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(54) A mounting insert for an abrasive tool for use in calibrating machines with rotary heads and oscillating arms

(57) The insert comprises a first layer of soft, stroke dampening elastic material and a second layer of harder, noise deadening material. The layers are interposed between an abrasive tool (11) and the oscillating arm (20) of a rotary head of a calibrating machine. The two layers consist of two complementary, adjacent elastic elements (13, 14) of which the lower (13) is securely attached to the abrasive tool (11). The upper layer (14) provides a means (12) for fastening to the oscillating arm (20). The two complementary elements (13, 14) are so shaped as to provide respective facing, fitting surfaces (13a, 14a) arranged to reciprocally lock the two elements (13, 14) in a given plane and allow reciprocal sliding in a direction which is perpendicular to said given plane.

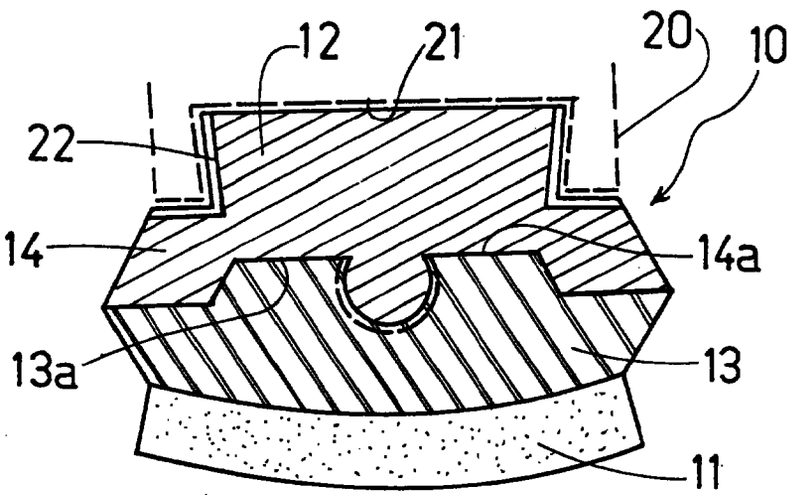

FIG.1

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Description

The present invention falls within the field of machining granite and other similar materials, such as marble, baked clay, stoneware, etc. More particularly, the invention relates to a mounting insert for an abrasive tool for use in calibrating machines of the kind having rotary heads with oscillating mechanical arms.

It is known that stone cutting tools can not directly provide a slab of uniform thickness and having both surfaces smooth. Surface planarity and uniform thickness are attained successively by calibrating the slabs. This also applies to stoneware and baked clay tiles, which tend to deform during baking.

The material or slab to machine is advanced along a mobile plane or conveyor of a calibrating machine having circular calibrating heads that are lowered onto the advancing material. Each head mounts a number of arms oscillating in substantially vertical planes disposed at an angle. Fitted to the free, lower end of each oscillating arm is an insert comprising an abrasive tool for smoothing the surface of the material. The oscillating heads rotate about their own vertical axes while forced to slide reciprocating transversely relative to the direction of advancement of the stone, according to the width of the material and the particular kind of calibrating machine.

The top of the insert is provided with a dovetail shaped head of plastic, aluminium or other material, that is mounted to the oscillating arm. The most recent kinds of abrasive tools, which are at the bottom of the insert, are of diamond type.

Once the tool is worn out, it can in some cases be slipped off its metallic support and replaced by a new one. In other cases the support is split in two members, an upper member and a lower member, where the abrasive element is attached to the lower member. A noise deadening layer of rubber is interposed between the upper and lower members, which are rigidly connected to each other by two or more vertical bolts. When a new abrasive tool is to be mounted, also the lower metallic element integral to the tool is replaced.

The above discusses arrangements have some inconveniences. Firstly, the whole system of oscillating arms and abrasive tools is excessively rigid, which results in a violent stroke occurring between the slab and the oscillating arms every time a slab encounters a rotary head. Due to these stokes, failures tend to occur rather frequently in the arms. Also, the baked clay or stone slab itself is subject to breaking and chipping.

Another problem concerning the rigidity of the system is that the force required to move the abrasive tool across the slab is excessive when a very irregularly shaped slab is processed.

A further problem deriving from the rigidity of the system is that of the excessively high noise in all laboratories where calibrating machines are operating.

It is an object of the present invention to provide an insert capable of overcoming the above prior art drawbacks.

Particularly, it is an object of the present invention to provide an insert allowing to mount the abrasive tool on the calibrating machine elastically, in order to cut down dynamic stresses considerably when the slab is struck and reduce forces transmitted to the head supporting oscillating arms.

Another object of the present invention is to provide a device capable of being easily removed with an aim to facilitate replacing of worn out abrasive tools.

It is a further object of the present invention to provide a device capable of giving the calibrating machine a certain degree of elasticity and at the same time reduce drastically the noise cause by the machine in operation.

In accordance with the invention as claimed, these objects are accomplished by the provision of a mounting insert for an abrasive tool for use in calibrating machines of the kind having rotary heads with oscillating mechanical arms, characterised in that it comprises at least one first layer of soft, stroke dampening elastic material and at least one second layer of noise deadening material, harder than said first layer.

In order that the present invention may be well understood there will now be described two preferred embodiments thereof, given by way of example, reference being made to the accompanying drawings, in which:

FIG. 1 is a transverse sectional view of a first embodiment of the insert of the present invention; and

FIG. 2 is a transverse sectional view of a second, alternative embodiment of the insert of the present invention.

With reference initially to FIG. 1, numeral 10 designates overall a mounting insert of an abrasive member for use in calibrating machines of the kind having oscillating mechanical arms with rotary heads.

Mounting insert 10 serves to elastically secure a preferably diamond, abrasive member or tool 11 to the lower end of an oscillating arm 20 of a rotary head of the aforesaid kind.

Insert 10 forms a dovetail joint head 12 on the side opposite to that of the abrasive tool 11. Dovetail joint head 12 locks in a corresponding dovetail seat 21 obtained in arm 20.

According to the present invention, the abrasive tool 11 is mounted to the oscillating arm 20 by two interposed, complementary elastic members 13, 14 of different rigidity.

Lower elastic member 13 is securely fixed to the abrasive tool 11, whereas upper elastic member 14 forms the dovetail joint head 12 and acts as a fastening member to the oscillating arm.

Preferably, the two complementary members 13, 14 are so shaped as to provide facing fitting surfaces 13a,

14a which provide vertical and transversal fixing of the two parts, while allowing to longitudinally slip the lower part 13 off relative to the upper part 14 (perpendicular to the plane of the illustrated cross-section).

In the embodiment shown in FIG. 1, the lower member 13 is of soft rubber to dampen the strokes, while the upper member 14 is of a harder, noise deadening material, such as rubber or plastic. A number of non-metallic materials may be used to form the upper member 14, provided their hardness is substantially higher than that of the stroke dampening material.

Referring to the variant embodiment of FIG. 2, the shape of mounting insert 10 is identical to that described with reference to FIG. 1, except for that the position of elastic members 13 and 14 is reversed. The lower element 13 is made of hard, noise deadening rubber, while the upper element 14 is made of softer, stroke dampening rubber. A peripheral stiffening rib member 22 of conventional kind having an L-shaped cross section is inserted on the head 12.

In either embodiment, once the abrasive tool 11 is worn, the unit composed of said tool and elastic element 13 attached thereto may be slipped off longitudinally and replaced by a new unit.

As will be apparent, the insert 10 accomplishes both functions of stress dampening and noise deadening, and gives the machine the required degree of elasticity which allows to eliminate the prior art drawbacks discussed in the introductory part of the description. Also, conventional vertical connecting bolts used to sandwich the noise deadening layer and that used to provide a rigid means limiting the positive effects of said material are eliminated.

While two specific embodiments of the insert according to the invention have been disclosed, it is to be understood that such disclosure has been merely for the purpose of illustration and that the insert is not to be limited in any manner thereby. Various modifications will be apparent to those skilled in the art in view of the foregoing example. The scope of the invention is to be limited only by the appended claims.

Claims

1. A mounting insert (10) for an abrasive tool (11) for use in calibrating machines of the kind having rotary heads with oscillating mechanical arms (20), characterised in that it comprises at least one first layer of soft, stroke dampening elastic material and at least one second layer of noise deadening material, harder than said first layer.

2. A mounting insert according to claim 1, characterised in that said layers consist of two complementary, adjacent elastic elements (13, 14) of which the lower (13) is securely attached to the abrasive tool (11), the upper (14) providing a means (12) for fastening to the oscillating arm (20).

3. A mounting insert according to claim 2, characterised in that the two complementary elements (13, 14) are so shaped as to provide respective facing, fitting surfaces (13a, 14a) arranged to reciprocally lock said two elements (13, 14) in at least two non parallel directions.

4. A mounting insert according to claim 3, characterised in that said fitting surfaces (13a, 14a) are so shaped as to reciprocally lock the two elements (13, 14) in a given plane and allow reciprocal sliding in a direction which is perpendicular to said given plane.

5. A mounting insert according to claims 1 to 4, characterised in that the lower elastic element (13) is more rigid than the upper elastic element (14).

6. A mounting insert according to claims 1 to 4, characterised in that the lower elastic element (13) is less rigid than the upper elastic element (14).

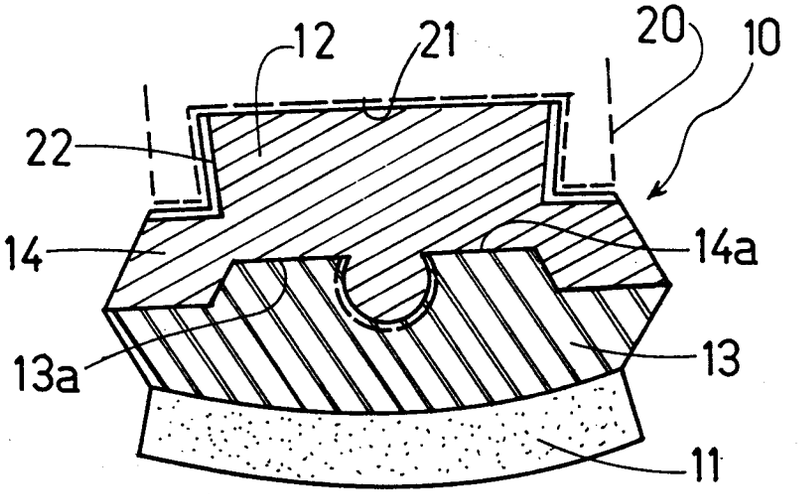

FIG.1

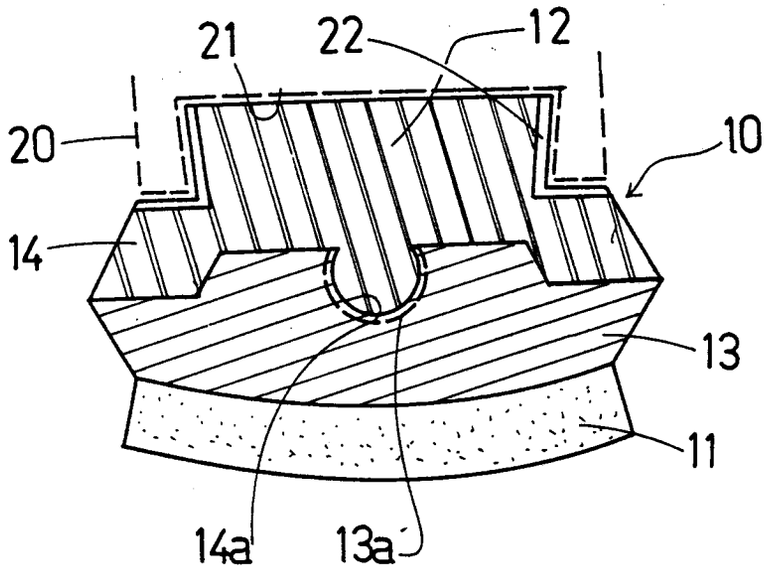

FIG.2