





## UNITED STATES PATENT OFFICE

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## GRINDING AND SHARPENING MACHINE

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2 Claims. (Cl. 51—109)

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This invention relates to tool grinding or sharpening machines and is directed particularly to improvements in portable machines for grinding or sharpening small tools or implements such as knives, scissors and the like.

An object of the present invention is to provide a compact grinding machine of a size to be conveniently carried in the trunk compartment of an automobile and which may be operated by a small air cooled gasoline motor or an electric motor operated by the automobile storage battery.

Another object is to provide a grinding machine of the character set forth in which horizontal and vertical grinding wheels are supported in a novel manner upon a frame to be driven simultaneously by the operating motor, which is also carried by the frame.

A further object is to provide in a machine of the character stated, a novel vertical shaft mounting for a grinding wheel which is rotated in a horizontal plane.

Other objects and advantages of the present invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawing:

Figure 1 is a view in top plan of a grinding machine constructed in accordance with the present invention.

Figure 2 is a side elevation of the same.

Figure 3 is a view of the machine partly in end elevation and partly in section.

Referring more particularly to the drawing it will be seen that the parts of the structure are mounted in a substantially rectangular, skeleton housing which is generally designated H. This housing comprises a top frame 10, a bottom frame 11 and vertical, corner uprights 12, which join together the top and bottom frames at their four corners, as shown.

The elements of the housing are preferably angle bar members joined together by welding, whereby a rigid and strong structure results.

While the skeleton housing has been described as being of rectangular form, it is to be understood that it may be made square, if desired, and it may also be made of other material than angle iron.

Extending lengthwise of the top frame 10 ad-

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jacent to and paralleling one side thereof is a rail 13 which supports a bearing block 14. A corresponding bearing block 15 is supported upon the adjacent side of the frame 10 as shown and these blocks have extending therethrough and rotatably supported thereby a horizontal shaft 16.

The outer end of the shaft 16 has secured thereto, and supports for rotation in a vertical plane lying outside the adjacent side of the housing, a grinding wheel 17, preferably of Carborundum.

The inner end of the shaft 16 carries a pulley wheel 18.

Supported in the housing, in a suitable manner, as shown, is a motor which is generally designated 19. This motor is conventionally illustrated, since the particular type is immaterial. It may be in the form of a small, air cooled gasoline motor supplied with fuel from an adjacent tank 20, or it may be an electric motor of a size to be driven from the storage battery of a motor vehicle, the machine being designed, as before stated to be carried in a motor vehicle trunk compartment.

The motor 19 has a shaft 21, on which are secured the two pulleys 22 and 23.

The pulley 23 is coupled with the pulley 18 by a belt 24.

In the end of the housing remote from the motor 19, is mounted a vertical tubular shaft housing which is generally designated 25.

The shaft housing 25 may be made up of standard plumbing parts and comprises two pipe sections 26, of two inch size, this being found to be the most satisfactory size, although any other size may be used, and a corresponding size T coupling 27 by which the two pipe sections are connected together in alignment.

The leg 27' of the T, is directed horizontally, laterally and it has press fitted therein, a bearing 28, in which is supported a short shaft 29.

Within the shaft housing, in the coupling 27 thereof, is a miter gear 30, secured on the shaft 29.

Outside the shaft housing, the shaft 29 carries a pulley wheel 31. This pulley wheel 31 has driving connection with the motor shaft carried pulley 22, by a belt 32.

The lower pipe section 26 has its lower end secured in a collar 33 which is secured by welding or in any other suitable manner, to the adjacent part of the bottom frame 11.

The top end of the upper pipe section 26 is likewise secured in a collar 34, which is welded or otherwise secured to the adjacent part of the top frame 10. This collar 34 is flush at its top end with the top end of the pipe section to which



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it is secured and a cover plate or cap 35 closes the top end of the pipe section as shown.

In the remote ends of the shaft housing 25, are secured the upper and lower shaft bearings 36 and 37 respectively.

Through these bearings 36 and 37 extends the vertical shaft 38. The upper end of the shaft 38 extends through a suitable opening in the plate 35 and above the plate, and has secured upon its top end a grinding wheel 39.

The shaft 38 is supported by a step bearing at its lower end which comprises a step plate 40 secured in and across the lower collar 33; a ball socket 41 secured upon the lower end of the shaft 38, below the lower bearing 37 and a bearing ball 42 engaged in the socket 41 and resting in a shallow depression 43, in the top of the step plate 40. Thus the shaft 38 is held upright by the encircling bearings 36 and 37 and supported by the step bearing ball 42, so that it may rotate with a minimum of friction.

Driving power is delivered from the motor to the shaft 38 by the miter gear 44, secured on the shaft 38 and having toothed connection with gear 30.

From the foregoing it will be readily apparent that there is provided by the present invention, a grinding machine of unique construction, which provides grinding wheels rotating in two planes for the easy and rapid performance of any type of grinding operation.

I claim:

1. A grinding machine of the character set forth comprising a housing, a motor unit supported therein and including a shaft, a pulley on the shaft, a tubular shaft housing disposed vertically in the first housing and comprising two aligned pipe sections and a T union joining the pipe sections together, the union having a horizontally disposed leg, a bearing fitted in said leg,

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a shaft extending through and supported by said bearing, a bearing in each of the remote ends of said pipe sections, a vertical shaft extending through the bearings in the pipe sections and having its top end projecting above the upper pipe section, gears carried by and operatively coupling the two last named shafts in the union, a step bearing beneath the lower end of the vertical shaft, a pulley wheel upon the outer end of the shaft extending through the horizontal leg of the union, a belt coupling between said pulleys, and a grinding wheel upon the top end of the vertical shaft.

2. A grinding machine as set forth in claim 1, with a collar secured upon the lower end of the lower pipe section, the said step bearing comprising a ball bearing socket upon the lower end of the vertical shaft, a plate secured across the interior of said collar below said socket and having a depression in the top surface thereof, and a bearing ball in said socket and resting in said depression.

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