July 19, 1927.

1,636,557

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POLISHING MACHINE

Filed July 28, 1926

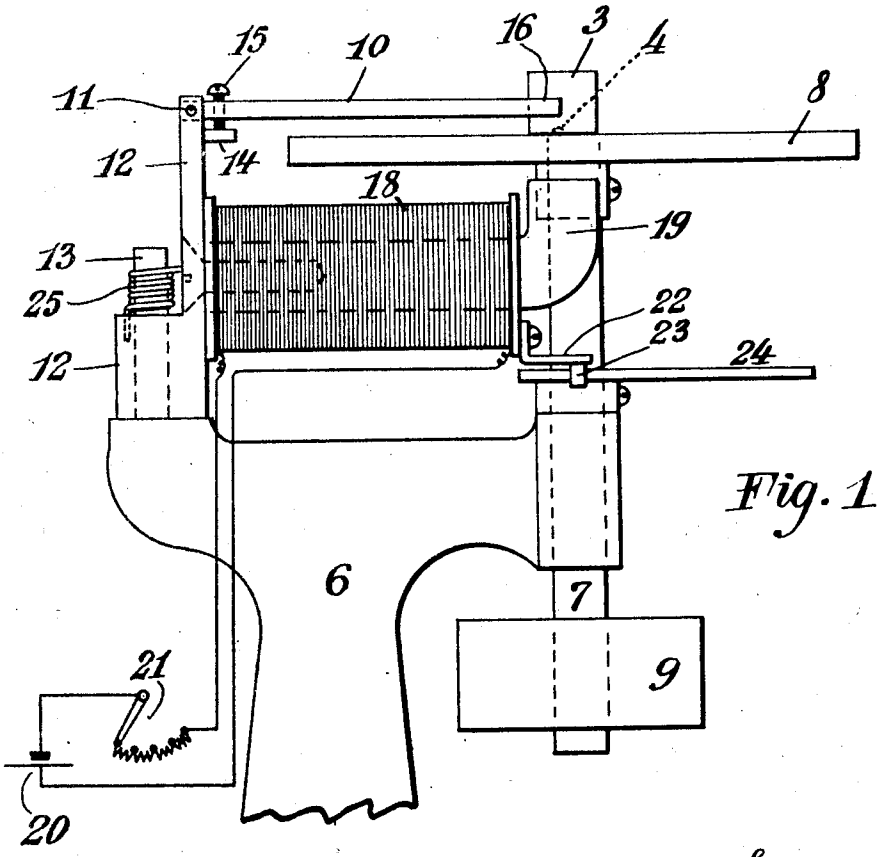


Fig. 1

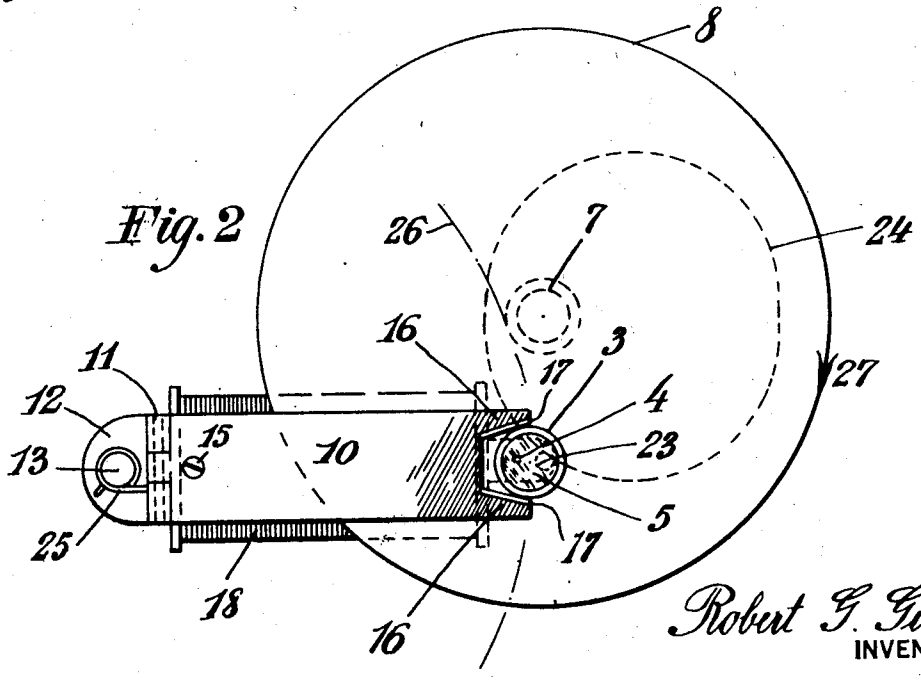


Fig. 2

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Patented July 19, 1927. 1,636,557

UNITED STATES PATENT OFFICE.

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POLISHING MACHINE.

Application filed July 28, 1926. Serial No. 125,386.

This invention relates to improvements in polishing machines particularly for laboratory and testing purposes, though the invention is not limited thereto.

When metals or other substances are to be tested microscopically or otherwise, a specimen is placed in a suitable holder and subjected to certain rough and fine grinding and polishing operations for the purpose of testing.

It is the object of this invention to provide a polishing machine or polishing unit adapted to polish such specimens in an efficient manner by means of a generally improved mechanism.

Another object of the invention is to provide a polishing machine or unit in which the specimen to be polished is held in correct position by electromagnetic means. Other objects will appear as this specification proceeds.

Accordingly the invention is embodied in a polishing apparatus constructed, arranged and operated as hereinafter set forth and as illustrated in the accompanying drawing in which

Figure 1 is an elevation of an apparatus embodying the invention with parts broken away.

Figure 2 is a partial plan view.

The specimen to be polished is usually held in a short piece or section of iron pipe by means of wax, cement or other like substance in which the specimen is embedded in such a manner that it can be polished on one of its faces or sides. In the drawing the reference numeral 3 denotes the specimen or work holder in the form of a piece of iron pipe about one inch long, more or less.

The specimen 4 is held in the work holder by cement 5. The apparatus comprises a support 6 in which there is mounted a shaft 7 which carries a polishing disk 8 of brass or other non-magnetic material. The shaft 7 is rotated rapidly by means of a pulley 9 to which suitable power is applied.

The work holder is held in position on the polishing disk by an arm 10 which is pivoted at 11 in an oscillating bearing 12 mounted on a pin or stud 13 fast in the support 6.

The arm 10 extends in over the disk 8 and rests by gravity on a lug 14 on which the arm is adjustable by means of a screw 15. The outer free end of the arm 10 forms jaws 16 lined with brass 17 or other non-magnetic material. To the bearing 12 there is secured an electromagnet 18 disposed in vertical alinement with the arm 10 and the end 19 of the core is bent upward and is located centrally beneath or in line with the space between the jaws 16. Electric current is supplied to the magnet from any suitable source 20, the strength of the current being regulated by a rheostat 21.

A short bracket 22 is secured to the magnet and carries a pin 23 adapted to run on an eccentric disk 24 fast on the shaft 7. A spring 25 is coiled around the pin 13 and suitably attached to the bearing 12 and the support 6. The spring 25 tends to swing the bearing 12, the arm 10 and magnet 18 towards the shaft 7 and keeps the pin 23 in contact with the eccentric in an obvious manner.

In Figure 2 the curved line 26 indicates the swinging movement of the outer free end of the arm 10. The arrow 27 indicates the direction of rotation of the disk 8.

The operation is as follows: The work holder 3 is placed on the disk 8 in the gap between the jaws 16 of the arm 10. Current is then turned on to energize the magnet 18. It will be seen that inasmuch as the bearing 12 and arm 10 are of iron, these elements together with the core 19 form a horseshoe magnet with the lines of force or strongest attraction passing through the points or ends of the horseshoe, which points are formed by the jaws 16 and the upturned end 19 of the core.

Consequently the iron work holder is attracted and pulled downward on or against the polishing disk 8. Power is then applied to the pulley 9 to rotate shaft 7. The polishing disk will therefore be rotated and turn rapidly under the specimen 4 polishing the same. The magnet and the electric current are of course calculated to pull down the work holder with such force as to provide the proper polishing friction between the specimen and the disk 8. During the operation, the work is being oscillated on the disk in the direction of the arc 26 to properly complete the polishing and to prevent the wearing of a groove in the disk, the oscillating movement being accomplished by means of the eccentric 24 and the pin 23 in an obvious manner.

The non-magnetic linings 17 in the jaws 16 compel the work holder 3 to remain in proper vertical position to position the work. Were the jaws unlined, the iron work holder

might be caught on either of the jaws 16 in an inclined position and the specimens would not be polished. But, as is obvious, not only is the work holder properly held in vertical working position by the magnet, but the work holder is forced laterally into the jaws by the action of the rotating polishing disk, thus preventing the work holder from being accidentally displaced.

The machine as herein disclosed is simple of construction and operation. It includes the necessary elements for proper adjustment and is highly efficient.

I claim:—

1. The combination of a work holder adapted to hold the work therein, a polishing element, electromagnetic means for keeping the work in frictional polishing contact with said polishing element and means for operating the polishing element.

2. The combination of a work holder adapted to hold the work therein, a polishing element, electromagnetic means for keeping the work in frictional polishing contact with said polishing element, means for operating the polishing element and automatic means for moving the work holder and work relative to the polishing element during the polishing operation.

3. The combination of a work holder adapted to hold the work therein, a polishing disk, co-operating electromagnetic and mechanical means for positioning the work on said polishing disk and means for rotating the polishing element to polish the work.

4. A polishing apparatus of the character described comprising in combination a work holder adapted to hold the work therein, a polishing disk, electromagnetic means for keeping the work in polishing contact with the said disk, non-magnetic means for positioning the work holder and work on the said disk, means for rotating the disk to polish the work and keep it in position in said non-magnetic means and means for automatically moving the work over said polishing disk during the polishing operation.

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