July 11, 1933. L. SCHULTE 1,917,906

MOUNTING FOR HAND GRINDING DEVICES

Filed Aug. 29, 1930

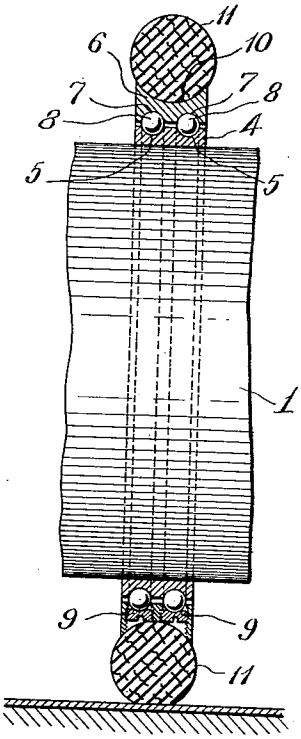


FIG. 4.

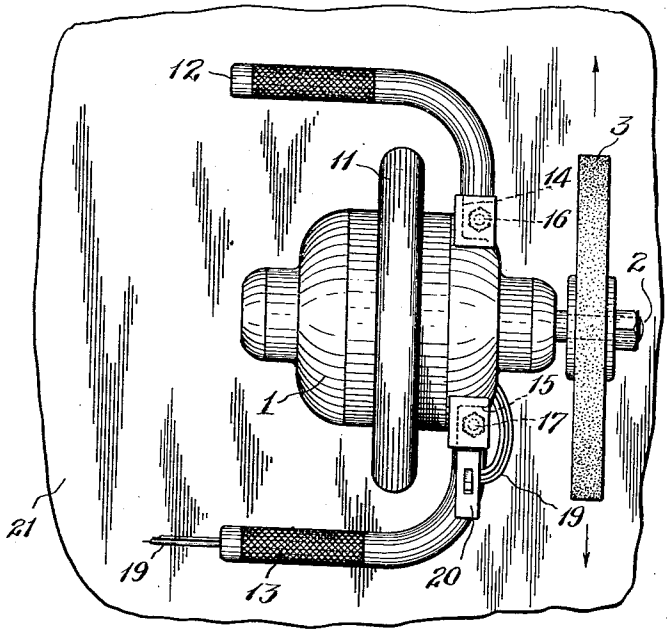


FIG. 2.

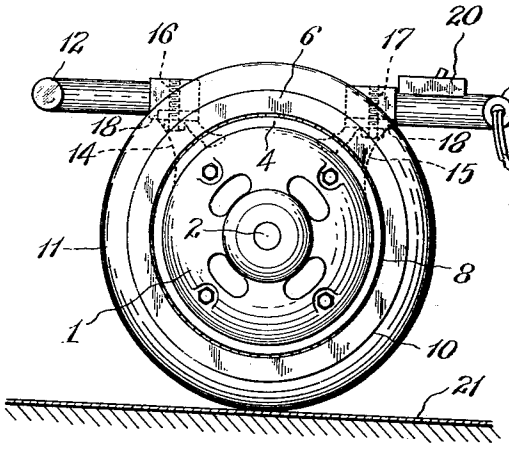


FIG. 3.

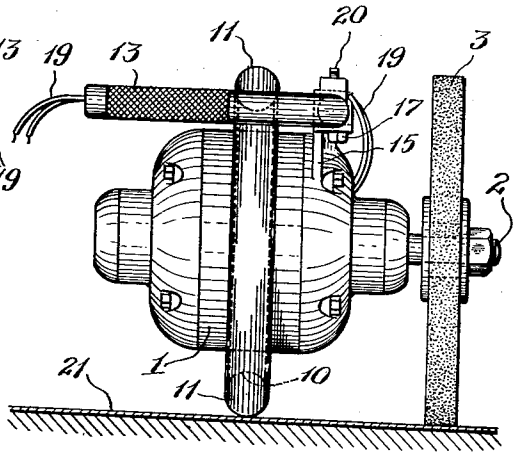


FIG. 1.

INVENTOR:
LOUIS SCHULTE
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UNITED STATES PATENT OFFICE

LOUIS SCHULTE, OF BRACKENRIDGE, PENNSYLVANIA, ASSIGNOR TO ALLEGHENY STEEL COMPANY, A CORPORATION OF PENNSYLVANIA

MOUNTING FOR HAND GRINDING DEVICES

Application filed August 29, 1930. Serial No. 478,640.

This invention relates to apparatus used in the art of grinding or surfacing of sheets or strips of material especially of the thinner gauges, and is particularly adapted for removing deep pit, tool or other marks in steel or other metal to be ground or polished. These marks are usually removed by hand grinding before the entire sheet or strip is subjected to its final grinding or polishing operation.

Heretofore great difficulty has been experienced in removing these deeper marks from sheets, strips and other material and getting an even and smooth surface.

Heretofore it has also been difficult to feed a grinding wheel in a straight line so as to prevent the formation of grinder marks across the grain which constitute additional defects and are removed only with great difficulty.

This hand grinding has usually been done by a rather heavy portable grinder which had to be lifted by the operator.

The general object of my invention is therefore, to produce a grinding device which will be especially adapted to remove pits, tool marks and other objectionable surface defects from sheets, strips, or other flat surfaces.

Another object of this invention is to produce a grinding device which can be supported while the device is grinding whereby the operator is relieved of the necessity of lifting a heavy weight while grinding and whereby he is enabled to control the grinding operation in a very sensitive manner.

Another object of this invention is to produce a support for a grinding device adapted to rest on the sheet or material being ground which will not mark, indent or deface the finished surface of the material.

Another object of this invention is to provide a rolling support for a hand grinding device which will tend to roll the grinding unit parallel to the plane of rotation of the grinding wheel. Another object of this invention is to provide a support for a hand grinding unit which will permit the lateral movement of the entire grinding unit, and which will permit the tilting of the unit and which will permit the rotation of the entire unit about its axis.

Another object of this invention is to produce an antifriction mounting for a carrying wheel for a grinding device which will be simple and durable in construction.

Another object of this invention is to produce a carrying wheel which will be soft and resilient and which will prevent slippage of the grinding unit on smooth, polished surfaces being treated.

Another object of this invention is to produce a carrying wheel for a hand grinder unit which will be of substantially the same diameter as the grinding wheel and which will permit the grinding operation to be performed with the axis of the grinding wheel substantially parallel to the plane of the surface being ground.

Another object of this invention is to provide a mounting for a hand grinder of the character set forth, which is extremely simple in construction, strong and sturdy, and inexpensive to manufacture.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts, throughout the several views, and in which:

Figure 1 is a side elevation of this improved grinding device and mounting.

Fig. 2 is a plan view of the device illustrated in Figure 1.

Fig. 3 is a rear end elevation of the device illustrated in Fig. 1, this view being taken from the left side of Fig. 1; and

Fig. 4 is a vertical axial section through the carrying wheel forming a part of my invention, a fragmentary portion of the motor being shown in elevation.

Referring to the drawing, 1 represents the driving element of this improved grinding device, which is preferably an electric motor, provided with the usual shaft or spindle 2,

upon which a grinding wheel 3 is mounted in any desired manner. This grinding wheel may be of any desired material or construction and is to be selected to best suit the purpose for which it is to be used. The motor 1, shaft 2 and wheel 3 constitute a usual portable grinding unit.

For the purpose of supporting this grinding unit, a collar or inner ball race 4, Figure 4, is fixedly mounted upon the barrel of the motor. This ball race is preferably formed with one or more grooves 5. Encompassing this ball race 4 is another collar or outer ball race 6 likewise formed with grooves 7 equal in number to and aligned with the grooves 5. Interposed between the races 4 and 6 and nested in the grooves 5 and 7 are a plurality of balls 8 which are inserted through the plugged openings 9 as will be readily understood. The outer face of the outer race 6 is formed with a concave periphery or seat 10 as will be apparent from the drawing. Mounted in the concave periphery is a relatively soft annular member 11. This member is preferably made of an endless rubber tire of suitable hardness but may be made of any other suitable material, which has the desired properties.

For the purpose of guiding this grinding unit and controlling the grinding I provide two handle members 12 and 13, which are suitably bent and are each securely fastened to one of the brackets 14 and 15 on the motor by means of bolts 16 and 17 respectively. It will be noted that the grips of the handle members are parallel to the axis of the motor. The ends of the arms are each formed with a shoulder 18 at the point of attachment to the brackets 14 and 15 so as to prevent angular movement of the handles as will be understood. One of the handles, 13, is preferably hollow so as to afford passage therethrough for wires 19 carrying current to the motor. A suitable switch 20 is mounted on handle 13 in a convenient position for the operator to start and stop the motor.

The motor 1 is preferably a standard motor and the brackets 14 and 15 are two of the four feet with which standard motor frames are usually provided. The other two feet at the rear of the motor have been removed in the device shown on the drawing, although these feet might be left on without interfering with the operation of the device in any manner.

The annular member or tire 11 must be soft and yielding so that it will not mark or scratch the surface which, in some case, has a very high degree of polish and which would be irreparably damaged by a scratch. In addition it is important, especially in treating thin sheets of certain materials, such as stainless steel, for instance, that the material of this annular member 11 be yielding so that it will distribute the load over a relatively large area so that the material which is being treated will not be scored or indented. The surface of this member 11 must further present a friction surface to the material so that the grinding unit will not skid or slide during the grinding operation.

This improved mounting for a grinding unit is especially adapted for removing pits, scratches or other surface defects from relatively thin flat sheets or strips, either prior to, or subsequent to the final finishing of such sheets. The drawing illustrates this improved mounting in operative relation to such a sheet of metal indicated at 21.

In using this device the operator rests the tire 11 upon the plate 21 and starts the motor, holding the grinding unit by the grips on the handle member 12 and 13 and keeping the bottom of the wheel 3 somewhat above the plate. The operator then tilts the unit until the bottom of the periphery of the grinding wheel contacts the plate at the desired place. He then guides the grinding unit in the direction indicated by the arrows in Figure 2 which is preferably parallel to the grain of the material being ground or finished, until the surface defect has been eliminated. It will be noted that the construction of the mounting is such that it is relatively easy to feed the grinding unit parallel to the plane of rotation of the grinding wheel. This is aided by the fact that the plane of the carrying wheel is fixed with relation to the axis of the grinding unit and is parallel to the plane of the grinding wheel and that therefore, the tendency of the carrying wheel is to move the grinding unit parallel to itself. It should also be noted that the motor and the handle members are rotatably mounted on the supporting tire 11 and that there is therefore no tendency of the hand farthest from the operator to swing around horizontally as he reaches the end of the grinding stroke because the outer handle may be raised upwardly to compensate for the stretching of the operator's arm. It will also be evident that the operator's control over the location, amount and quality action will be much more sensitive due to the fact that he need exert little or no physical effort to lift the weight of the motor and may direct all of his energy to the grinding action. This feature has the additional advantage that a larger and more powerful motor may be used for grinding which has certain well known advantages. The fact that the supporting tire 11 will not injure the surface and will not slip on the surface, also provides this unit with a stability which is conducive to accurate grinding work.

While the wheel 3 has been referred to as a grinding wheel, it is to be understood that this wheel may be replaced by any wheel which may be used for similar operations,

such as a polishing or buffing wheel and that the wheel may be constructed of any material desired and in any manner deemed advisable for the work at hand. While the use of this apparatus has been described as applied to the hand grinding of relatively thin sheet metal, it will be understood that this device may be used with equal advantage in the finishing and removing of defects from thin strips or other shapes suitably mounted on a flat table or from relatively flat surfaces of any kind.

While I have described the preferred embodiment of my invention, it must be understood that I do not limit myself to the specific construction therein shown, as various changes and modifications may be made in the construction of the mounting for the hand grinder without departing from the spirit of this invention or the scope of the appended claims:

What I claim as new and desire to secure by Letters Patent is:

1. In a hand grinding device, a power driven grinder unit comprising a grinder wheel and a motor, a carrier wheel encompassing said motor and adapted to support said motor, and anti-friction means interposed between said carrier wheel and said motor.

2. In a hand grinding device, a motor containing casing, an inner race member fixedly mounted therearound, an outer race member having a concave outer face, both said races having registering opposite grooves, anti-friction members in said grooves and a tire member seated in the concave face of said outer race member.

3. In a hand grinding device, a motor containing casing, an inner race member fixedly mounted therearound, an outer race member having a concave outer face, both said races having registering opposite grooves, anti-friction members in said grooves and a tire member seated in the concave face of said outer race member, grinding means associated with said motor, said tire and grinding means being parallel and axially aligned.

In testimony whereof, I have hereunto subscribed my name this 21st day of August, 1930.

LOUIS SCHULTE.