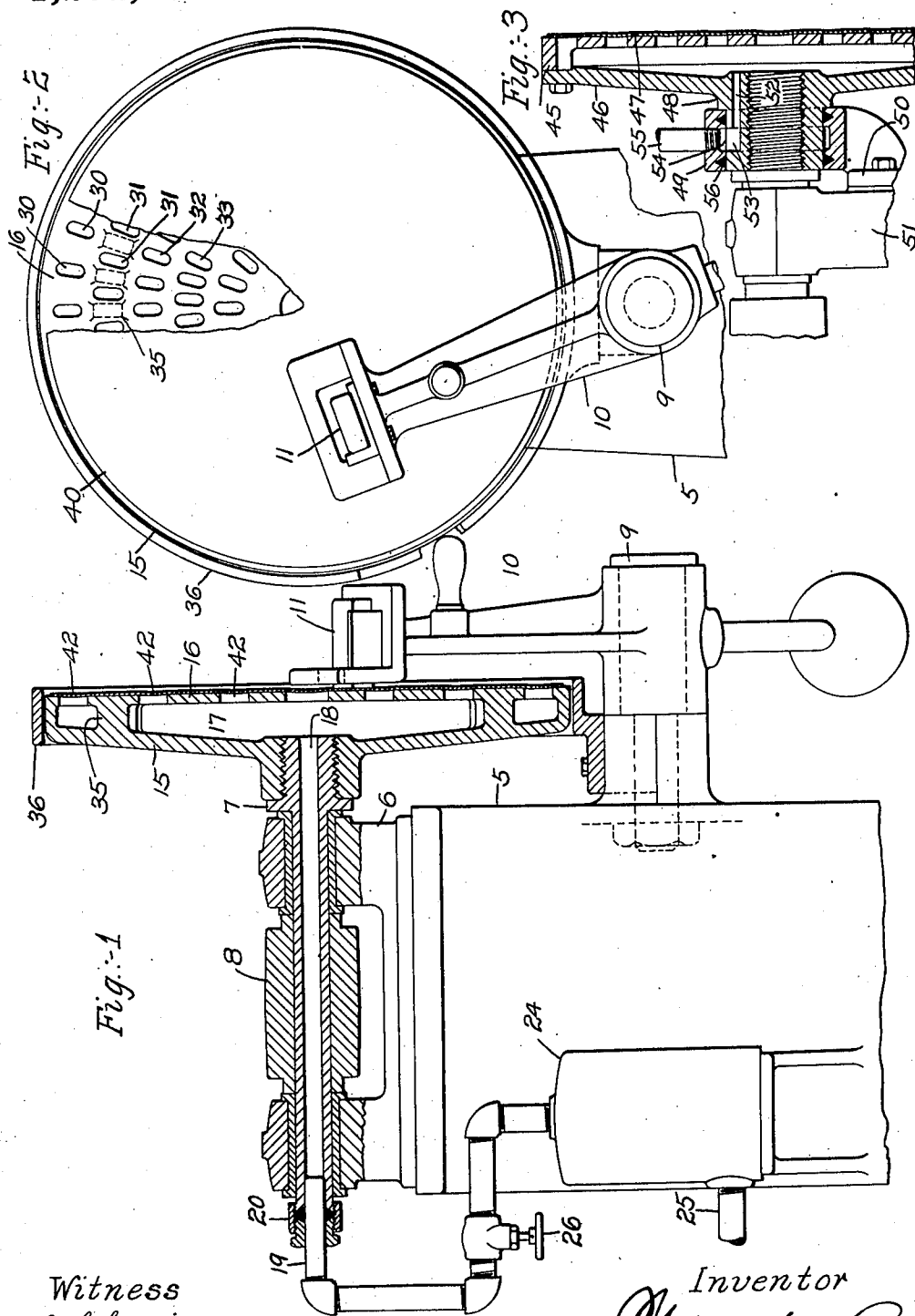


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DISK GRINDING MACHINE.
APPLICATION FILED JUNE 13, 1917.

1,291,572.

Patented Jan. 14, 1919.



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DISK-GRINDING MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, a citizen of United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Disk-Grinding Machines, of which the following is a specification.

This invention comprises an improvement in disk-grinding machines and consists in means for holding the abrasive disk to the face of the grinding disk.

Ordinarily the abrasive disks are glued to the metal grinding disks. This has to be done carefully in order that the surface will remain flat. It also consumes considerable time in attaching and drying. When a new disk is attached the old one must be removed, and the metal disks must be cleaned before attaching a new abrasive disk.

My invention comprises the combination of a perforated disk, means to rotate it, and means of exhausting air from the interior of the disk, for the purpose of holding the abrasive disk, on the outer face of the grinding disk.

Figure 1 shows a side view, partly in section, of disk grinding machine.

Fig. 2 shows partial front view of same.

Fig. 3 shows a modification of the invention.

5 shows an upright to which is secured a head 6, having suitable bearings for supporting the spindle 7 of the machine. 8 is the driving pulley for the spindle. 9 is a stud upon which an oscillating arm 10 is supported. This arm is provided with a suitable counterweight, and its other end supports a fixture for holding the work 11 to be ground.

Upon the end of the spindle 7 is placed the rotating disk 15, which has a front face 16, provided with a series of holes communicating with the hollow interior 17, of the disk.

The spindle 7 is made hollow as at 18, and at the rear end of this spindle a pipe 19 is inserted, suitable packing 20 is employed in order to make an air-tight joint between the pipe 19 and the hole 18.

The pipe 19 is connected to piping as shown, the other end of which is connected to an exhaust reservoir 24, which may be exhausted by suitable exhaust pump through the pipe 25. A globe valve 26 may be em-

ployed in the piping for closing the connection between the machine and the exhaust reservoir 24.

The holes 30, 31, 32, 33, etc., may be of any form desired and of any size desired. I prefer, however, to arrange them alternately as shown in the drawings.

In order to tie the outer face 16 of the disk to the narrow surface, I employ a series of connecting pieces 35, which are cast in the disk. Around the disk 15 is placed a guard 36 projecting beyond the disk 16, so as to hold the latter, in case the vacuum is accidentally lost.

The operation of this machine is as follows:

In order to attach the abrasive disk to the grinding disk, the machine is stopped and the disk, as at 40, is placed against the face of the disk. The pump is then started, air is exhausted from the reservoir through the piping and from the interior 17 and through holes in the disk. This will cause the disk to adhere firmly to the disk itself, even when rotating at high speed. The vacuum may be maintained continuously through the grinding operation.

The piece to be ground, as at 11, may be placed on the rocking arm and rocked forward against the surface of the abrasive disk.

To remove the abrasive disk all that is necessary is to stop the machine and the atmospheric pressure, when the disk can readily be taken away and another one can quickly be attached.

I prefer to make the holes in the disk of sufficient size, so that during the exhaust operation the abrasive sheet will sink slightly into the holes as shown at 42. These sunken surfaces then will not cut, but will make pockets for the accumulation of dust during the grinding operation, which, after these recesses have passed the articles to be ground, permit the dust to fly off.

When the disk has been worn out in one position, then it may be shifted slightly so that those portions which were opposite the holes will be supported by the flat surface of the disk between the holes. Consequently the abrasive disk may be used again. Those portions previously placed opposite the "lands", will curve downwardly to a very slight extent, into the holes, making pockets as before explained.

A modification of this device is shown in Fig. 3, in which the outer disk 45 is bolted to the carrying disk 46, the abrasive being shown at 47. This permits the disk to be
5 turned all over to balance it.

The means for exhausting the air from the disk is modified as follows:—

The hub 48 of the disk is turned down and surrounded by a bracket 49 secured at 50 to
10 the frame 51 of the machine. One or more holes 52 are bored from the interior of the disk through to the annular recess 53, which communicates with the annular recess 54,
15 around the bracket 49 with the pipe 55, connecting the recess 54 with the vacuum pump.

The operation of the machine is similar to that heretofore described, the air being

pumped out through the bracket 49 which may be provided with suitable packing as 56.

I claim as my invention:

1. In a disk grinding machine the combination of a perforated disk; means to rotate the disk and means for exhausting the air from the interior of the disk, for the purpose of holding an abrasive disk on the
20 outer surface of the grinding disk. 25

2. In a disk grinding machine the combination of a perforated disk, said disk being provided with a series of holes which are staggered; means for exhausting the air
30 from the interior of the disk for the purpose of holding an abrasive disk on the outer surface of the grinding disk.

WILLIAM A. LORENZ.