A. B. NUTTING.

BUFFING AND POLISHING MACHINE.

APPLICATION FILED FEB. 15, 1908. RENEWED APR. 20, 1910.

973,135. Patented Oct. 18, 1910.

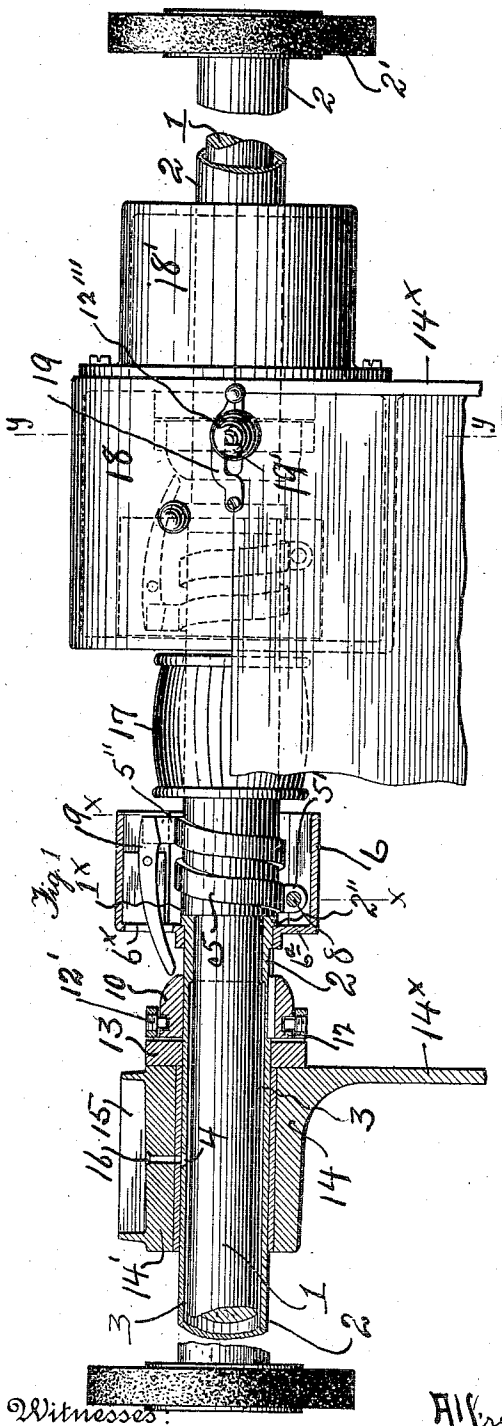

Fig. 1

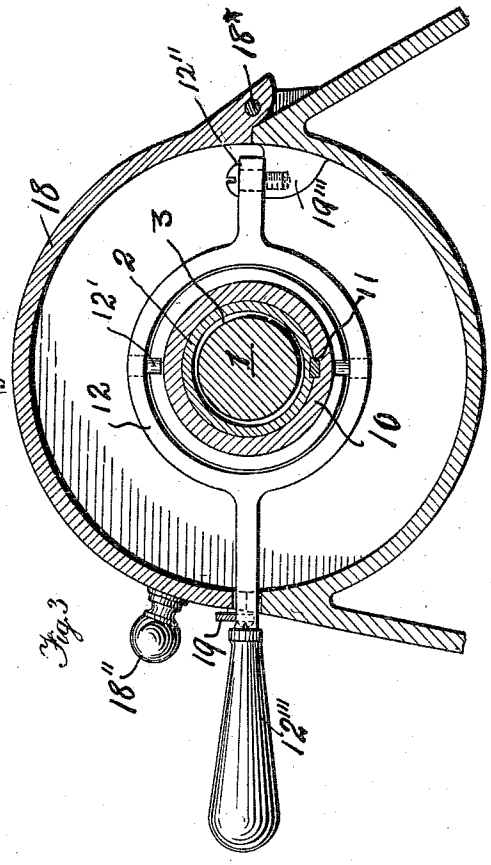

Fig. 3

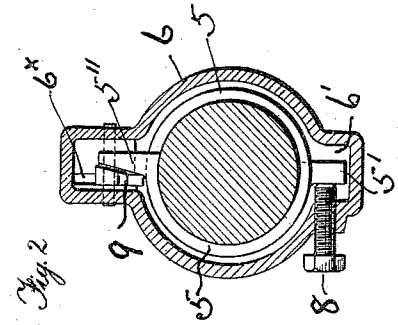

Fig. 2

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ALFRED B. NUTTING, OF SALISBURY, MASSACHUSETTS.

BUFFING AND POLISHING MACHINE.

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Application filed February 15, 1908, Serial No. 416,135. Renewed April 20, 1910. Serial No. 556,619.

To all whom it may concern:

Be it known that I, ALFRED B. NUTTING, a citizen of the United States, residing at Salisbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Buffing and Polishing Machines, of which the following is a specification.

My invention relates to buffing and polishing machines or machines for allied uses, and particularly to such machines provided with a main shaft carrying buffing or polishing wheels at both ends.

One of the inconveniences incident to machines having a main shaft provided with buffing or polishing wheels at both ends is that both of the polishing wheels being fast upon the said main shaft, it is necessary to stop work with one wheel when the wheel at the other end of the shaft has to be changed. These buffing wheels or pads have to be changed quite frequently, sometimes every few minutes in order to adjust buffers of the proper shape to the work being done. As it requires some time to change a wheel and as the work at the other end of the machine has to be stopped at the same time, the loss of time on the machine is considerable and the delay of great inconvenience.

The object of my present invention is to remedy the above mentioned troubles and to provide a double-ended buffing machine of the type commonly used by jewelers and like workers wherein the polishing or buffing wheels are independent of each other and adapted to be quickly thrown into or out of engagement with the main shaft independently of each other,—a further object being to provide a friction clutch connection between the wheel and the shaft to take up any jar incident to the throwing of one of the wheels into engagement with the main shaft, and of such a nature as not to retard the rotation thereof yet at the same time to provide a sufficiently long and steady bearing for the wheels that they may run absolutely true and with a minimum of friction.

To this end my invention consists in the arrangement of parts and details of construction as set forth in the accompanying drawings and particularly specified in the claims appended.

In the drawings, Figure 1 is a front elevation partly sectional of the upper portion of a polishing machine of the type commonly used by jewelers and silver workers, but embodying the improvements I have devised. Fig. 2 is a section of the main shaft and the clutch engaging therewith on line X—X of Fig. 1. Fig. 3 is a cross section on line Y—Y of Fig. 1.

Like numerals throughout the several views designate like parts.

14 designates the lower half of a journal box and 14′ the upper half thereof, both of the usual construction except that the upper half of the box contains a well 15 for lubricants as will be hereafter described. There are two of these journal boxes opposed to each other and mounted upon standards 14^{x} of any suitable supporting frame.

1 designates the central main driving shaft which projects through each journal box and is rotatable therein, the middle of said shaft being provided with a band wheel 17 of any desired form from which a band, not shown, runs to any suitable driving mechanism. This wheel is, of course, fixed upon the driving shaft 1.

The driving shaft 1 is formed with annular shoulders 1^{x} which as will be hereinafter explained, center and practically act as thrust collars to hold the shaft in its longitudinal position with relation to the bearings. The driving shaft 1 projects any suitable distance beyond the end of the journal box 14, and fitting over each end of the said shaft is a tubular shaft 2 which surrounds the ends of the driving shaft and is supported directly in the journal box 14. The outer end of this shaft is provided with a suitable means to which the ordinary buffing wheels 2′ are adapted to be attached in the usual manner. The inner end of the tubular shaft is formed with a shoulder 2″ outwardly projecting a slight distance and bearing against the shoulder 1^{x} of the driving shaft 1. The inside diameter of the tubular shaft 2 and the outside diameter of the driving shaft 1 are so proportioned that an oil space 3 is left between them and surrounding the said shaft 1. This oil space communicates by a duct 16 passing through the bottom of the oil reservoir 15 (that is, the upper section of the journal box). The tubular shaft 2 is provided with an opening 4 adapted to register with the duct 16 and communicates with the oil space 3. Thus any oil within the reservoir 15 finds its way through the duct 16 to the space 3 and thus lubricates the main driving shaft and the

tubular shaft. The lubricant well 15 is intended to be partly filled with wicking in order that the oil may not run too freely. The tubular shaft 2 is provided with a thrust collar 13 which normally has contact with the end of the bearing 14, 14′ and holds the said shaft in position.

Attached to the extreme inner end of the tubular shaft and therefore abutting against the shoulder 2 is the annular shell or casing 6 closed on its outer end by a flange which projects inward to the exterior of the tubular shaft and opened at its inner end adjacent to the band wheel 17. This forms one member and a casing for a friction clutch. Another member of the friction clutch is formed by a spiral flat spring 5 located inside the shell 6 and encircling the shaft 1. This spring when the friction clutch is not operatively arranged encircles the driving shaft.

One end of the spring, preferably the lower is turned outward as at 5′ and has engagement with the side of a recess 6′ in the casing 6 (through set screw 8). The other end of the spring is turned outward as at 5″ at right angles but is formed with a beveled exterior face. This beveled exterior face is adapted to engage with the end of a pivoted finger 9 having a beveled interior face which therefore wedges against it when the beveled end thereof moves downward or toward the driving shaft. At its other end 5′ the spring 5 is engaged by a set screw 8 by which the normal tension of the spring around the driving shaft 1 may be adjusted.

The finger 9 projects out through a slot 6× in the end of the casing 6 and contacts with the curved or beveled wedge face of a clutch ring 10. This ring is shiftable upon the exterior of tubular shaft 2 and is splined thereto by a key 11.

12 designates a shipper which is attached to the ring 10 by screws 12′ and it is pivoted at 12″ on a bracket hereafter referred to. The forward end of the ring is provided with a handle 12‴ projecting out through the casing of the machine. It will now be seen that by throwing the ring 10 inward or toward the finger 9, the outer end of the finger 9 will be forced outward and the inner end toward the shaft, when its wedgelike face will contact with the wedgelike projection 5″ of the spring 5, thus tightening the spring around the driving shaft 1. The revolution of driving shaft 1 will thus be communicated to the spring and the finger through the slot 6× will communicate this motion to the casing 6 and to the tubular shaft 2.

Surrounding and inclosing the bearing 14 and the clutch elements 10, 11 and 6, is the casing 18 and 18′ respectively. The casing 18 surrounds the clutch elements and the casing 18′ the journal box. This casing is made in an upper and a lower part, the upper part being pivoted as at 18× and provided with a handle 18″ whereby it may be raised. It is slotted for the passage of the handle 12‴ as shown in Fig. 1 and is preferably provided on its exterior with a pivoted latch 19 formed with a middle downwardly projecting tooth 19′. By raising the latch the handle may be shifted to the other extremity of the slot and will then be dropped, the tooth holding the handle in place in either position. The lower part of the casing is formed with a bracket 19‴ to which the shipper lever 12 is pivoted as at 12″. It is of course to be understood that the friction clutch and bearing on both sides are inclosed by these casings 18 18′.

The operation of my construction is as follows: The driving shaft 1 normally revolves at high speed and the shipper levers 12 being thrown outward, both the buffing wheels and their tubular shafts are out of engagement and remain idle. When, however, it is desired to use the buffing wheels, the shipper levers, either or both, are thrown inward. This in each case tightens the spring surrounding the driving shaft 1 and the frictional engagement between the driving shaft and the spring communicates the motion of said driving shaft to the tubular shafts 2. The object of the spring clutch is to permit the tubular shaft to be thrown into engagement with the driving shaft gradually so that the buffing wheels may gradually accelerate until they reach the speed of rotation of the main shaft without any shock or jar or without any retarding of the rotation of the main shaft. This is a most important point as the main driving shaft is run at a very high speed and it would not only tend to damage the machine to throw the tubular shaft into sudden engagement with the driving shaft but it also would tend to check the rotation of the tubular shaft on the opposite side. By my construction all jar is prevented, while at the same time a sufficient positive engagement is secured to communicate an absolutely positive motion to the buffing wheels. This again is a necessity because of the pressure that is brought to bear upon the buffing wheels and the consequent tendency to prevent their rotation. The pulley 17 being located between the two casings 18, 18 the belt may be taken either from the top or bottom or from the sides. The clutch mechanism is entirely protected from dust by the casings 18, 18′ yet the casings may be easily opened for repair or adjustment of the parts. The lubricant wells 15 maintain the long bearing between the tubular shaft and the driving shaft constantly supplied with oil by the entraining action of the surfaces thus avoiding any undue friction.

The adjusting screw 8 is for the purpose

of taking up wear and to permit the spring to be adjusted to varying degrees of slackness upon the main driving shaft.

Having described my invention what I claim is:

1. In a machine of the class described, a main driving-shaft, buffing wheels located one at each end of the main shaft but independent thereof and of each other, said buffing wheels being carried by independent shafts, and clutch mechanism coöperating with said main and independent shafts whereby either of the latter may be thrown into rotatable engagement with the said driving-shaft.

2. In a machine of the class described, a main driving-shaft, buffing-wheel shafts carrying buffing wheels located one at each end of the driving-shaft, the inner ends of said shafts and the recessed outer ends of said driving-shaft at all times having a concentric bearing engagement with each other, and means whereby the said buffing-wheel shafts are adapted to be moved each independent of the other into or out of engagement with the driving-shaft.

3. In a machine of the class described, a main shaft, work shafts carrying tools and surrounding and located one at each end of the driving-shaft, and clutch mechanism cooperating with said main and tool shafts and adapted to throw either of the tool shafts into or out of engagement with the driving-shaft.

4. In a machine of the class described, a main driving-shaft, buffing wheels located one at each end of the driving-shaft but independent thereof and of each other and each provided with a tubular shaft into which an end of the said driving-shaft enters, and clutch mechanism coöperating with said main and tubular shafts and adapted to throw either of the buffing wheels into engagement with the said driving-shafts.

5. In a machine of the class described, a main driving-shaft, buffing wheels located one at each end of the main shaft and independent thereof and of each other, a tubular shaft on each of the buffing wheels surrounding the end of the main shaft and freely rotatable concentric therewith, and clutch mechanism integral therewith and loosely surrounding the driving-shaft, and a collar surrounding said tubular shafts movable longitudinally thereon and engaging the clutch mechanism to throw either of the buffing wheels into engagement with the driving-shaft.

6. In a machine of the class described, a shaft composed of three independent sections concentric with each other, two of said sections carrying buffing wheels and the other section having means whereby it may be rotated, and means adapted to throw either of the buffing wheels into engagement with the rotatable section.

7. In a machine of the class described, a shaft composed of three independent sections concentric with each other, two of said sections carrying buffing wheels and the other section having means whereby it may be rotated, and means for gradually imparting rotating motion to the other two sections.

8. In a machine of the class described, a rotatable shaft made in three independent sections concentric with each other, two of said sections carrying buffing wheels and the other section having means whereby it may be rotated, a spiral resilient band loosely surrounding one of said sections and attached at one end to another of said sections, and means carried by one of said sections for tightening said band upon the other sections to the end that both sections may be rotated together.

9. In a machine of the class described, a rotatable shaft made in three independent sections concentric with each other, two of said sections carrying buffing wheels and the other section having means whereby it may be rotated, a spiral resilient band loosely surrounding one of said sections and attached at one end to another of said sections, a lever to which the other end of said band is connected, and means attached to and movable upon one of said sections for moving said lever to tighten the band upon the section which it surrounds.

10. In a machine of the class described, a rotatable driving-shaft, buffing wheels located one at each end of the driving-shaft and independent thereof and of each other, a tubular shaft on each one of the buffing wheels surrounding the driving-shaft and rotatable thereon, a resilient spiral band for each one of the buffing shafts loosely surrounding the driving-shaft, one end of said spiral band being attached to the said tubular shaft, the other end of said spiral band having means whereby it may be acted upon to draw the band tight upon the driving-shaft.

11. In a machine of the class described, a rotatable driving-shaft, buffing wheels located one on each end of the driving-shaft and independent thereof and of each other, a tubular shaft on each one of the buffing wheels surrounding the driving-shaft and rotatable thereon, a resilient spiral band for each one of the buffing shafts loosely surrounding the driving-shaft, one end of said spiral band being attached to the said tubular shaft, the other end of said spiral band being provided with an extension having a wedge-shaped face on one side thereof, a pivoted lever having a wedge-shaped end contacting with the wedge-shaped face of the band and projecting toward the adjacent

tubular shaft for moving said projecting end of the lever outward or inward, thereby tightening or loosening the spiral band upon the driving-shaft.

12. In a machine of the class described, a rotatable driving-shaft, buffing wheels located one at each end of the driving-shaft and independent thereof and of each other, a tubular shaft on each one of the buffing wheels surrounding the driving-shaft and rotatable thereon, a casing attached to said tubular shaft and projecting annularly around the driving-shaft, a resilient spiral band located within the said casing and loosely surrounding the driving-shaft, the other end of said spiral band being provided with an extension having a wedge-shaped face on one side thereof, a lever pivoted to said casing and having a wedge-shaped end contacting with the wedge-shaped face of the band and projecting out through said casing toward the adjacent tubular shaft, and a longitudinally shiftable ring rotatable with said tubular shaft adapted to engage with said lever to so move it that its wedge-shaped face will contact with the wedge-shaped extension of the spiral band to contract the same upon the driving-shaft.

13. In a machine of the class described, a driving-shaft and buffing wheels at each end thereof independent of the driving-shaft and of each other, each of said buffing wheels having a tubular shaft surrounding the end of said main driving shaft and projecting inward over the same, the exterior diameters of the ends of the driving-shaft and the interior diameters of the said tubular shafts being so proportioned that an oil space is left between the two, journal-bearings at each end of the machine in which the tubular shafts rotate, oil reservoirs on said journal-bearings each having a passage leading in said face adapted to register with the oil opening of the journal-box and leading to the inside of said tubular shaft, the driving-shaft being independently rotatable from each of said tubular shafts, and means whereby either or both of said tubular shafts may be thrown into or out of rotatable engagement with said driving-shaft.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this second day of January 1908.

ALFRED B. NUTTING.

Witnesses:

HARVEY R. NUTTING,

ARTHUR W. CHASE.