spacing between the shafts of the brushes is less than the radius of the brushes, i.e. less than the length of the bristles, so that the bristles of vertically and horizontally adjacent brushes overlap. Thus, in a horizontal direction the bristles of brushes 1 and 3 overlap the bristles of brushes 2 and 4 respectively while in a vertical direction the bristles of brushes 1 and 2 overlap the bristles of brushes 3 and 4 respectively. The amount of overlap is preferably about one fourth the length of the bristles. In the embodiment illustrated by way of example in the drawings, the overlap is approximately one quarter inch. The brushes are rotated in the directions indicated by the arrows in FIG. 2 by suitable driving mechanism 8 comprising for example an electric motor and suitable gearing enclosed in a casing 9. The electric motor and gears may, for example, be of a kind similar to those used for electric mixers and, as in an electric mixer, may be provided with suitable speed control means and with a switch 10 and electric cord 11. As suitable motors and gears are well known, they are not illustrated in the drawings. A handle 12 is provided on the top of the drive mechanism case 9 for carrying the machine.

One end of each of the brush shafts 6 extends into the drive case 9 where it is connected to the drive mechanism and rotatably supported by suitable bearing means (not shown). The other end of each shaft is received in a bearing 14 in an upright support plate 15 provided in the housing at the outboard ends of the brush shafts. The brushes are preferably removable like the blades of an electric mixer so as to facilitate cleaning and replacement. For example, the ends of the brush shafts fit frictionally into driving sockets provided in the driving mechanism 8.

The housing or casing 5 comprises a trough-shaped lower casing 16 secured at one end to the drive casing 9 and an inner casing or lining 17 which is likewise trough-shaped and has sidewalls which terminate in outwardly projecting ledges 18 which extend out over the upper edges of the trough-shaped casing member 16. The ledges 18 are disposed slightly below a horizontal plane midway between the upper and lower brushes. The housing further comprises an inverted trough-shaped cover 20 having a curved top wall 21, approximately vertical side walls 22 and an end wall 23. Horizontal ledges 24 at the lower edges of side walls 22 extend both inwardly and outwardly and rest on the ledges 18 of the lower casing member 17. Suitable locking means, for example in the form of clips 25, are provided for removably securing the cover 20 to the lower portion of the housing.

Openings are provided in the cover 20 for introducing articles to be polished between the rotating brushes. The openings include elongate openings 26 in the sidewalls 22 just above the laterally extending ledges 24. The openings 26 extend almost the full length of the brushes and are of a suitable size to permit the insertion of an article to be polished, for example a piece of silverware S as indicated in broken lines in FIGS. 1 and 2. Each of the openings 26 is partially closed by a yieldable screen shown in the form of an elongate brush 27 comprising a single row of bristles 28 projecting downwardly from a shaft 29 rotatably supported by brackets 31 on the inside of the cover 20. A spring 32 yieldable holds the brush 27 in a vertical position while permitting it to swing against spring tension when deflection of the brush is required to permit the insertion or removal of an article to be polished.

The upper curved top 21 of the cover 20 is also provided with a central opening 34 which extends longitudinally of the cover approximately the full length of the brushes. The opening 34 can be closed by a removable lid 35 provided with a suitable handle 36. Spring clips 37 secured on the inside of the lid 35 near its ends are adapted to slip under the end edges of the opening 34 so as to secure the cover 35 removably in position to close the opening.

Means is provided for supplying silver polish to the brushes 1, 2, 3 and 4 as they rotate. The polish is preferably in paste form. The means for supplying polish to the upper brushes 1 and 2 comprises elongate troughs 40 secured on the inside of the upper wall 21 of the cover 20 along the lateral edges of the opening 34. The troughs project out under the opening 34 so that polish, for example in paste form, can be introduced into the troughs through the opening. Each trough 40 comprises a perforate portion 41 located at the lower and inner portion of the trough in position to be engaged by the tips of the bristles of brushes 1 and 2 as the brushes rotate. Perforations in the portion 41 are preferably in the form of narrow slits extending crosswise of the trough as seen in FIG. 4 and hence, approximately in the direction of movement of the bristle tips engaging the trough. Means is provided in each trough for pressing the paste polish toward the perforate wall portion 41. The pressing means is illustrated in the drawings as an elongate movable partition 42 which extends the full length of the trough and is resiliently pressed toward the perforate wall portion 41 by a leaf spring 43. The partition 42 is manually held back against the force of the spring 43 while the trough 40 is filled by introducing paste polish into it through the opening 34 in the cover. The partition 42 is then released and tends to press the paste polish against the perforate wall portion 41 through the perforations of which it is picked up by the bristles of the brushes as they rotate.

Polish is supplied to the lower brushes 3 and 4 by similar feed troughs 45 secured on the inside of the lower casing member 17. The lower feed troughs 45 likewise have perforate portions 46 which are engageable by the tips of the bristles of the lower brushes 3 and 4 and toward which polish is pressed by elongate partitions 47 biased toward the perforate wall portions by leaf springs 48. Removal of the cover 20 affords access to the lower feed troughs 45 for filling them.

Articles to be polished are guided between the brushes by the openings in the cover and by the horizontal ledges 24. In FIGS. 2, 3 and 4 there is shown additional guiding means in the form of elongate horizontal rollers 51 and 52. The rollers are located on opposite sides of a horizontal plane passing midway between the upper and lower brushes and have their axes in a vertical plane midway between the left hand brushes 1 and 3 and the right hand brushes 2 and 4 as viewed in FIG. 2. Each of the rollers is shown as comprising a shaft 53 and a soft rubber or plastic covering 54. Reduced end portions of the shafts 53 are received in slots in tubular columns 55 located at opposite ends of the rollers and connected with one another by upper and lower longitudinal members 56 and 57. The upper and lower rollers are resiliently pressed toward one another by relatively soft upper and lower coil springs 58 and 59 surrounding the columns 55 and acting between the shaft ends and the longitudinal connecting members 56 and 57. The lower ends of the tubular columns 55 are removably received in tubular sockets 60 so that when the cover 20 has been removed, the roller assembly comprising the rollers 51 and 52, upright columns 55, springs 58 and 59 and connecting longitudinal members 56 and 57 can be lifted out of the sockets 60 and thereby removed from the machine. When the roller assembly is in place as illustrated in FIGS. 2, 3 and 4, the rollers 51 and 52 guide an article of silverware such

as the article S inserted horizontally between the upper and lower rollers as illustrated in FIG. 2. The spring press rollers automatically separate to accommodate articles of different sizes and since the upper and lower springs 58 and 59 are approximately of equal force, the rollers tend to center the article S between the brushes.

The operation of the machine will be readily understood from the foregoing description and the accompanying drawings. With the cover 20 removed, paste polish is introduced into the lower feed troughs 45. The cover 21 is then placed on the lower casing portion and secured by the locking means 25. With the lid 35 removed, the upper feed troughs 40 are likewise filled with polish. This may be done either before or after applying the cover. The driving mechanism 8 is then started by means of the switch 10 so as to rotate the brushes 1, 2, 3 and 4 in the directions indicated by the arrows in FIG. 2. It will be noted that the upper brushes 1 and 2 rotate in one direction (clockwise) while the lower brushes 3 and 4 rotate in the opposite direction (counterclockwise). Silverware to be polished is then introduced between the brushes, for example by inserting it horizontally through one or the other opening 26 at the sides of the cover as illustrated in FIG. 2. The silverware is guided by the ledges 24 and also by the rollers 51 and 52. The silverware may be inserted from one side of the machine and then retracted to the same side whereupon it is reversed end-for-end and the opposite end is then inserted into the machine. Alternatively, the silverware may be passed completely through the machine from one side to the other. The screen comprising the brushes 27 permits the insertion of pieces of different sizes while substantially closing the openings when no article is inserted. The brushes 1, 2, 3 and 4 are rotated at a selected speed to provide rapid polishing of articles introduced between them but without excessively throwing off by centrifugal force the polishing material picked up by the brushes from the feed troughs 40 and 45. If any material is thrown off by the rotating brushes it is blocked by the screen brushes 27 so that it is not ejected through the openings 26.

Alternatively, articles to be polished can be introduced into the machine through the upper opening 34 in the cover 20. When the machine is to be used in this manner, the guiding assembly comprising rollers 51 and 52 is removed as is also the lid 35. An article F can then be introduced between the rotating brushes as illustrated schematically in FIG. 5. After one end of the article has thus been polished the article is withdrawn and the opposite end is then inserted.

As the lid 35, cover 20, guide roller assembly including the rollers 51 and 52, the rotating brushes 1, 2, 3 and 4 and the liner 17 of the lower casing are readily removable, the machine can be easily cleaned and serviced. To facilitate disassembly of the machine, curved rockers 61 are loosely mounted on the inner wall of the drive case 9 by screws 62 and engage under washers 63 axially fixed on the brush shafts 6. Pressure on the outer ends of the rockers causes the inner ends of the rockers to exert a force in an axial direction on the shafts 6 so as to withdraw them from driving sockets of the drive mechanism in which they are releasably received.

While a preferred embodiment of my invention has been illustrated by way of example in the drawings, it will be understood that the invention is in no way limited to the details of the illustrated embodiment.

What I claim and desire to secure by Letters Patent is:

1. A polishing machine, particularly for silverware, comprising a housing, four rotary brushes in said housing, each of said brushes comprising a rotatably mounted shaft and bristles radiating from said shaft, said brushes being arranged in a square pattern with their shafts parallel to one another and equally spaced apart, the shafts of first and second said brushes being spaced horizontally and the shafts of third and fourth said brushes being spaced horizontally from one another and spaced vertically from

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the shafts of said first and second brushes respectively, the spacing of said shafts being less than the radius of the brushes so that the bristles of each brush overlap by a selected amount the bristles of the horizontally and vertically adjacent brushes, drive means for rotating said brushes at a selected speed, means for supplying polish to said brushes and means for guiding articles to be polished between said brushes so as to be engaged on opposite sides by said brushes.

2. A polishing machine according to claim 1, in which said means for supplying polish comprises an elongate trough having a perforate wall and being adapted to receive polish in paste form, means mounting said trough parallel to a brush shaft in position for engagement of said perforate wall by the bristles of said brush and means in said trough for pressing said polish toward said perforate wall.

3. A polishing machine according to claim 1, in which said means for supplying polish comprises means for individually feeding polish to each brush during rotation of said brushes.

4. A polishing machine according to claim 1, in which said housing is provided at opposite sides with openings for introduction of articles to be polished between vertically spaced brushes, and in which flexible screen means is provided for partially closing said openings while permitting the introduction of articles therethrough.

5. A polishing machine according to claim 4, in which said screen means comprises a brush mounted along one side of said opening and having bristles extending at least partially across said opening.

6. A polishing machine according to claim 1, in which said guide means comprises at least one elongate guide

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roller disposed between said brushes and rotatable about an axis parallel the shafts of said brushes.

7. A polishing machine according to claim 6, in which said guide means comprises two elongate rotatable guide rollers disposed one above the other with their axes approximately in a vertical plane midway between the shafts of said first and second brushes, and with said rollers on opposite sides of a horizontal plane midway between the axes of said first and third brushes.

8. A polishing machine according to claim 7, in which said rollers are movable vertically relative to one another and in which means is provided for yieldably biasing said rollers toward one another.

9. A polishing machine according to claim 1, in which said housing is provided at its top with an opening for introducing articles to be polished downwardly between said first and second brushes and between said third and fourth brushes.

10. A polishing machine according to claim 1, in which said drive means rotates two of said brushes in one direction and rotates the other two of said brushes in the opposite direction.

11. A polishing machine according to claim 1, in which the bristles of adjacent brushes overlap by approximately one fourth the radius of said brushes.

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