

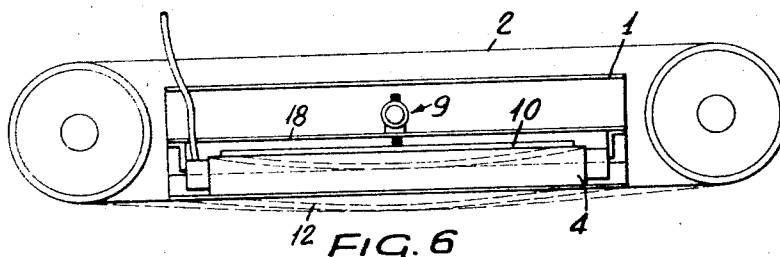
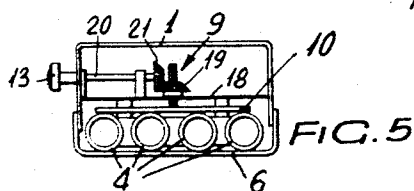
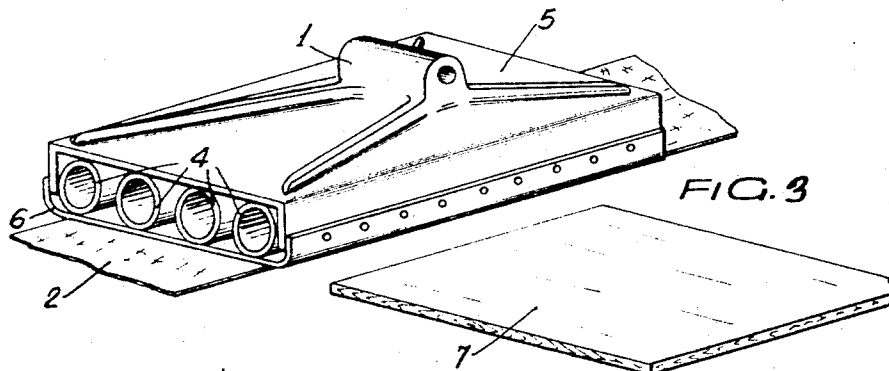
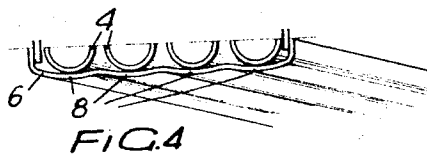
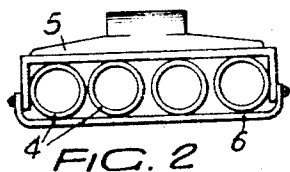
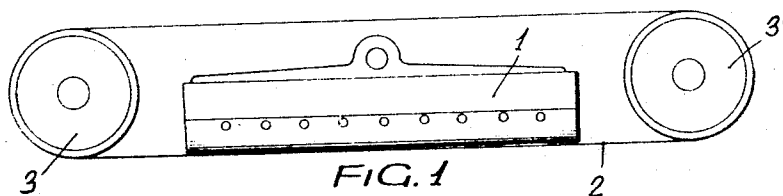
April 15, 1969

E. VICH
INTERCHANGEABLE ELASTIC PAD FOR ABRADING, GRINDING
AND SANDING MACHINE

3,438,154

Filed May 25, 1966

Sheet 1 of 2



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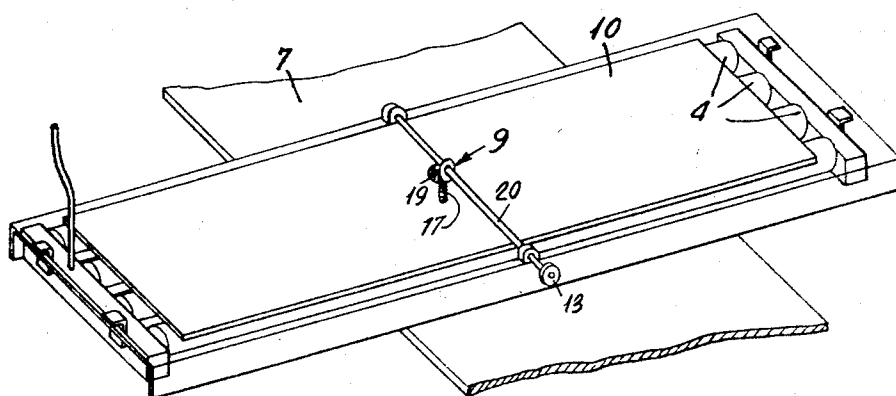


FIG. 7

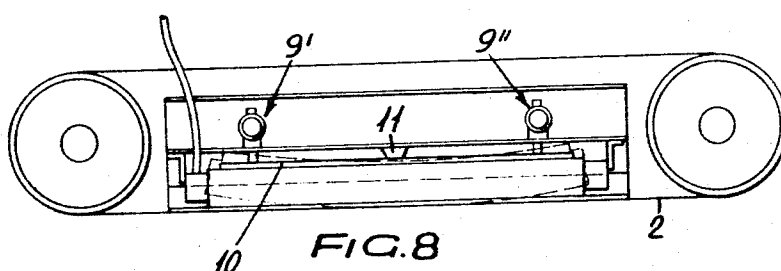


FIG. 8

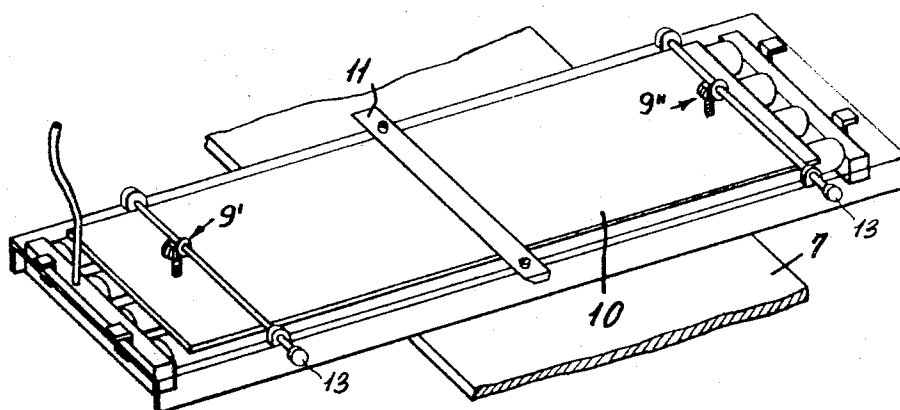


FIG. 9

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2 Claims

ABSTRACT OF THE DISCLOSURE

An abrasive belt pressurizing backing pad consisting of flexible tubes engaged on the side thereof opposite the belt by an elastic plate adapted to be bent or curved in the central area thereof to thereby provide a greater pressure at the central area of the abrasive belt than at the edges.

Up to the present time the grinding, abrading or leveling machines are provided with an abrasive belt which rapidly moves in a straight line while being supported by a pad having a rigid plan surface, the elastic suspension of said pad being obtained by means of spring supports, pneumatic or hydraulic systems.

The abrasive contact surface between the belt and the object to be ground or leveled is plane and prevents the dust forming during the grinding operation from escaping outwards. It follows that the abrasive belt gets easily clogged up with dust.

As a consequence thereof the clogged belt cannot accomplish its abrasive function satisfactorily because the contact with the surface to be ground is unequal. The treated surfaces result to be irregular and streaky.

The present invention relates to an interchangeable pad suited to be applied to grinding or leveling machines with an abrasive belt for grinding or leveling surfaces of wood, iron, plastic or any other material as well as painted or non-painted plan or wavy surfaces, whereby the clogging due to the working residues has to be absolutely avoided, said pad being characterized by means suited to press the abrasive belt against the surface to be treated but only in predetermined regions thereof and preferably with more pressure at the center of the surface than at the edges, thereby providing the work to be removed from the interspaces comprised between said regions.

According to a preferred embodiment of the invention the slide gliding face of the pad on the non-abrasive face of the belt is realized by an elastic cloth fixed on the sides of the housing and having rolls or tubes resting thereon. It is obvious that by pressing the pad on the belt which is fast moving on the surface to be treated, the tubes or rolls will partially give way thereby causing the belt to adhere to the surface in various contact regions, the number of which depends on the number of the tubes or rolls making up the pad. It is also obvious that by this manner every imperfection of the surfaces to be leveled will be eliminated by the abrasive belt.

Furthermore, and this is the major feature of the invention, the work dust residues, produced by the abrasive belt, will actually escape through the spaces between the various contact points of the pad due to the provision of the elastic tubes or rolls since the cutting effected by the abrasive belt is not performed in a plane but on a semicurved face.

To make the invention better understood some embodiments of the pad will be described hereinafter by referring to the accompanying drawings, in which:

FIG. 1 is a longitudinal view on a pad according to the present invention as applied to a grinding or levelling machine.

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FIG. 2 is a cross section thereof.

FIG. 3 is a perspective view of said pad during its operative phase.

FIG. 4 is a view of the particular form which the elastic cloth underneath the rolls assumes during the working process.

FIG. 5 is a cross section through a second embodiment of the pad of the invention which is provided with a device suited to apply a larger pressure at the center.

FIG. 6 is the corresponding side view.

FIG. 7 is the corresponding perspective view.

FIG. 8 is a view of a further modification of the embodiment of FIG. 6.

FIG. 9 is the perspective view of the pad shown in FIG. 8. The pad 1 shown in the FIGS. 1-4 is illustrated as resting on the abrasive belt 2 which is mounted on the rolls 3, 3'. FIG. 2 shows a side view of pad 1, wherein the elastic tubes 4 are mounted within the housing 5 and have the cloth 6 fixed laterally to housing 5 and tangentially adhering to the lower surface of said tubes. In FIG. 3, pad 1 is shown as resting on the non-abrasive face of belt 2 while the object 7 is ready to be ground or leveled by the device of the invention. FIG. 4 illustrates the position which the elastic cloth 6 will assume when pad 1 is pressed on abrasive belt 2 during the operation and clearly shows the contact points 8 provided by the elastic tubes or rolls 4.

The pad of the invention fits to work not only plan surfaces but also wavy ones since pad 1 provided with elastic tubes assumes the function of a so-called sensing pad i.e., it conforms to accomplish an operation similar to the one obtainable by hand. Depending on the kind of work to be executed a grinding machine may have inserted therein, any suitable pad provided with the most convenient number of elastic tubes.

Practical experimental tests have shown that the modifications illustrated in the FIGS. 5-9 may considerably increase the efficiency of the pad of the invention as well as improve the work done thereby.

The pad illustrated with reference to FIGS. 1-4 has the disadvantage of wearing off the lateral edges of the objects or panels to be treated, especially in cases in which the surface of the structure of said panels is irregularly finished or formed.

For grinding or smoothing of such irregular surfaces it is required to remove a large amount of material from the entire surface and for this reason the pressure exerted by the panels on the elastic rolls must be very large.

At the side edges of the panels, where the pressure zone ends, the elastic rolls obviously bend, thereby lowering the abrasive belt below the working plane. It follows that too much material is going to be removed from the edges of the panels causing a substantial undesirable wear of said panels.

In the modifications shown in the FIGS. 5-9 the elastic rolls will get a curvature in their longitudinal direction and have their maximum camber at the central part oriented towards the panels to be worked.

Said curvature will absolutely prevent the lateral edges of the panels from getting worn off.

The pad 1 in FIG. 5 is provided with an adjusting device 9 which acts upon an elastic plate 10 so as to have the elastic tubes 4 exert most suitable pressure on the panels, that is the largest pressure at the center and the smallest pressure at the edges.

By increasing the pressure of the elastic rolls 4 against the center of the panel 7 it is possible to expand the working zone with a pressure which decreases from the center towards the sides.

The amount of the curvature of the elastic rolls and the pressure thereof against the panel will be selected according to the amount of material which has to be

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removed from the surface of the panel in order to correct the irregularities or deformations thereof in the best possible way without wearing off the side edges.

The device 9 is made of a pair of bevel gears 19-21 providing for the bending or deflecting of the plate 10 placed below and hence the bending of the elastic rolls 4 constituting the pad of the invention. The drive is imparted by the handle 13 and the shaft 20.

In FIG. 6 the dash line indicates the curvature assumed by the plate 10 in order to exert a larger pressure at the center than at the sides, said pressure being transmitted to the rotating abrasive belt 2, while 18 indicates the frame.

In the modification of FIG. 8 an adjustable cross brace 11 is placed at the center of the flexible plate 10 to constrain the center of curvature of said plate while the ends of same have devices 9'-9'' applied thereto to provide for a larger or smaller bending of the plate.

In other words, the plate is fixed at the center while the edges of same may be lifted by means of said devices 9' and 9''.

At any rate, the system for bending the plate 10 may be of any suitable type and the two above mentioned solutions may be combined, if so desired.

The flexible tubes or rolls may have closed ends and may be filled with a pressure fluid and so work as a kind of pneumatic tubes, without therefore departing from the spirit of the present invention.

What is claimed is:

1. An interchangeable pad to be applied to grinding and levelling machines with an abrasive belt for levelling

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and smoothing surfaces of wood, iron, plastic and the like material, as well as painted and unpainted plane and wavy surfaces, said surfaces having a center zone and having edges, said belt having one non-abrasive face, said pad eliminating any danger that the work residues clog said abrasive belt, comprising means for pressing said abrasive belt against said surface to be worked at predetermined zones and preferably with a pressure larger at said surface center than at said edges, whereby said work residues may escape from the interstices between said pressure zones, said means comprising a series of elastic rolls of substantially round cross section; an elastic cloth pressed at said abrasive belt, and at least one elastic plate pressing on top of said elastic rolls, said plates being adapted to be bent or curved in the central area thereof.

2. The pad as claimed in claim 1, said elastic rolls being mounted in the pad housing tangentially arranged to said elastic cloth, said non-abrasive face of said belt adhering thereto.

References Cited

UNITED STATES PATENTS

2,618,913	11/1952	Plancon	51-141 X
2,762,173	9/1956	Böttcher	51-141
3,167,889	2/1965	Jacobi	51-141
3,221,448	12/1965	Heesemann	51-141
3,283,447	11/1966	Cretsinger	51-141

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