Feb. 28, 1950 F. P. FROESE 2,498,951

DISK GRINDING MACHINE

Filed April 30, 1947 2 Sheets-Sheet 1

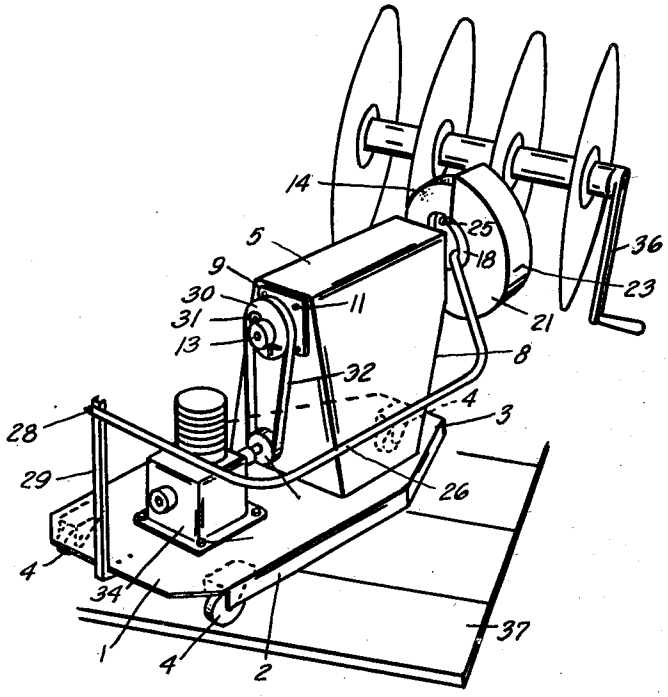


Fig 1

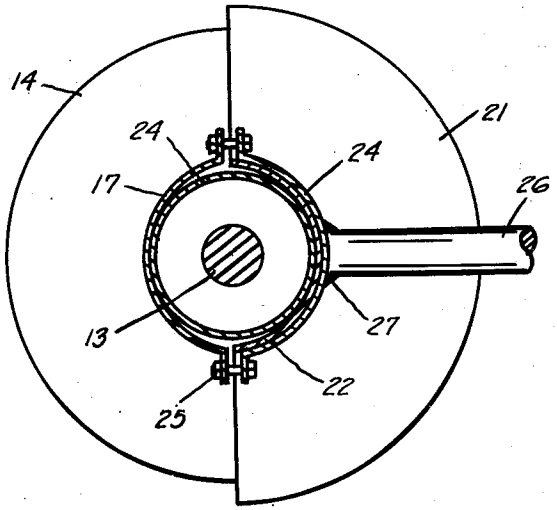


Fig 3

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DISK GRINDING MACHINE

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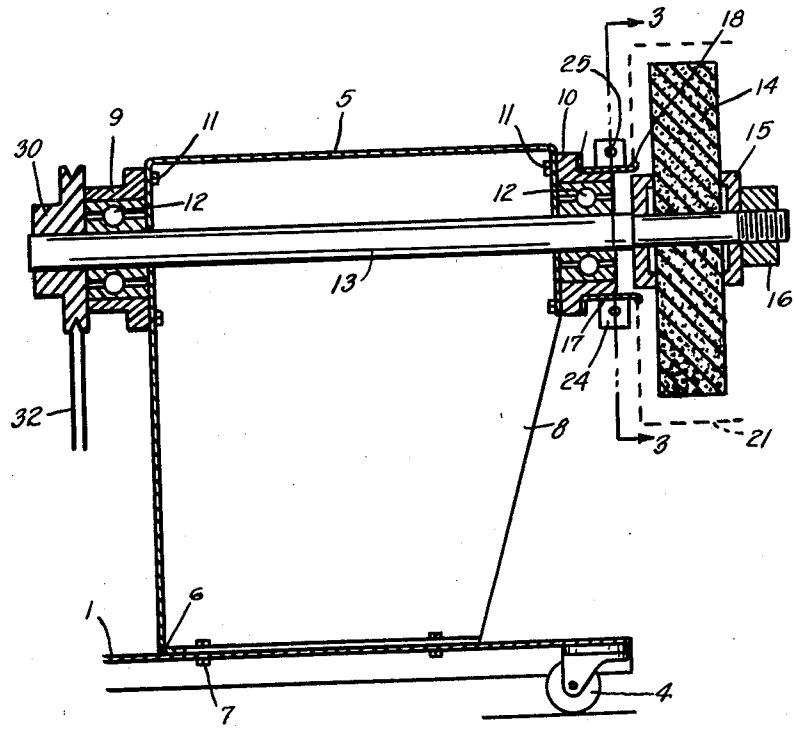


Fig 2

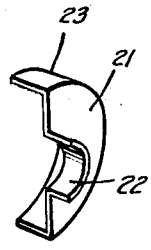


Fig 5

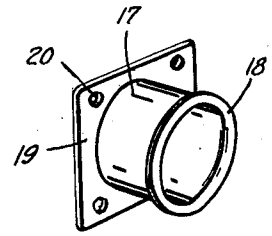


Fig 4

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DISK GRINDING MACHINE

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4 Claims. (Cl. 51—173)

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The invention relates to grinders, and more particularly to grinders for sharpening discs on disc plows, plow coulters, drill discs, disc harrows, cultivators, shovels and the like. In the ordinary sharpening of these implements, the discs are usually completely dismantled and sent to a blacksmith. When they are reassembled it is often found that they do not run free. This is due to the fact that in passing over the land the various strains and stresses encountered wear the bearings and other parts. When they are taken apart and then reassembled, it is almost impossible to position the various pieces in exactly the same place as they were originally, with the result that binding takes place at various points due to the previous distortion.

The principal object of the present invention is to provide a grinder mechanism which will sharpen the discs, above mentioned, while they are assembled on the machine and without requiring their dismantling.

A further object of the invention is to provide a grinder having free movability so that the same can be directed against the cutting edges of the discs as desired.

A further object of the invention is to provide a control handle for the grinder to direct same properly against the discs to be ground and said handle mounted for right or left operation.

A further object of the invention is to provide a guard for the grinder wheel to protect the operator from flying particles and said guard movable in respect to said grinder and operable by the control handle.

A still further object of the invention is to construct the device from pressed sheet metal for lightness and portability and of a simple design for cheapness of manufacture while being sturdy enough to stand hard usage over a long period.

A still further object of the invention is to construct the grinder for operation by either gas engine or electric motor power.

With the above important and other minor objects in view which will become more apparent as the description proceeds, the invention consists essentially in the construction and arrangement of parts hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of the machine in operation against a set of discs.

Figure 2 is an enlarged vertical sectional view through the driving mechanism.

Figure 3 is a vertical sectional view taken on the line 3—3, Figure 2.

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Figure 4 is a perspective view of the guard bearing bracket.

Figure 5 is a perspective view of the guard.

In the drawings like characters of reference indicate corresponding parts in the several figures.

A base member 1 is composed of sheet metal, the sides being bent downward, as shown at 2 and the front formed in a relatively tapered shape, as at 3. The base member is supported on three castor wheels 4, two being at the back and one at the front. A casing 5 is mounted on the front portion of the base. This casing is preferably formed from sheet metal, and with a slight upward and inward taper. The lower edges are bent inward as at 6 and are suitably bolted as at 7 to the base. The rear portion of this casing is vertical and closed while the front portion is open except at the top. The front edges are provided with a slight backward slant as indicated at 8.

A pair of cast boxings 9 and 10 are mounted at the upper rear and at the upper front of the casing and on the exterior thereof. These boxings are held thereto by bolts 11 passing through the casing. A ball bearing 12 is mounted within each of the boxings. These ball bearings support a grinder shaft 13 which passes lengthwise through the casing 5. The forward end of the shaft 13 receives an abrasive wheel 14 which is mounted between a pair of clamping discs 15 which are locked to the shaft 13 by a nut 16 screwed to the end thereof.

A guard bearing 17 is shown in Figure 4. This comprises a tubing having an encircling edge flange 18. The opposite end of the tubing is formed integral with a square plate 19 having holes 20 at the corners thereof. This bearing is received over the circular portion of the boxing 10 and the bolts 11 holding said boxing pass through the holes 20 in the bearing to retain same to the boxing. The bearing bracket 17 in this position, extends over one of the clamping discs 15 but is clear thereof so that the grinder wheel 14 may revolve without contact. A guard 21, shown in Figure 5, is of a semicircular shape. This guard has a semicircular hub 22 which is received on the bearing bracket while the outer edge 23 is adapted to overlie the abrasive wheel 14. The flange 18 of the bearing bracket prevents the guard from moving toward the wheel. This guard is indicated in dotted outline in Figure 2 to show its relative position on the guard bearing. The hub 22 of the guard is of a slightly larger radius than that of the guard

bearing 17 as shown exaggerated in Figure 3. This is for a purpose which will be later described.

A pair of clamping straps 24 pass around the guard bearing and over the hub 22 of the guard and the ends of these straps are fastened by bolts 25 to retain the guard thereon. A control handle 26 formed from a tube or bar is welded as at 27 to one of the clamping straps 24 and at an angle. This handle passes outward from the machine, then curves and runs parallel therewith and then curves back and is pivotally bolted at 28 to the standard 29 extending upward from the rear of the base member 1. It will be noticed that this pivot point is aligned with the center of the grinder shaft 13.

From the above it will be seen that due to the hub 22 being of a larger radius, the clamping members 24 press the guard bearing 17 on diametrically opposite sides. At the same time, the friction of these clamps is sufficient to hold the guard therewith so that if the handle 26 is rotated over the machine to the other side the guard will rotate therewith on the guard bearing. Accordingly, the grinder wheel will always be clear for contact against the work to which it is pressed. At the same time, if the machine is to be used for grinding a small article or other types of work the handle 26 can be held with one hand while the operator can rotate the guard where desired as the friction is not sufficient to hold it rigid to the handle. This is a very handy construction where time is of the essence.

The end of the shaft 13, after passing through the boxing 9, is provided with a V-belt pulley 30 which is fastened thereto by a cotter pin 31. A V-belt 32 passes over this pulley and down to the drive pulley 33 carried by the shaft of a motor 34. This motor may be gasoline driven, electric, or any other source of motive power and is suitably fastened as by bolts 35 to the base member.

In using this machine to sharpen discs, the frame of the implement is first mounted on suitable blocks so that the discs thereof are free to rotate and clear of the ground. If the shaft of these discs is bent to prevent such rotation or for any other reason, a suitable crank 36 can be attached to the shaft so that the discs can be manually rotated. A wooden platform 37 is provided and placed adjacent to the discs to be ground and this platform forms a convenient and smooth support for the grinding machine so that the castors can freely roll the machine thereover.

In operation the operator starts the motor and then grasps the handle 26. The grinding wheel is positioned at an angle to the periphery of the discs and then pressed thereagainst. The friction produced by the grinding action causes the disc shaft and all the other discs to rotate thus providing a fresh surface against the abrasive wheel. This continues until that particular edge of the disc is ground to the operator's satisfaction. The wheel is then moved to the next disc and the operation repeated. When one side of the said discs have been completed the operator then swings the handle 26 over the machine and the guard follows. The grinder is then rolled to bring the machine to the correct angle for sharpening the other side of the discs and the abrasive wheel is then pressed thereagainst. The complete set of the discs can be ground until a satisfactory edge is provided and if the discs do not rotate freely enough or too freely, a second operator can rotate the crank 36 as desired to accomplish the result required.

From the above it will be apparent that I have produced a very simple machine for the purpose which fills a long felt want by farmers in general. The fact that the discs of the farm implements previously mentioned can be ground without being removed from the machine offers a tremendous saving both in time and in costs. The machine, being carefully designed from sheet metal is very cheaply constructed, is light and avoids the cost of heavy castings and has no superfluous parts. The ball bearing mountings eliminate friction and thus permit maximum power delivery to the grinding wheel and by providing the machine with the V-belt drive, various types and shapes of motors with varying heights of drive shafts can be mounted on the base member and quickly connected for driving purposes. The control handle being mounted centrally of the drive shaft, is free to be operated from either side of the machine so that many normally inaccessible points can be handled with ease. As the guard member follows the handle in its rotation, no time is lost in contacting the abrasive wheel with the work. This guard, being also manually rotatable permits the operator to quickly use the abrasive wheel for many types of work outside of the particular job for which it is designed. Very little can go wrong with this machine and the abrasive wheel is so mounted that it can be quickly replaced when worn out.

When drill discs or plow coulters are to be ground, they have to be removed from the machine. These discs, when on the implements, have individual frameworks of their own and are not carried on a single shaft. The operator simply removes the pins which hold the units to the machine, the frame and discs are then removed and the edges of the discs are placed against the grinding wheel, the operator holding the frame. The grinding friction rotates the discs in the same manner as described for the other discs in the specification. When one side is done, the frame is turned over and the opposite side can then be ground. The frames are then positioned back on the machine and the pins replaced.

What I claim as my invention is:

1. In a grinding machine having an abrasive wheel mounted on a power driven shaft and said wheel partly encircled by a guard; means for moving said guard around said abrasive wheel, comprising: a bail shaped control arm having the ends mounted for aligned rotation with said shaft for movement of said arm from one side of said machine to the other; and frictional means connecting said guard with said control arm.

2. In a movable grinding machine having an abrasive wheel mounted on a power driven shaft and said wheel partly enclosed by a guard; means for directing said wheel against the work to be ground, comprising: a bearing around said shaft adjacent said wheel; the hub of said guard mounted on said bearing; a bail shaped control arm having the ends thereof mounted for aligned rotation with said shaft for movement of said arm from one side of said machine to the other; and one end of said arm frictionally clamped over the hub of said guard.

3. In a bearing supported abrasive wheel, having a guard partly enclosing same; means for controlling the rotation of said guard around said abrasive wheel, comprising: a hollow spool member secured to said bearing, adjacent to and centrally of said abrasive wheel; a hub on said guard, receivable over said spool member and rotatable

thereon; and a manually operable control arm clamped to said guard hub and rotatable with said guard hub around said spool member.

4. A disc grinding machine, comprising: a caster supported flat base member having a standard projecting upwardly at one end; a hollow casing supported on the opposite end of said base member with the upper end projecting thereover; a shaft passing lengthwise through said upper end of said casing, mounted in end bearings thereon, and driven by a motor supported on said base member; an abrasive wheel mounted on the casing-projecting end of said shaft, clear of said base member; a guard partially encircling said abrasive wheel, having a hub rotatably mounted on one of said bearings adjacent said abrasive wheel; a bail-shaped manually operable control arm, having one end connected to said hub and the other end pivotally mounted on said standard in alignment with said shaft, for rotation of said bail-shaped arm from one side of said member to the other.

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