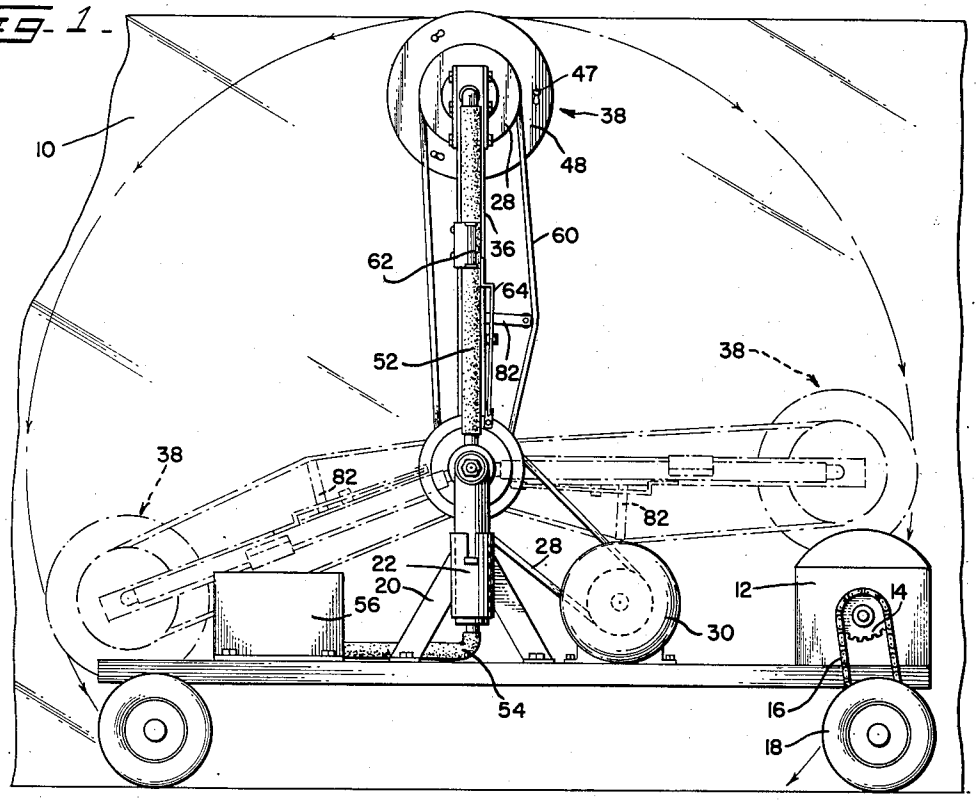
April 1, 1958 R. P. MILLER 2,828,587

ABRASIVE DISC MACHINE FOR RESURFACING SLATE, WOOD, METAL, PLASTICS, OR THE LIKE

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Fig. 1.



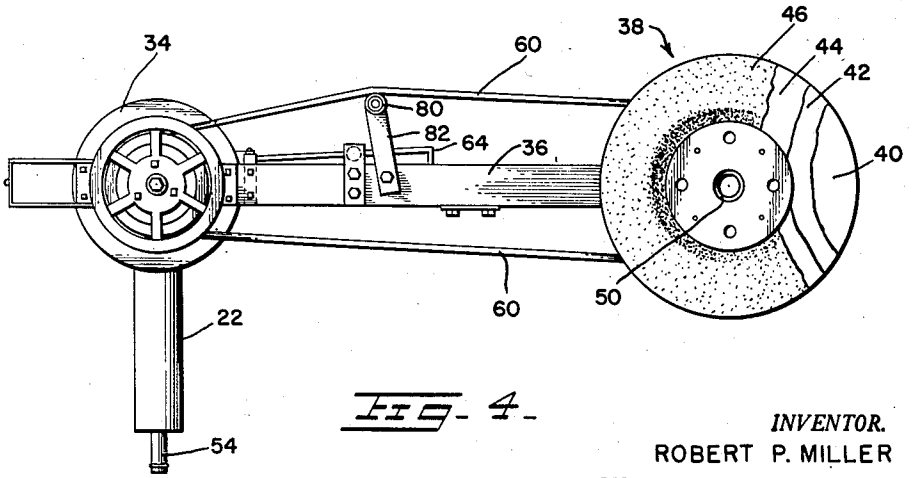


Fig. 4.

INVENTOR.
ROBERT P. MILLER
BY
A. Hamlin Hodges
ATTORNEY

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Fig. 2.

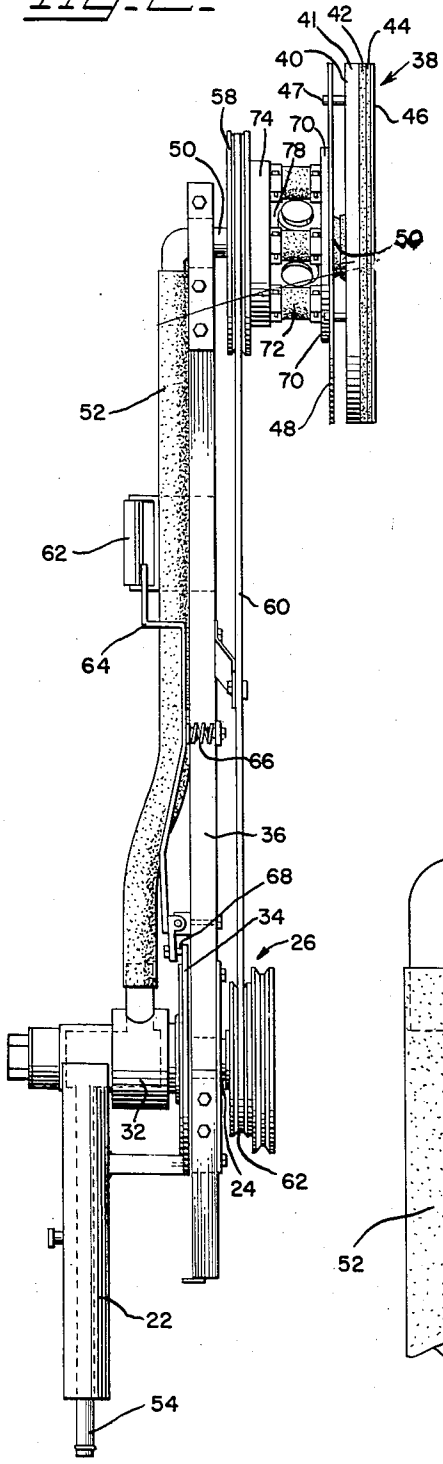
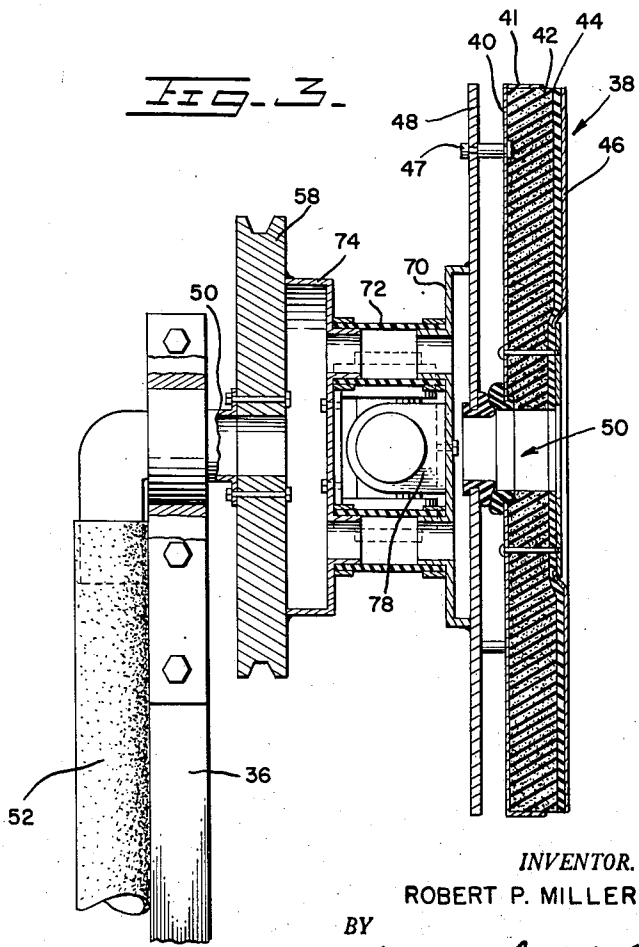


Fig. 3.



INVENTOR.

ROBERT P. MILLER

BY

H. Hamlin Hodges

ATTORNEY

United States Patent Office 2,828,587
Patented Apr. 1, 1958

2,828,587

ABRASIVE DISC MACHINE FOR RESURFACING SLATE, WOOD, METAL, PLASTICS, OR THE LIKE

Robert P. Miller, New Sewickley Township, Beaver County, Pa.

Application September 17, 1956, Serial No. 610,128

5 Claims. (Cl. 51—180)

In the past there have been machines for the resurfacing of slates such as those commonly used as "blackboards" for school and other purposes. Such blackboards after continual use become badly pitted and irregular, often making them unfit for any further satisfactory use. Often the prior machines have been satisfactory, but more often their use has ground the slate in such fashion that the board must be destroyed and replaced. Such unsatisfactory grinding is often the result of the application of irregular pressure to the grinding tool, resulting in the development of an undulating or wavy surface that is not satisfactory for use.

An object of my invention is to provide a grinding head or disc which will be maintained constantly in one fixed position.

A further object is to provide a grinding disc to which a proper and regular grinding pressure is constantly applied while the disc is in operation.

An additional object is to provide a grinding disc which is drawn into grinding contact by vacuum suction which at the same time removes any elements which have been ground away from the slate being resurfaced.

An even further object is to provide a grinding disc which may be adjusted to varying heights on the slate to be ground.

Further objects will become apparent from an understanding of the drawings forming a part of the application, and the detailed description of the machine.

In the drawings:

Figure 1 is a view in back elevation;

Figure 2 is a view in side elevation showing the grinding disc in operating position, but not showing its supporting truck or dolly;

Figure 3 is an enlarged view in vertical cross section through the grinding head, and partly broken away; and

Figure 4 is a view in front elevation showing the grinding head and its supporting arm.

My resurfacing machine is preferably mounted on a suitable wheeled platform or dolly 10 which carries a conventional electric motor and gear box within the casing 12. A shaft extends from the reduction gear within the gear box and carries a sprocket wheel 14 around which is trained a link drive chain 16 which is likewise trained around a sprocket (not shown) keyed to the axle which carries the drive wheel 18 of the wheeled platform or dolly. It will be understood that the electric motor may be suitably controlled by conventional means (not shown) so that the platform and the mechanism which it carries, may be moved at any desired speed. The motion of the platform will obviously be along the length of the slate or blackboard that is to be resurfaced.

The grinding element, which will be described more fully hereinafter, is pivotally supported above the platform by stanchions 20. The stanchions 20 also support a vertically positioned tube 22 which extends upwardly to a stub shaft 24 pivotally supported at the uppermost portion of the stanchion. The shaft 24 carries on its end

remote from the tube 22 a dual V-belt pulley 26. The larger of the dual pulley carries a V-belt 28 which travels around a pulley mounted on the shaft of a conventional electric motor 30, which also is carried by the wheeled platform 10. The end of the stub shaft 24 remote from the dual pulley 26 extends within a hollow tube or shaft 32 which is rotatably supported by the stub shaft 24 and the tube 22. A disc 34 encircles the stub shaft 24 and the hollow shaft 32, and is irrotationally secured to the stanchion 20.

An arm 36 is pivotally supported by the stub shaft 24 and extends outwardly to support a grinding element, generally identified as the element 38. The grinding element 38 is preferably composed of a steel pan 40 having a peripheral lip 41, a sponge rubber disc 42, a relatively hard rubber disc 44 and a sandpaper disc 46. These discs are suitably secured, by the use of a conventional keyhole attaching means 47 to a disc 48 mounted on the hollow shaft 50.

The hollow shaft 50 extends through, and is secured to the end of the arm 36 remote from its pivotal connection on the stub shaft 24. The hollow shaft 50 is directly connected with a tube 52 which extends along the arm 36 and is connected to the hollow tube or shaft 32, through which a tube 54 extends to a suitable vacuum device 56. The grinding element 38 is rotated by the rotation of the V-belt pulley 58, which in turn is rotated by the belt 60 passing over the smaller of the dual pulley 62.

The grinding element 38 is first positioned on the slate or blackboard to be reconditioned by the operator placing the grinding element 38 in proper position to grind the portion of the slate that is first to be ground. This is done by his holding the handle 62 while positioning the grinding head 38, and at the same time pushing the holding clamp 64 inwardly (to the right as viewed in Figure 2) against the pressure of the spring 66, and thus releasing the friction stop 68 from its contact on the disc 34. At the time that the grinding head has been placed in the proper position to grind the slate that is to be reconditioned, pressure on the holding clamp 64 will be released and the grinding head 38 will be maintained in its adjusted position.

The disc 48 is preferably secured to a hollow casing 70, from which a plurality of tubes 72 extend, and is affixed to the hollow casing 74 aligned concentrically with the V-belt pulley 58. Thus, suction from the vacuum device 56 will draw air through the hollow shaft 50 directly from the sanding or grinding element 38 as it grinds from the slate or blackboard being resurfaced. Universal joints 78 are provided between the hollow casings 70 and 74 to drive the grinding element 38, and to provide flexibility so that the element can properly follow a sometimes curved surface of the slate being resurfaced.

It will readily be understood that an idler pulley 80 will be positioned to tension the belt 60 by the adjustment of the arm 82 pivoted to the arm 36.

The suction of the vacuum 56 will draw air around the grinding head 38 from the periphery thereof, and will draw the same toward the slate or blackboard to be resurfaced. The suction being constant will maintain the grinding head against the slate with unvarying pressure. The same suction will not only draw and maintain the grinding head against the slate, but will also remove any particles that are ground from the board. Also the suction will maintain a relatively cool sanding surface, thus preventing any melting or burning of the sanding paper.

After the grinding head has been positioned as described above, the platform 10 will be moved lengthwise of the blackboard by the operation of the electric motor

within the casing 12. The speed of movement may be controlled by adjusting the speed of the motor. When one grinding operation has been completed across the board, the grinding head 38 may be changed to another position by raising or lowering the arm 36, as is clearly indicated in dotted lines in Figure 1.

It will be understood that minor changes in the construction of the machine may be made from time to time without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. An abrasive resurfacing machine including a movable carriage, a stanchion upstanding on said carriage, a grinding head supporting arm pivotally secured to said stanchion, a hollow stub shaft rotatably supported near the end of said supporting arm remote from said stanchion, a pulley secured to said hollow stub shaft, belt means driving said pulley, a grinding head mounted concentrically with said pulley on the side thereof remote from said supporting arm, vacuum means connected to said hollow stub shaft at its end remote from said grinding head, and spring pressed frictional means attached to said supporting arm and adapted to maintain the same at any adjusted angle relative to the said carriage.

2. An abrasive resurfacing machine including a movable carriage, a stanchion upstanding on said carriage, a grinding head supporting arm pivotally secured to said stanchion, a hollow stub shaft rotatably supported near the end of said supporting arm remote from said stanchion, a pulley secured on said hollow stub shaft, means driving said pulley, a grinding head mounted concentrically with said pulley on the side thereof remote from said supporting arm, vacuum means connected to said hollow stub shaft at its end remote from said grinding head, and spring pressed frictional means attached to said supporting arm and adapted to maintain the same at any adjusted angle relative to said carriage, the said vacuum constantly drawing the grinding head against the surface being ground and resurfaced.

3. An abrasive resurfacing machine including a movable carriage, a stanchion upstanding on said carriage, a grinding head supporting arm pivotally secured to said stanchion, a hollow stub shaft rotatably supported near the end of said supporting arm remote from said stanchion, a pulley secured to said hollow stub shaft, means driving said pulley, a grinding head mounted concentrically with said pulley on the side thereof remote from said supporting arm, vacuum means connected to said hollow stub shaft at its end remote from said grinding head, and spring pressed frictional means attached to said supporting arm and adapted to maintain the same at any selected angle relative to said carriage, said vacuum constantly drawing said grinding head against the surface to be resurfaced with equal pressure and constant cooling and particle removal.

4. An abrasive resurfacing machine including a movable carriage, a stanchion upstanding on said carriage, a grinding head supporting arm pivotally secured to said stanchion, spring pressed frictional means attached to said supporting arm adapted to maintain said arm in adjusted position relative to said carriage, a hollow stub shaft rotatably supported near the end of said supporting arm remote from said stanchion, a pulley secured to said hollow stub shaft, means driving said pulley, a grinding head mounted concentrically with said pulley on the side thereof remote from said supporting arm, said grinding head and pulley being connected together and providing a direct air circulation passage between the radial centers thereof, and vacuum means connected to said stub shaft at its end attached to the said supporting arm, said vacuum communicating directly with the face of the grinding head remote from said pulley.

5. An abrasive resurfacing machine including a movable carriage, a vertically extending stanchion on said carriage, a supporting arm pivotally secured to said stanchion near its point of attachment to said carriage, a hollow stub shaft rotatably secured to said arm at its end remote from said carriage, a pulley secured to said hollow stub shaft, means driving said pulley, a grinding head having an open radial center axially aligned with said pulley, an air passageway between the open radial center of the grinding head and the hollow stub shaft, and vacuum means communicating with the stub shaft at its end connected to the said supporting arm.

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