

Sept. 29, 1936.

C. R. MOON

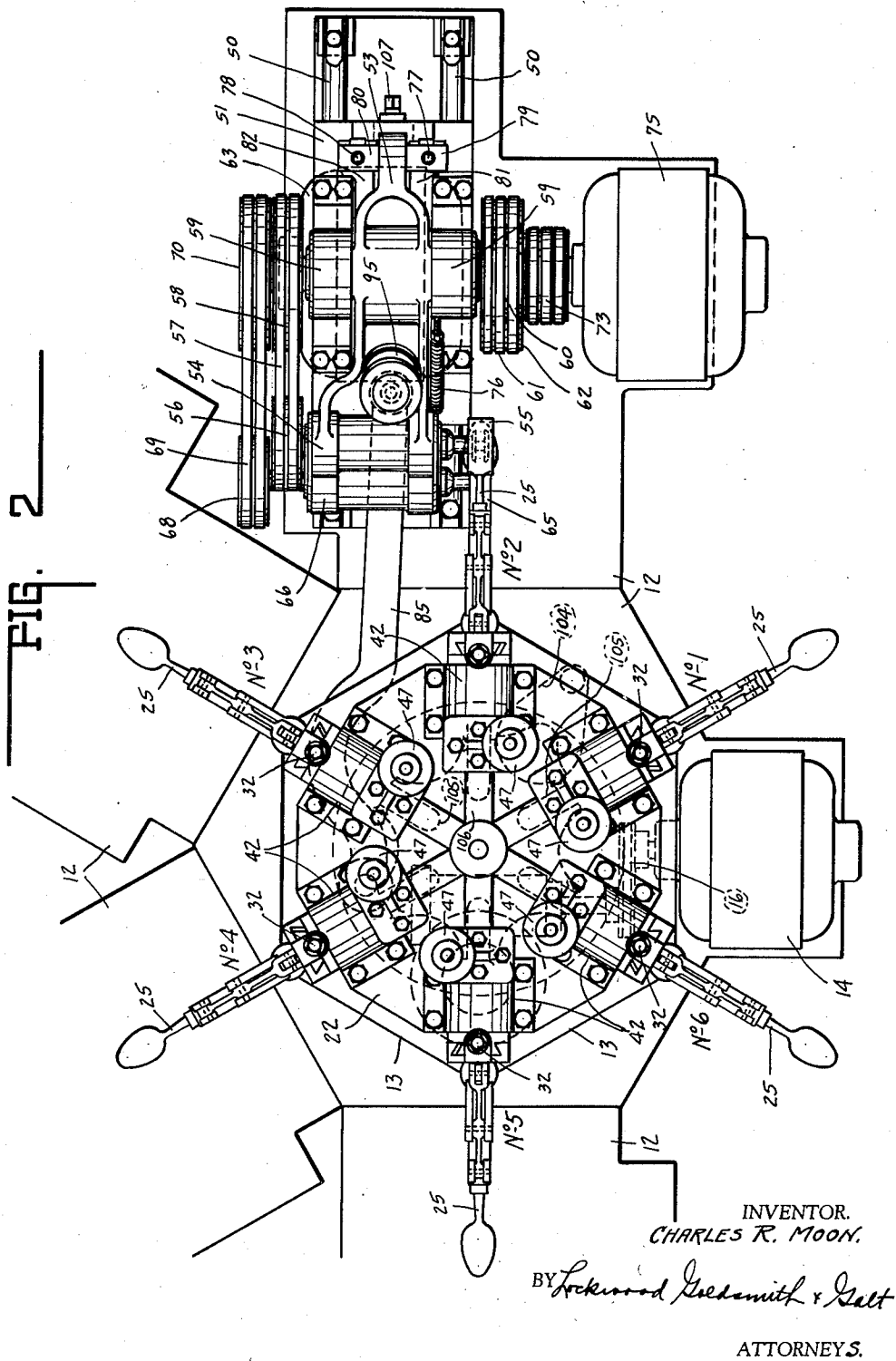
2,055,665

APPARATUS FOR BUFFING AND POLISHING ARTICLES

Original Filed June 7, 1935

4 Sheets-Sheet 2

FIG. 2



INVENTOR.
CHARLES R. MOON.

BY *Lockwood Greene Smith & Salt*

ATTORNEYS.

Sept. 29, 1936.

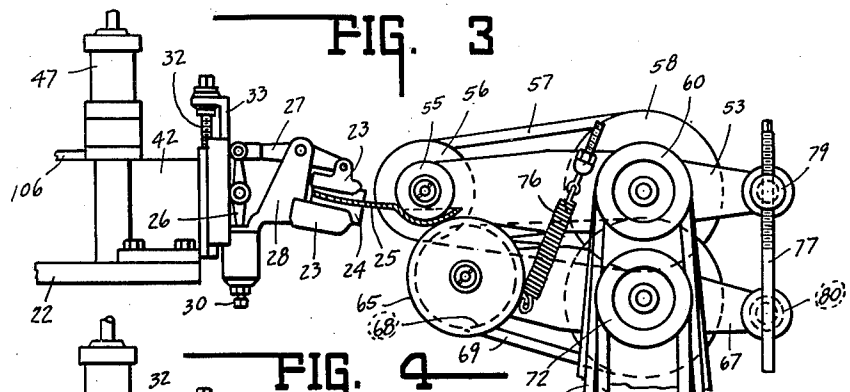
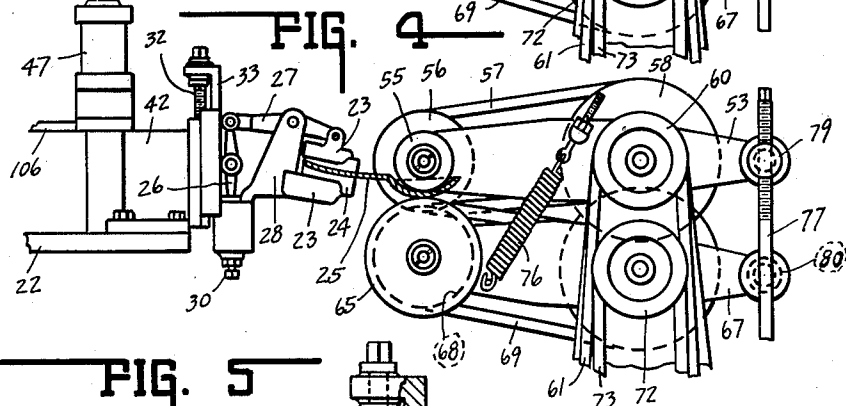
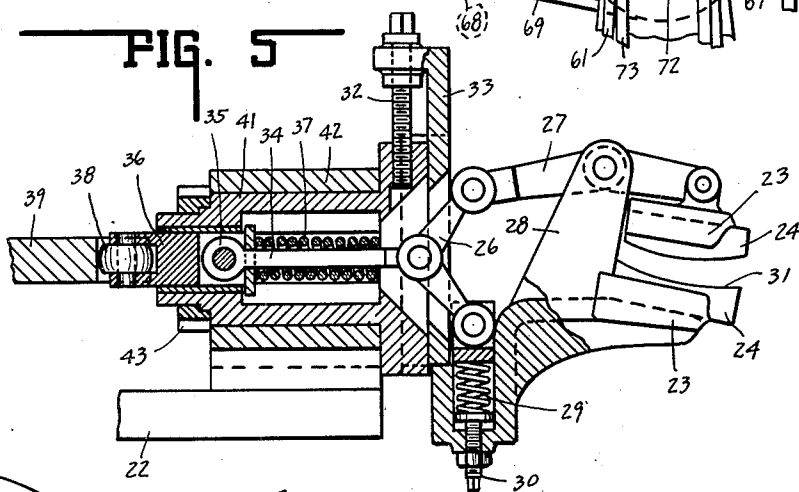
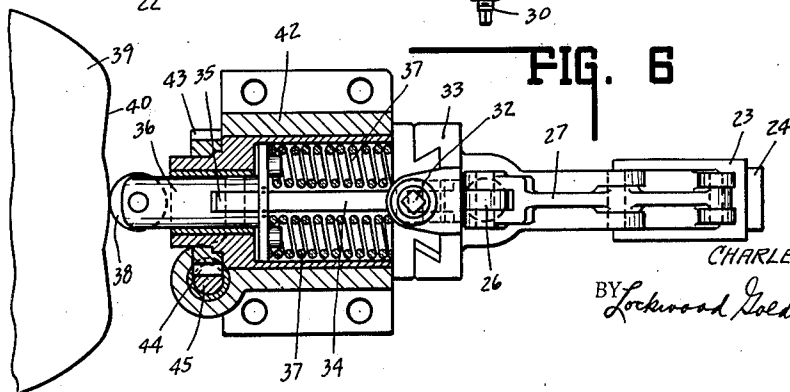
C. R. MOON

2,055,665

APPARATUS FOR BUFFING AND POLISHING ARTICLES

Original Filed June 7, 1935

4 Sheets-Sheet 3



INVENTOR.

CHARLES R. MOON.

BY *Lockwood, Goldsmith & Galt*

ATTORNEYS

Sept. 29, 1936.

C. R. MOON

2,055,665

APPARATUS FOR BUFFING AND POLISHING ARTICLES

Original Filed June 7, 1935

4 Sheets-Sheet 4

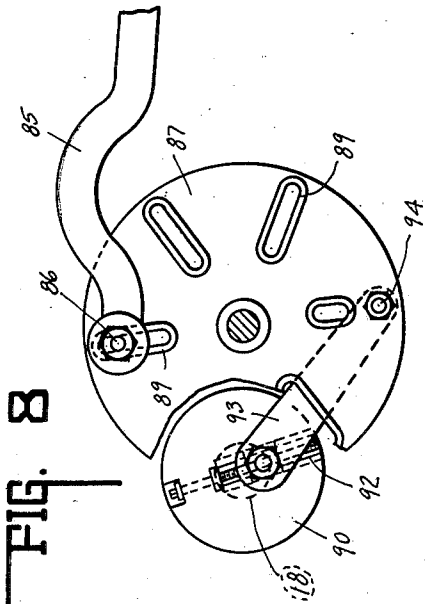
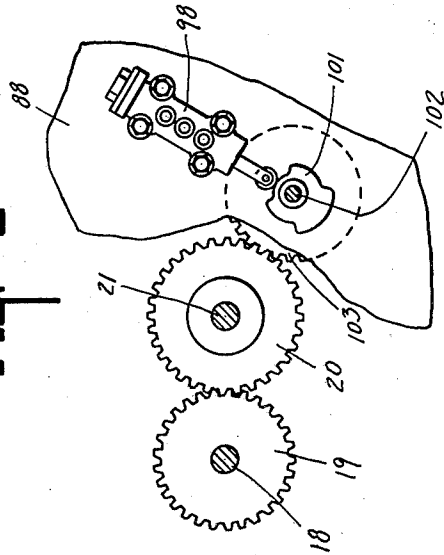
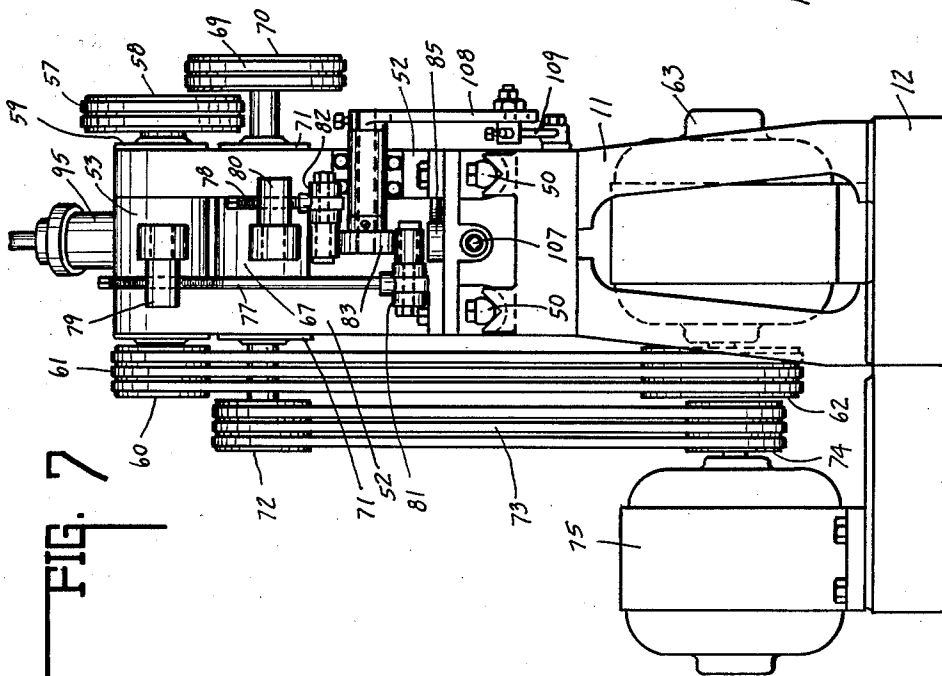


FIG. 9



INVENTOR.
CHARLES R. MOON.

BY *Lockwood, GreenSmith & Salt*

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,055,665

APPARATUS FOR BUFFING AND
POLISHING ARTICLES

Charles R. Moon, Muncie, Ind., assignor to Ontario Manufacturing Company, Muncie, Ind., a corporation

Original application June 7, 1935, Serial No. 25,478. Divided and this application October 14, 1935, Serial No. 44,813

14 Claims. (Cl. 51—40)

This invention, the application for which is a division of applicant's application Serial No. 25,478, filed June 7, 1935, entitled "Method of buffing and polishing and apparatus therefor", relates to a buffing and polishing apparatus, particularly in respect to articles having a curved formation, such as the curved handles of tableware, the curvature of table forks, spoon bowls, and the like.

It is the object of this invention to provide an apparatus for automatically buffing or polishing an article which is mechanically presented to a pair of buffing or polishing wheels so that the operation may be simultaneously applied to both opposite surfaces and permit relative movement between the article and wheels to accommodate them to various curvatures which may be found in the article.

Another feature of the invention resides in oscillating the article laterally with respect to the plane of rotation of the wheels, particularly wherein the surface to be polished is concavo-convex, as in the bowl of a spoon. In such instance the oscillation is about the center of curvature of the bowl, resulting from oscillation of the gripping jaws.

Another feature of the invention resides in the reciprocatory movement of the buffing and polishing wheels longitudinally of the article, thus covering a substantial surface thereof longitudinally as well as laterally through oscillation of the article as above described.

Another feature of the invention resides in the up and down movement of the polishing wheels simultaneously with, or independently of, the movements above described for following variations in longitudinal curvature of the article, such as a spoon handle.

Other features of the invention will be hereinafter more fully set forth and described in the following specifications and the accompanying drawings.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a side elevation of an apparatus employed for carrying out the invention. Fig. 2 is a plan view thereof. Fig. 3 is a side elevation of a portion of the apparatus illustrating the relation of the buffing and polishing wheels to the bowl of a spoon at the second stage of the operation. Fig. 4 is the same as Fig. 3 showing the third stage thereof. Fig. 5 is a section through the gripping jaws for holding the article in operative position, with the jaws in open position

with parts in section. Fig. 6 is the same as Fig. 5 showing a plan view thereof with parts in section. Fig. 7 is a rear elevation of the buffing and polishing unit. Fig. 8 is a section taken on the line 8—8 of Fig. 1. Fig. 9 is a section taken on the line 9—9 of Fig. 1.

For purposes of illustration of one type of apparatus, there is herein shown in the drawings a frame support 10 for the turret unit, and a frame support 11 for the buffing and polishing unit. Both frames are mounted upon a base plate 12, the turret having a top plate 13. The turret structure embodies a turntable having a plurality of gripping jaws thereon, there being illustrated herein six in number spaced radially around the turntable. As indicated in Fig. 2, there is a plurality of buffing or polishing units spaced about the turret. One such unit is illustrated in Figs. 1 and 2, and similar duplicate units are indicated in Fig. 2 as being positioned about the turret at four spaced stations.

In general operation, the specific apparatus illustrated herein is so arranged that the article is moved about the turret, coming to rest at one of the six stations. At the first station, the jaws which are open, clamp the article. It is then carried by the turntable to the next station, wherein it is presented to the buffing or polishing wheels for the first operation. When the article is brought to each succeeding station, it comes to rest for a period of sufficient duration to permit of the buffing or polishing operation. Thereupon it proceeds to the next station for the next succeeding operation. After passing through the several operating stations, it comes to a releasing station, wherein the jaws open and the article drops out, the jaws remaining open for replacing another article until they are closed at the first-mentioned station.

For driving the turntable and associated parts there is provided a motor 14 mounted on the base 12 which drives a worm 15 through a driving belt 16. The worm 15 drives a worm wheel 17, which in turn drives a shaft 18 to which is keyed a gear 19 meshing with an idler gear 20 rotating on an oscillating shaft 21. The shaft 21 extends upwardly through the top plate 13, having its upper portion hollow and centering the turntable 22 which is intermittently rotated as hereinafter described. Said turntable carries a plurality of article-gripping jaws 23 in which are mounted removable holder blocks 24 between which the article 25 is gripped.

As illustrated in Figs. 5 and 6, the gripping jaws 23 are operated by a toggle 26 connected

with a lever 27 pivoted on a bracket 28 which rigidly supports the lower jaw, the upper jaw being pivoted to the end of the lever 27. One end of the toggle bears upon the compression spring 29 supported in the well of the bracket and adjustable by a screw 30 for controlling the yielding pressure under which the article 25 is gripped. The jaws are adapted to receive the removable holder blocks 24 which are changed to accommodate the curvature of their adjacent faces 31 to the corresponding curvature of the particular article to be gripped thereby. To center the elevation of the jaws with respect to the buffing and polishing wheels there is provided a screw 32 which adjustably positions the jaw-supporting plate 33. The toggle 26 is actuated by a rod 34 having an eye 35, which is fulcrumed in the plunger 36. Said plunger is held under spring tension by the springs 37 against a cam 39 so that in normal extended position the jaws are held open as illustrated in Fig. 5 and in compressed position they are closed to article clamping position. The plunger 36 is provided with a roller 38 which is engaged by the periphery of the cam 39, which cam is supported above the turntable so as to be oscillated with respect to the top plate 13 and jaws, whereby the turntable, with the clamping members, rotates thereabout during its oscillatory movement.

The cam is provided with a relieved portion of its periphery, indicated at 40, so that when the roller rides over said relieved portion, it releases or opens the jaws and when it rides over the remaining periphery of the cam, the plunger is forced forwardly under tension of the springs 37 to close the jaws and clamp the article. Thus, as indicated in Fig. 2, the jaws are held in clamping position by the periphery of the cam at stations No. 1, No. 2, No. 3, No. 4 and No. 5. At station No. 6, the roller rides into the relieved portion 40 to open the jaws which remain open until station No. 1 is reached, whereupon the jaws are again clamped on the next article to be treated.

The clamping jaws and the associated mechanism above described are all supported by a cylindrical housing 41 having a horizontal axis, said housing being rotatably mounted within a bearing 42 supported by the turntable 22. Thus, the jaws are free to oscillate about a horizontal axis. For oscillating said jaws there is provided a pinion 43 keyed to the barrel-like housing 41, which pinion is engaged by a rack 44 mounted on the vertically-extending plunger 45 of a piston 46 mounted in an air cylinder 47. Thus, upon operation of the piston in the air cylinder in the usual manner for reciprocating the rack 44, the jaws 23 are oscillated about a horizontal axis. The piston in the air cylinder is operated in the manner hereinafter described.

One of the several buffing and polishing units supported by the frames 11 will be described, it being understood that there is a plurality of such units spaced around the turret, as above mentioned. Mounted on the frame 11 there is a pair of horizontally-disposed slide bars 50 upon which a carriage 51 is adapted to reciprocate to and from the turret by the means hereinafter described. Supported upon the carriage there is a framework 52 carrying a pivotally-mounted arm 53 at the top thereof. The forward end of said arm carries a supporting bearing 54 for the drive shaft carrying the upper buffing and polishing wheel 55. The opposite end of the shaft from the wheel is provided with a pulley 56 driven by a belt 57 from a pulley 58. The pulley 58 is mounted on

a shaft extending through a bearing support 59 having a pulley 60 on the opposite end thereof which is driven by a belt 61 on a pulley 62, the latter pulley being driven by a motor 63.

The lower wheel 65 is mounted upon the bearing head 66 which in turn is supported by an arm 67 pivoted on the frame 52. The wheel 65 is driven through the head 66 by a pulley 68 and belt 69 from pulley 70 positioned immediately below the pulley 58. The pulley 70 is mounted upon a shaft extending through a bearing 71 upon the other end of which a pulley 72 is mounted driven by a belt 73 from a pulley 74 by a motor 75.

The wheels 55 and 65 are held together under spring tension by a spring 76 adjustably connected to the respective wheel supporting arms 53 and 67. Thus, the article 25 being processed is clamped between the wheels 55 and 65 under spring tension. However, the relative position of the said wheels as well as their position in respect to the article may be adjusted to take up for wear or for varying positions of the article by the adjustable screws 77 and 78. The screw 77 screws through a knob 79 on the arm 53, and the screw 78 screws through a similar knob 80 on the arm 67. Said screws are both anchored at their lower end to the arms 53 and 67, respectively. Thus, the screw 77 has a tendency through the tension of the spring to pull the arm 53 upwardly against a cam 83 while the tension of the spring 76 forces the screw 78 and arm 67 downwardly against said cam. Each of said arms 53 and 67 is pivotally connected to fixed portions of the frame at 84. The function of the cam 83 is to simultaneously raise and lower the wheels 55 and 65 to correspond with their movement back and forth as hereinafter described so that they will jointly follow the curvature of the article to be operated upon.

For moving the wheels back and forth longitudinally of the article, the carriage 51 is caused to slide upon the rods 50 by a link 85 which is pivotally connected to said carriage at one end. The other end of said link is pivotally and adjustably connected by a bolt 86 to an oscillating disk 87 pivotally supported upon a bed plate 88, the bolt 86 extending through one of the radial slots 89 formed in said disk. Said disk is provided with similar slots to which smaller corresponding arms 85 are connected for each of the several buffing and polishing units.

The disk 87 is oscillated by a driving disk 90 keyed to and driven by the shaft 18 and having its bearing in the bed plate 88, as indicated at 91. The driving disk 90 is provided with a diametrically-extending T-groove 92 for adjustable reception of the connecting head of the link 93. The other end of said link is bolted to the disk 87 at 94.

The jaws 23 are laterally oscillated and the buffing and polishing wheels 55 and 65 are opened and closed in respect to the articles 25 by compressed air. The operation of the rack and pinion arrangement for oscillating the jaws is above described as being actuated by the piston and cylinder 46, 47. For opening and closing the buffing and polishing wheels there is provided a cylinder 95 containing a piston 96. The cylinder 95 is mounted on the arm 53 and the piston 96 is connected by a plunger 97 with the arm 67. Thus, when the piston is forced downwardly, it causes the arms 53 and 67 to spread, thereby separating the wheels 55, 65 against the tension of the springs 76. The cylinder 95

is connected with a valve 98 through an air line, as indicated in Fig. 1.

The air cylinder 99 which is connected to the valve 98 through the air line 100 oscillates the shaft 21 through the rod and crank connection illustrated by dotted lines in Fig. 1, to impart an oscillatory movement to the cam 39 in timed relation to the rotary movement of the turn-table through the Geneva movement spider herein-after described. This is for the purpose of alternately moving the reduced portion 40 of the cam 39 back and forth to more quickly and timely open and close the jaws 23. The compressed air delivered to the valve 98 for distribution in timed relation to the various cylinder 47, 95 and 99 is drawn from any suitable source of compressed air not shown herein, through a central air line leading to the valve which likewise is not illustrated. It will be further noted in this connection that the lines leading to the cylinders 47 are omitted, which lines may be carried down through the central opening in the spider 106 to the valve 98, said spider 106 being mounted upon the bearings 42 to support the cylinders 47 and the air conduits leading thereto.

The valve 98 is controlled by a plunger-actuating cam 101 keyed to a shaft 102 driven by a gear 103 meshing with the gear 20 so as to operate the valve in timed relation with the movement of the turret. The turret likewise is rotated in timed relation with the operation of the valve through the medium of a Geneva driving shaft 104 engaging and driving a Geneva movement spider 105, said driving shaft 104 being keyed to and driven by the drive shaft 102. Thus, the turret carrying the six clamping jaws 23 is periodically rotated to move said jaws from station to station and cause them to dwell at each station for sufficient length of time to receive and discharge the article and effect the buffing and polishing operation.

In operation, the turntable or turret is rotated by the Geneva movement periodically from one station to the other, dwelling at each station sufficiently long to effect a complete operation at that station. In passing from station No. 6 to station No. 1, the jaws 23 are opened. Suitable blocks 24 have been mounted in the jaws to accommodate by their curvature the particular article to be treated. During the movement from station No. 6 to station No. 1, the article is inserted, either automatically or manually, into the clamping jaw, wherein it is rigidly clamped at station No. 1. The Geneva movement then carries it to station No. 2. During its movement to Station No. 2, the valve 98 has operated to actuate the piston and cylinder 96 and 95 to open the buffing and polishing wheels 55, 65. Upon the station being reached, the article is positioned between said wheels which close and clamp upon it under tension of the spring 76 through the reverse action of the valve 98, cylinder and piston 95 and 96. The wheels are continuously rotated by the motors 63 and 75 so that as soon as they are brought together by the action of the compressed air and spring, the buffing and polishing of the article begins and continues until rotation of shaft 102 again operates the Geneva movement and valve 98 to separate the wheels and rotate the turret to carry the article to station No. 3. While at station No. 2, however, the valve 98 is also operated to actuate the piston and cylinder 46, 47, which swings and oscillates the article laterally about a horizontal axis to different lateral positions

with respect to the buffing and polishing wheels.

After the dwell at station No. 2 sufficiently long to effect the desired buffing and polishing operation as above described, the shaft 102 causes the valve 98 to separate the wheels so as to release the article and the oscillation of the article is stopped by the valve 98. Thereupon the shaft 102 again actuates the Geneva movement to rotate the turret for carrying the article to station No. 3. At station No. 3 another but similar operation is performed followed by corresponding operations at station No. 4 and station No. 5. At station No. 6, the stationary cam 39 permits opening of the jaws so that the article is released, the jaws remaining open for receiving a new article until the turret rotates the jaws to station No. 1.

Wherein the character of the article operated upon is such that it is desirable to have the buffing and polishing wheels moved longitudinally over it, the wheels supported on the carriage 51 are caused to reciprocate back and forth through the medium of the link 85 which may be disconnected where such movement is not desired, or adjusted in slots 89, and the extent of its movement controlled through adjustment of the link 93.

Wherein the character of the article is such that during the longitudinal movement of the buffing and polishing wheels, it is necessary to follow a particular curvature, the cam 83 may be operated to raise and lower the arms 53, 67 during the back and forth reciprocating movement of the carriage. Any desired curvature may be followed in this manner by changing the position of the cam 83, said cam being driven with such movement as desired by a yoke 108 extending down to the frame 11 and pivotally connected therewith through the link 109. Thus, upon the carriage 51 being reciprocated back and forth by the link 85 and relative to the stationary frame 11, the cam 83 will be caused to rock by reason of such relative movement. The relative position of the wheels and carriage to the turret may also be adjusted through the longitudinally extending adjusting screw 107.

The apparatus is shown herein as applied to the bowl of a spoon. In operating upon the bowl, it is desirable to have the oscillating or rocking action so that the side surfaces of the bowl will be acted upon by the polishing wheels as well as the central portion thereof. By reason of the character of the bowl of the spoon, station No. 2 operates thereon as indicated in Fig. 1, wherein the top or smaller wheel 55 rotating in a counterclockwise direction at about 5000 R. P. M. lies in engagement with the upper surface of the front end of the bowl. The lower and larger wheel 65 operating at about 3000 R. P. M., rotates in a clockwise direction, engaging the undersurface of the bowl toward the heel portion. When the spoon is carried to station No. 3, the relative positions of the wheels are as illustrated in Fig. 3, wherein the upper wheel engages the upper surface of the bowl joining the handle, while the lower wheel engages the undersurface of the bowl toward the free end thereof. When the turret carries the article to station No. 4, the wheels are in the relative positions illustrated in Fig. 4, wherein the upper wheel engages the central portion of the upper surface of the bowl and the lower wheel engages the central portion of the undersurface thereof.

Station No. 5 may or may not be employed for an operation. However, such station is provided

to take care of any additional operation which may be necessary, or to operate upon any portion of the article which has not been fully or sufficiently covered by the preceding three operations.

Wherein it is desired to buff and polish the handle of the spoon, the clamping blocks 24 are designed to conform to the curvature of the bowl of the spoon so that the handle protrudes from the jaws for receiving the operation. When the handle is operated upon, it is not necessary to utilize the oscillating movement so that the valve piston and cylinder 46, 47 are disconnected. In this instance, however, it is desirable to so adjust the link 93 as to give substantial longitudinal movement to the wheels through the link 85, the cam 83 being so arranged and provided as to cause the wheels to move up and down as they move longitudinally of the handle in order that their travel may correspond to the curvature.

The invention claimed is:

1. An apparatus for buffing and polishing articles comprising an article-holding device, a buffing and polishing wheel against which the article is applied, means for rotating said wheel at a high rate of speed, means for simultaneously moving said wheel longitudinally and vertically with respect to the article and holding device, and means for automatically controlling said respective movements for causing said wheel to follow the surface of an article of varying contour.

2. An apparatus for buffing and polishing articles comprising an article-holding device, a pair of buffing and polishing wheels associated therewith between which said article is held, means for holding said wheels in engagement with opposite surfaces of said article, means for driving said wheels at a high rate of speed, means for simultaneously reciprocating said wheels in a direction longitudinally of the article, and means for jointly moving said wheels up and down simultaneously with their longitudinal movement.

3. An apparatus for buffing and polishing articles comprising a rotating turret, a plurality of article-holding devices spaced about said turret, means for intermittently rotating said turret to carry said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles at one of said stations and discharging them at another of said stations, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, and means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom.

4. An apparatus for buffing and polishing articles comprising a rotating turret, a plurality of article-holding devices spaced about said turret, means for intermittently rotating said turret to carry said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles at one of said stations and discharging them at another of said stations, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to re-

ceive the article therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom, and means for reciprocating said wheels longitudinally of said article for operating upon a given length of its surface.

5. An apparatus for buffing and polishing articles comprising a rotating turret, a plurality of article-holding devices spaced about said turret, means for intermittently rotating said turret to carry said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles at one of said stations and discharging them at another of said stations, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom, means for reciprocating said wheels longitudinally of said article for operating upon a given length of its surface, and means for jointly raising and lowering said wheels in timed relation to their reciprocating movement for following the contour of said article.

6. An apparatus for buffing and polishing articles comprising a rotating turret, a plurality of article-holding devices spaced about said turret, means for intermittently rotating said turret to carry said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles at one of said stations and discharging them at another of said stations, a pair of buffing and polishing wheels positioned at each of the intermediate operating stations for receiving one of said articles therebetween, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article during its dwell, and means for rocking said holding device during said dwell to permit lateral surfaces thereof to be brought into engagement with said wheels.

7. An apparatus for buffing and polishing articles comprising an article-holding device, a buffing and polishing wheel adapted to engage and operate upon the surface of said article, means for rotating said wheel at a high rate of speed, and mechanism actuated in timed relation for simultaneously moving said wheel longitudinally of the article and vertically to follow the contour thereof and oscillate said article laterally with respect to said wheel.

8. An apparatus for buffing and polishing articles comprising an article-holding device, a pair of buffing and polishing wheels between which said article is positioned, means for rotating said wheels at a high rate of speed, means for resiliently forcing said wheels against opposite surfaces of said article, and means for oscillating said article laterally about its longitudinal axis during the buffing and polishing operation.

9. An apparatus for buffing and polishing longitudinally curved articles comprising an article-holding device, a pair of buffing and polishing

wheels between which the article is positioned, means for resiliently forcing said wheels into operative engagement with the opposite surfaces of said article, means for manually adjusting the position of said article and wheels relative to each other, and mechanism for simultaneously moving said wheels as a unit longitudinally of said article and vertically relative thereto and oscillating said article about its longitudinal axis.

10. An apparatus for buffing and polishing articles comprising a carriage, a plurality of article-holding devices mounted in spaced relation thereon, means for intermittently carrying said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles and discharging them, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, and means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom.

11. An apparatus for buffing and polishing longitudinally curved articles comprising a carriage, a plurality of article-holding devices mounted in spaced relation thereon, means for intermittently carrying said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles and discharging them, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom, and means for reciprocating said wheels longitudinally of said article for operating upon a given length of its surfaces.

12. An apparatus for buffing and polishing longitudinally curved articles comprising a carriage, a plurality of article-holding devices mounted in spaced relation thereon, means for intermittently carrying said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles and discharging them, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driv-

ing said wheels at a high rate of speed in engagement with opposite surfaces of said article, means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom, means for reciprocating said wheels longitudinally of said article for operating upon a given length of its surfaces, and means for jointly raising and lowering said wheels in timed relation to their reciprocating movement for following the contour of said article.

13. An apparatus for buffing and polishing articles comprising a carriage, a plurality of article-holding devices mounted in spaced relation thereon, means for intermittently carrying said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles and discharging them, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, and means for oscillating said holding device about the longitudinal axis of the article held thereby during said dwell to permit lateral surfaces thereof to be brought into engagement with said wheels.

14. An apparatus for buffing and polishing longitudinally curved articles comprising a carriage, a plurality of article-holding devices mounted in spaced relation thereon, means for intermittently carrying said devices and articles held thereby from one station to another while permitting a dwell thereof at each station, means for automatically opening and closing said holding devices for receiving the articles and discharging them, a unit positioned at each station embodying a pair of buffing and polishing wheels adapted to receive one of said articles therebetween during its dwell, means for driving said wheels at a high rate of speed in engagement with opposite surfaces of said article, means for automatically opening and closing said wheels with respect to said article for receiving it therebetween and permitting it to be moved therefrom, means for reciprocating said wheels longitudinally of said article for operating upon a given length of its surfaces, means for jointly raising and lowering said wheels in timed relation to their reciprocating movement for following the contour of said article, and means for oscillating said holding device about the longitudinal axis of the article held thereby during said dwell to permit lateral surfaces thereof to be brought into engagement with said wheels.

CHARLES R. MOON.