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(54) Polishing head particularly for granite, marble, and the like slab materials.

(57) The invention relates to a polishing head particularly for polishing slabs of granite, marble, and the like, which comprises a body (1) connected to a bracket (2) supported for translation on a stationary frame (4), said body (1) having at the bottom a disk (20) arranged to rotate axially relatively to said body (1) and carrying a plurality of abrasive pads (30) set oscillating about substantially perpendicular axes to the axis of said disk (20). A peculiar aspect of the invention is that said body (1) is mounted on said bracket (2) with provision for oscillating about a substantially perpendicular axis to the axis of said body (1). Also provided is an elastic balancing means (10) acting between said body (1) and said stationary frame (4), as well as a dampening means (12) acting between said body (1) and said bracket (2).

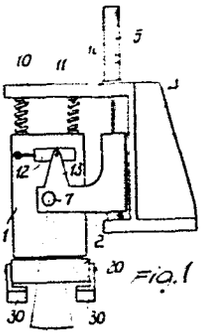

Fig. 1

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POLISHING HEAD PARTICULARLY FOR GRANITE, MARBLE, AND THE LIKE SLAB MATERIALS"

This invention relates to a polishing head particularly for granite, marble, and the like slab materials.

Commercially available are at present marble and granite polishing heads which comprise a body carried rigidly on a bracket arranged to be slidable vertically with respect to the stationary frame, which body has at the bottom a rotary disk supporting a number of abrasive pads set for oscillation about substantially perpendicular axes to the rotation axis of said disk.

For transmitting the oscillatory movement to the pads, a cam driven by a set of gears deriving their motion from the same shaft that drives the disk rotatively is provided.

This approach is particularly rigid from the mechanical standpoint, and liable to frequent damage and considerable wear. Moreover, an external elastic means is provided to hold the feeler in contact with the cam, which in addition to being of complex construction are liable to undergo intense wear because exposed to a very dusty environment, as that surrounding the abrasion area between the abrasive pads and slab being processed is bound to be.

Further, a problem encountered with conventional heads is that they have rigid supports, so that they do not readily adjust to accommodate any slopes in the surface being processed, while they may originate significant vibration affecting the process quality.

It is an object of this invention to remove such prior drawbacks by providing a polishing head particularly for granite, marble, and the like slab materials, which is structured to elastically accommodate any inclinations on the slab plane and generate no vibrations during the processing operations.

A further object of the invention is to provide a polishing head, wherein the drive transmitting the oscillatory motion to the abrasive pads can accommodate elastically possible stresses without straining or otherwise damaging the drive members.

It is another object of this invention to provide a polishing head which, thanks to its peculiar construction, can give assurance of being highly reliable and safe in operation.

These and other objects, such as will be apparent hereinafter, are achieved by a polishing head particularly for granite, marble, and the like slab materials, according to the invention, comprising a body connected to a bracket supported for translation by a stationary frame, said body having at the bottom a disk rotating axially with respect to said body and carrying a plurality of abrasive pads oscillating about substantially perpendicular axes to the axis of said disk, characterised in that said body is mounted on said bracket for oscillation about a substantially perpendicular axis to the axis of said body, there being further provided an elastic balancing means acting between said body and said stationary frame, and a dampening means acting between said body and

said bracket.

Further features and advantages will be more clearly apparent from the following description of a preferred, though not limitative, embodiment of a polishing head particularly for granite, marble, and the like slab materials, as illustrated by way of example and not of limitation in the accompanying drawing, where:

Figure 1 is a side view of this head;

Figure 2 is a front view of this head;

Figure 3 is an axial section view of this head; and

Figure 4 is an enlarged scale, detail view of the connection between the cam following feeler and elastic engagement means.

Making reference to the cited drawing figures, the polishing head particularly for granite, marble, and the like slab materials, according to the invention, comprises a body 1, which is connected to a bracket 2 supported for sliding movement in a vertical direction, i.e. perpendicularly to the conveyor belt 3 which feeds the slabs into the process, by a stationary frame generally indicated at 4.

The connection between the bracket 2 and frame 4 is accomplished by means of a cylinder 5 the rod of which is connected to the bracket 2.

The body 1 is connected to the bracket 2 by means of a pin 7 which allows the body 1 to oscillate about a perpendicular axis to the axis of the body 1 to readily adapt to different patterns of the surfaces

being processed.

For a correct positioning of the body 1, there is provided an elastic balancing means comprising coil springs 10 arranged to act between the upper portion of the body 1 and a lug 11 on the stationary frame 4 which overlies the body 1.

In order to prevent vibrations or oscillations induced by the presence of the springs, a dampening means 12 is provided to act between a ear 13 of the bracket 2 and the body 1.

At the lower face of the body 1, a rotary disk 20 is carried rotatably which is driven rotatively by a vertical shaft 21 connected to conventional drive motors, schematically indicated at 22.

The rotary disk 20 carries, peripherally arranged at uniform intervals, a plurality of abrasive pads 30, which are mounted for oscillation about perpendicular axes to the cited vertical shaft.

The connection is accomplished through a cam following arm 31 which extends from the hinge point of the abrasive pads and contacts a cylindrical cup cam 35 connected to a cogged pulley 36 carried rotatably on the vertical shaft 21.

The motion for rotating the cogged pulley 36 is derived directly from the shaft 21 through a cogged drive pulley 37 keyed to the shaft 21 and connected to a first return pulley 38 by means of a first cogged belt 39. The first return cogged pulley is keyed to a small auxiliary shaft 40 to which is also keyed a second return pulley 41 which, through a

second cogged drive belt 42, drives the cited cogged pulley 36 rotatively, thereby the oscillation imparted to the abrasive pads is at all times perfectly timed to the rotary movement of the rotary disk 20.

In order to hold the cam following feeler arm 31 of the pads 30 pressed, an elastic engagement means generally indicated at 50 is provided which is substantially enclosed within the rotary disk interior and comprises a hollow cylinder 51 accommodating a spring 52 therein which acts on a small piston 53 defining at the top an engagement seat for a small ball 54 which couples by contact with a small peg 55 rigidly connected to the cited cam following arm.

The coupling of the peg to the ball is provided to avoid wear phenomena owing to the sliding movement which is generated between the peg 55 and piston 53 on account of the oscillation imparted to the cam following arm.

It should be also pointed out that the elastic engagement means of the cam following feeler arm is adequately protected by that it is positioned inside the rotary disk, and hence, is not liable to wear owing to the presence of abrasive dust or other similar factors.

The operation mode of the polishing head described above will be apparent from the foregoing: in fact, in order to polish a slab , it will be sufficient to lower the body 1 by means of the cylinder 5 which moves the bracket 2 downwards, it being possible to adjust the engagement force between

the body 1 and the slab being processed.

During the slab processing, the body 1, being mounted oscillably, can readily adapt itself to any varying patterns of the slab surface, without the body 1 undergoing impact loads or vibrations, thanks to its oscillatory mount under the bias of an elastic balancing means and in association with a dampening means.

It will be appreciated from the foregoing, therefore, that the invention achieves its objects, and in particular that with the above construction, a polishing head has been provided which has greatly improved features over conventional ones.

The invention as conceived is susceptible of many modifications and variations without departing from the scope of the instant inventive concept.

Moreover, all of the details may be replaced with other, technically equivalent, elements.

In practicing the invention, the materials used, as well as the dimensions and contingent shapes, may be any selected ones to meet individual requirements.

CLAIMS

1. A polishing head particularly for granite, marble, and the like slab materials, comprising a body (1) connected to a bracket (2) supported for translation by a stationary frame (4), said body having at the bottom a disk (20) rotating axially with respect to said body (1) and carrying a plurality of abrasive pads (30) oscillating about substantially perpendicular axes to the axis of said disk (20), characterised in that said body (1) is mounted on said bracket (2) for oscillation about a substantially perpendicular axis to the axis of said body (1), there being further provided an elastic balancing means (10) acting between said body (1) and said stationary frame (4), and a dampening means (12) acting between said body (1) and said bracket (2).

2. A polishing head, according to Claim 1, characterised in that said elastic balancing means (10) comprises coil springs acting between the upper surface of said body (1) and a lug (19) on said stationary frame (4) overlying said body (1).

3. A polishing head, according to the preceding claims, characterised in that it comprises a driving cogged pulley (37) keyed to the rotation shaft (21) of said disk (20) and connected through a first cogged belt (39) to a first return cogged pulley (38) keyed to an auxiliary shaft (40) to which is keyed a second cogged pulley (41) adapted to transmit the motion through a second belt to a cogged pulley (36) carrying a cylindrical cup cam (35) interacting with

the cam following arm (31) of said abrasive pads (30) to oscillate said pads (30).

4. A polishing head, according to one or more of the preceding claims, characterised in that it comprises an elastic means (50) of engagement of said cam following arm (31) with said cup-like cam (35), said elastic means of engagement comprising a hollow cylinder (51) on the interior whereof a spring (52) is accommodated acting on a piston (53) engageable in contact relationship with a peg (55) made rigid with said cam following arm (31).

5. A polishing head, according to one or more of the preceding claims, characterised in that said piston (53) is provided at the top with a seat for accommodating a ball (54) therein in rolling contact with the end of said peg (55).

6. A polishing head particularly for granite, marble, and the like slab materials, according to the preceding claims and substantially as herein described and illustrated.

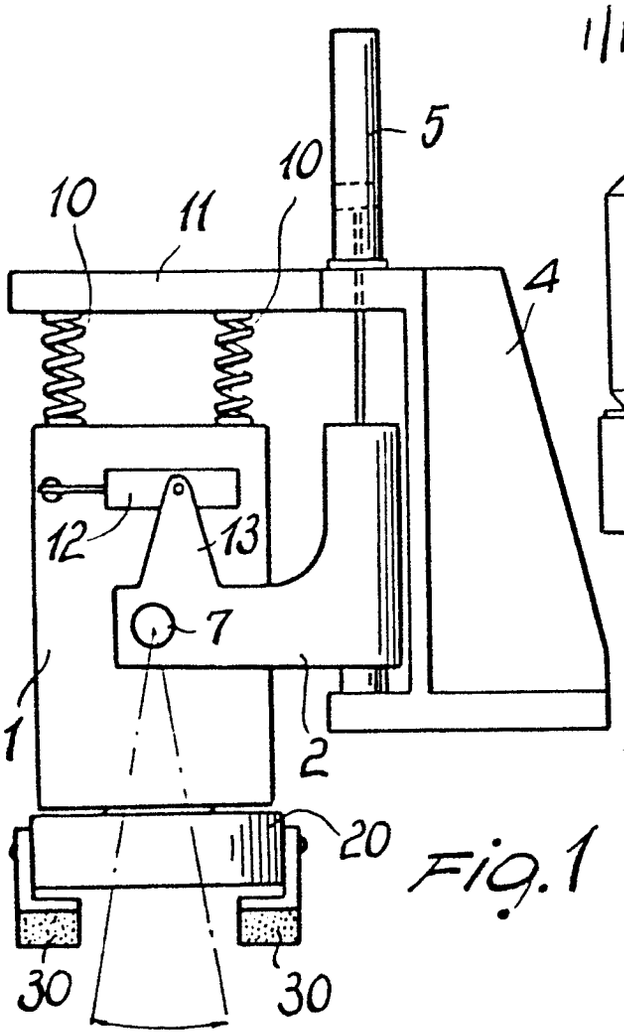

Fig.1

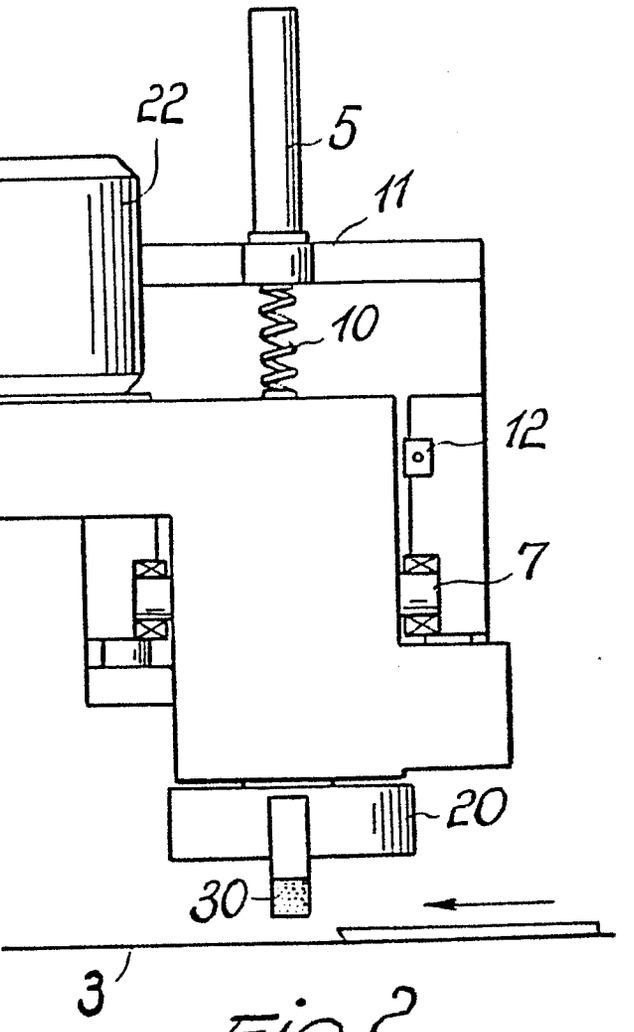

Fig.2

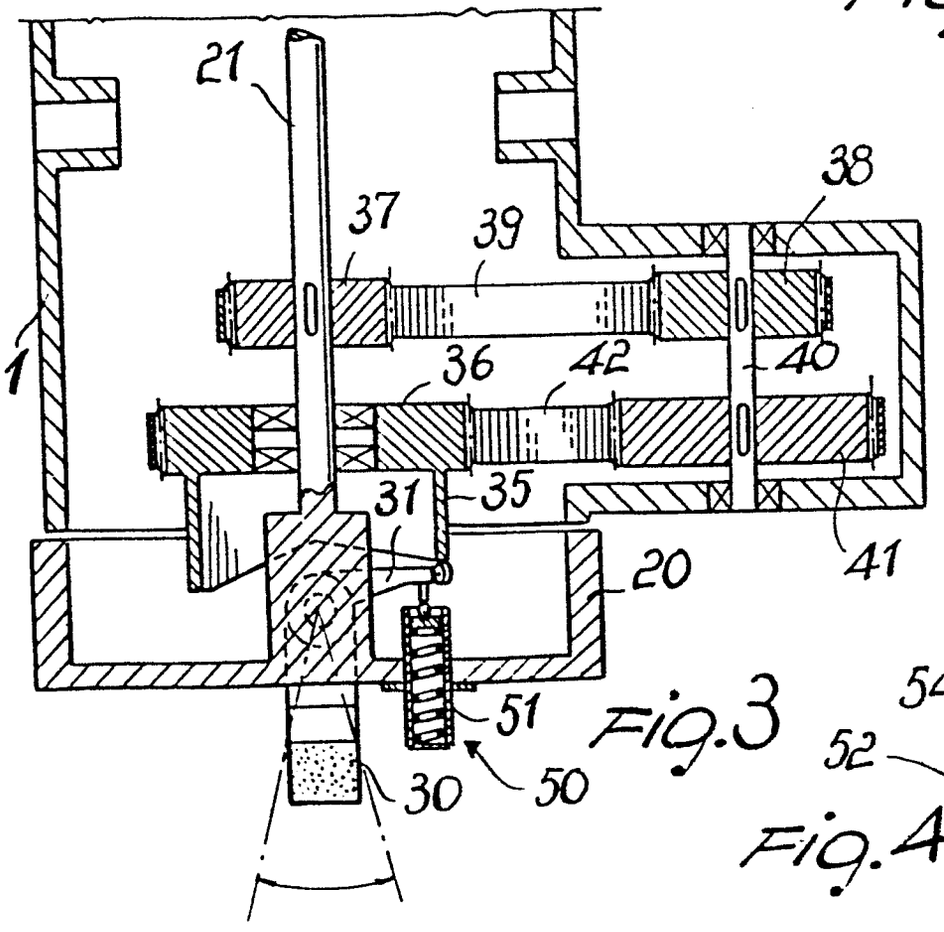

Fig.3

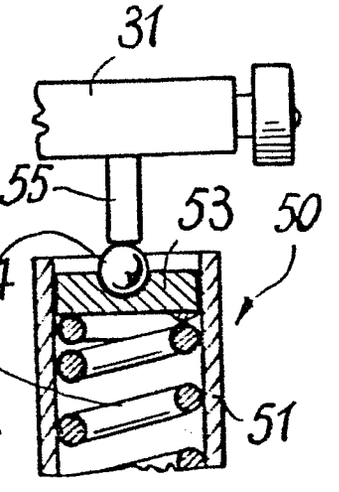

Fig.4