June 16, 1953 J. M. RADABAUGH 2,641,878

ABRADING UNIT

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Fig. 1

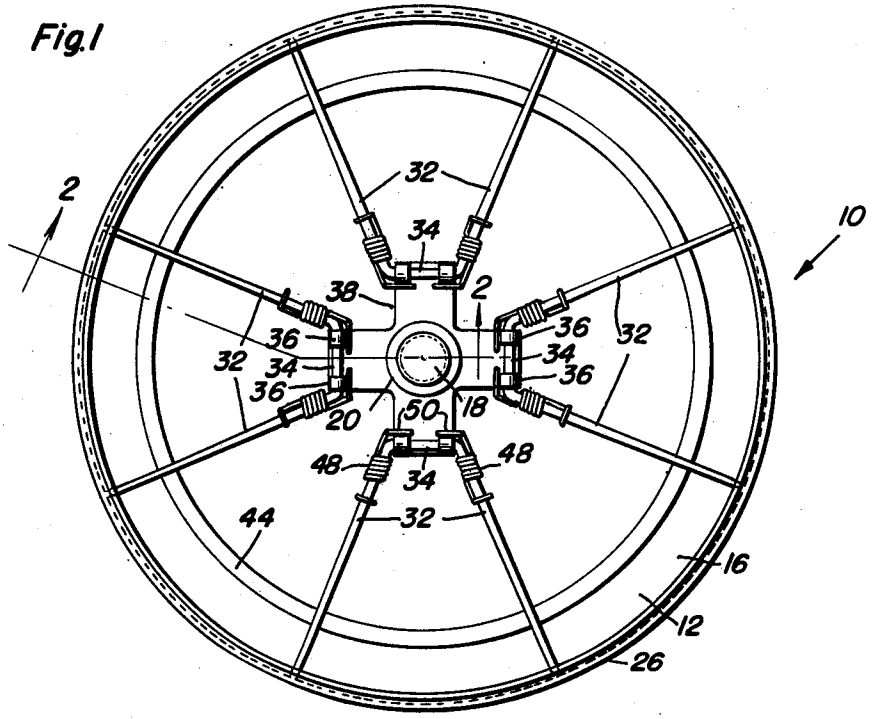


Fig. 3

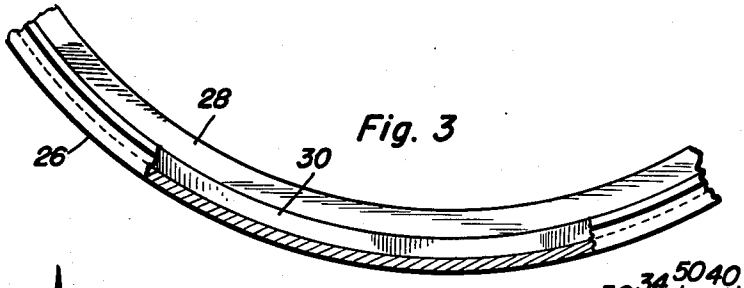


Fig. 2

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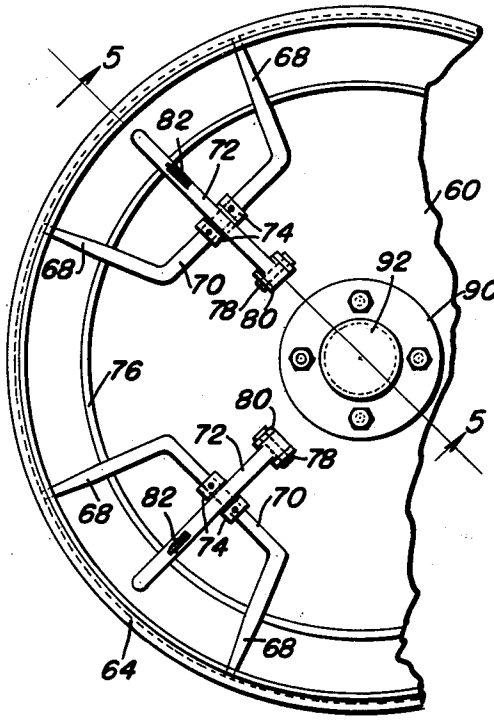


Fig. 4

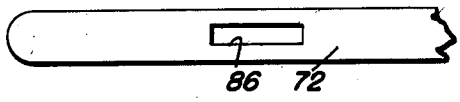


Fig. 7

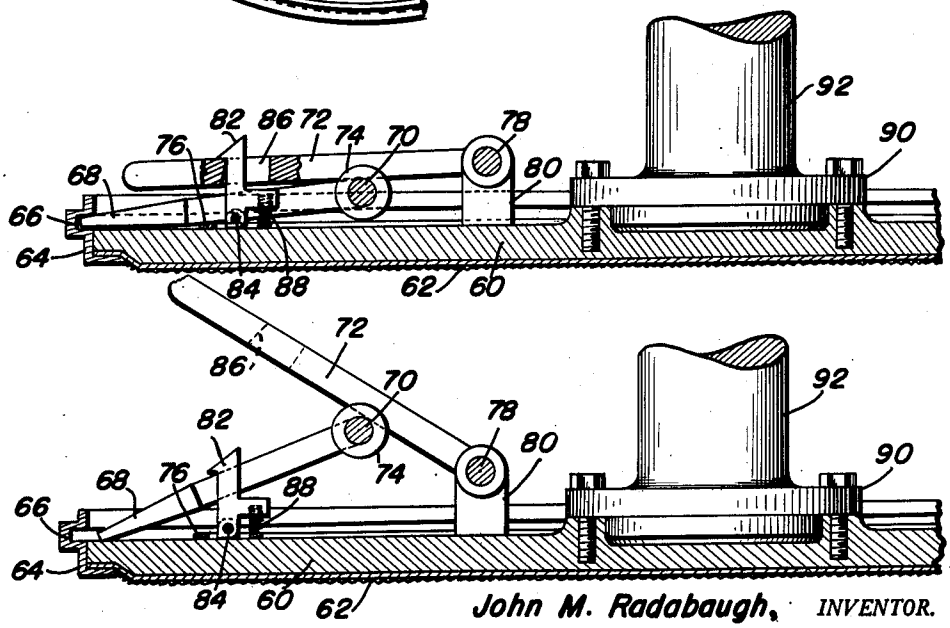


Fig. 5

Fig. 6

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2,641,878

UNITED STATES PATENT OFFICE

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ABRADING UNIT

John M. Radabaugh, Mount Vernon, Ohio

Application July 27, 1951, Serial No. 238,882

4 Claims. (Cl. 51—197)

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This invention relates to new and useful improvements and structural refinements in abrading units, more particularly, abrading devices wherein a sheet of abrasive material is mounted upon the face of a rotary disk, and the principal object of the invention resides in the provision of highly improved means for removably sustaining the abrasive sheet in position on such a disk.

Some of the advantages of the invention lie in its simplicity of construction, in its efficient and dependable operation, and its adaptability to economical manufacture.

With the above more important objects and features in view, and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is a rear elevational view of the invention;

Figure 2 is a fragmentary sectional view, taken substantially on the plane of the line 2—2 of Figure 1;

Figure 3 is a fragmentary view of the annular clamping member, partly broken away;

Figure 4 is a rear elevational view, partly broken away, illustrating a modified embodiment of the invention;

Figure 5 is a sectional detail, taken substantially in plane of the line 5—5 of Figure 4 and illustrating the unit in its clamped position;

Figure 6 is a sectional detail, similar to that shown in Figure 5, but illustrating the unit in its released position, and

Figure 7 is a fragmentary view of one of the levers used in the embodiment of Figure 4.

Like reference characters are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, more particularly to Figures 1, 2 and 3, the invention consists of an abrading unit which is designated generally by the reference character 10 and embodies in its construction a rotary disk 12 having a front face 14 and a rear face 16, the rear face of the disk being provided with an axial shaft member 18 which is screw threaded and carries an actuating nut 20 which will be hereinafter described.

A circular abrasive sheet 22 is positioned against the front face 14 of the disk 12 and the marginal edge portion of this sheet is disposed in a rearwardly offset, annular seat 24 with which the marginal edge portion of the front face of the

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disk 12 is provided, and the means for sustaining the sheet 22 in position on the disk 12 include an annular clamping member 26 which is disposed at the periphery of the disk 12 and is provided with an inturned, annular flange 28 to clamp the sheet 22 against the seat 24, as is clearly shown in Figure 2. The clamping member 26 projects rearwardly beyond the rear face 16 of the disk 12 and is formed with an annular groove 30 which is open at the inner side thereof, so as to receive therein the outer end portions of a set of clamping fingers 32. The fingers are disposed adjacent the rear face 16 of the disk 12 and are arranged in integral pairs, connected together by a bight portion 34 (see Figure 1), the bight portion of the several pairs of fingers being rotatively journalled in pairs of bearings 36 provided on a spider 38.

The spider 38 is rotatively mounted upon a diametrically reduced portion 40 of the aforementioned actuating nut 20 and is sustained thereon by a snap ring 42, and it will be observed that intermediate portions of the fingers 32 engage a fulcrum ring 44 provided on the rear face of the disk 12.

It will be apparent from the foregoing that when the nut 20 is tightened on the screw threaded shaft 18, the spider 38 will be forced downwardly toward the disk member 12 and, with the ring 44 acting as a fulcrum for the fingers 32, the outer ends of the fingers, seated in the groove 30, will press the clamping member 26 rearwardly as shown at 46, thus pressing the flange 28 and the edge portion of the abrasive sheet 22 against the seat 24.

On the other hand, when the actuating nut 20 is loosened on the shaft 18, the pressure of the clamping member 26 on the abrasive sheet 22 will be relaxed, and suitable springs 48 are positioned on the inner end portions of the fingers 32 and abut the spider 38 as at 50, so as to assist in relaxing the pressure of the clamping member on the abrasive sheet. In other words, the springs 48 are so configurated that they are placed under a lateral deflection when the nut 20 is tightened and, by tending to resume their initial position, the springs 48 cause the fingers to relax when the nut 20 is loose.

Referring now to the modified embodiment of the invention illustrated in the accompanying Figures 4—7 inclusive, the rotary disk 60 herein carries the abrasive sheet 62 on the front face thereof and is provided at its periphery with an annular clamping member 64 similar to the aforementioned member 26. The member 64 has an

annular groove 66 to receive outer end portions of pairs of fingers 68, the fingers in each pair being connected together by a bight portion 70 which is rotatably journalled in a suitable bearing provided intermediate the ends of a clamping lever 72.

Of course, a separate clamping lever is provided for each pair of the fingers, and suitable collars 74 are provided on the bight portion 70 at the opposite sides of the bearing on the clamping lever, to prevent the bight portion from sliding or shifting in its bearing.

The fingers 68 have intermediate portions thereof engageable with a fulcrum ring 76 provided on the rear face of the disk 60, and the inner ends of the levers 72 are rotatably journalled by means of transverse pins 78 in bearing brackets 80 affixed to the rear face of the disk.

As will be clearly apparent from Figures 5 and 6, when the clamping levers 72 are swung downwardly toward the disk 60, the outer ends of the fingers 68 will be projected into the groove 66 and, by virtue of the fulcrum ring 76, the clamping member 64 will securely hold the abrasive sheet 62 against the front face of the disk, while on the other hand, by swinging the levers 72 upwardly away from the disk 60, as shown in Figure 6, the outer ends of the fingers 68 will be withdrawn from the groove 66 and the clamping member 64 and the pressure of the latter on the abrasive sheet 62 will be relaxed.

Means are provided for locking the levers 72 in their clamping position, the means consisting of suitable hooks 82 which are pivoted as at 84 to the rear face of the disk 60 and are receivable in slots 86 with which the levers 72 are provided, suitable springs 88 being employed for pressing the hooks 82 into engagement with the levers 72 when the latter are in their clamping position.

The disk 60 may be mounted upon a flange 90 of a drive shaft 92 in any suitable conventional manner.

It is believed that the advantages and use of the invention will be clearly understood from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention what is claimed as new is:

1. In an abrading unit, the combination of a rotary disk having front and rear faces and a peripheral edge, a circular abrading sheet positioned on the front face of said disk, an annular clamping member disposed at the peripheral edge of the disk and movable forwardly and rearwardly relative thereto for clamping a marginal edge portion of said sheet against the front face of the disk said clamping member projecting beyond the rear face of said disk and being provided with an annular groove open at the inner side thereof, and means on the rear face of the disk and engaging said clamping member for moving the same forwardly and rearwardly, said means comprising a screw-threaded shaft member extending axially from the rear face of said disk, a spider movable longitudinally on said shaft member, a set of fingers having inner end portions thereof pivoted to said spider, a fulcrum ring on said disk and engageable with intermediate portions of said fingers, outer ends of the fingers being disposed in said groove, and an actuating nut provided on said shaft member and engaging said spider.

2. In an abrading unit, the combination of a rotary disk having front and rear faces and a peripheral edge, a circular abrading sheet positioned on the front face of said disk, an annular clamping member disposed at the peripheral edge of the disk and movable forwardly and rearwardly relative thereto for clamping a marginal edge portion of said sheet against the front face of the disk, said clamping member projecting beyond the rear face of said disk and being provided with an annular groove open at the inner side thereof, and means on the rear face of the disk and engaging said clamping member for moving the same forwardly and rearwardly, said means comprising a set of levers pivoted to the rear face of said disk, a set of fingers having inner portions thereof pivoted to said levers and outer ends disposed in said groove, and fulcrum means provided on said disk and engageable with intermediate portions of said fingers.

3. The device as defined in claim 2 together with means for locking said fingers in a clamping position.

4. In an abrading unit, the combination of a rotary disk having front and rear faces and a peripheral edge, a circular abrading sheet positioned on the front face of said disk, an annular clamping member disposed at the peripheral edge of the disk and movable forwardly and rearwardly relative thereto for clamping a marginal edge portion of said sheet against the front face of the disk, said clamping member projecting beyond the rear face of said disk and being provided with an annular groove open at the inner side thereof, means for moving said clamping member rearwardly, said means including radial fingers having outer ends engageable with said groove, a fulcrum ring secured to the rear face of said disk and engageable with an intermediate portion of each finger and mechanism operatively connected to the inner end of each finger to move the same toward the disk.

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