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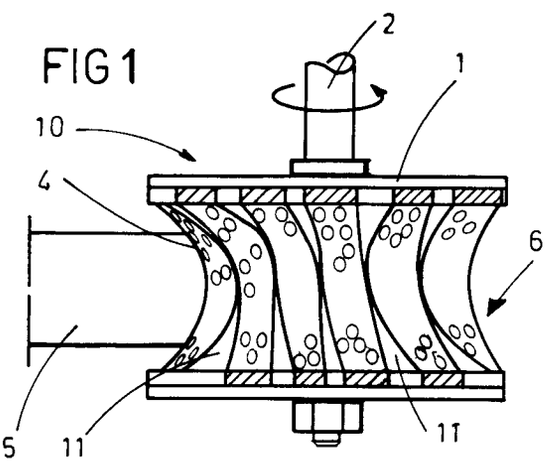
(54) A banded grinder for working edges of slabs of marble, granite and the like

(57) A banded grinder for working edges of slabs of marble, granite and the like, comprising a main body (1) keyable on a rotary chuck (2) and having a lateral surface (3) which is shaped complementarily to an edge (4) of a slab (5). The grinder (10) comprises a length of abrasive tape (6), arranged to superpose the lateral surface (3) of the main body (1), ring-wound about said main body (1) and closed at opposite ends (7). The grinder further comprises a layer (11) of elastically deformable material inpter-positioned between and adherent to the lateral surface (3) of the main body (1) and the length of abrasive tape (6) and rendering the main body (1) and the abrasive tape (6) reciprocally solidly constrained. The layer (11) of elastically deformable material covers the opposite ends (7) and the cut lateral edges (9) of the abrasive tape (6), incorporating both in a banded strip (12) having a continuous abrasive surface (16).

FIG 1



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The invention relates to a banded grinder for working edges of slabs of marble, granite and the like, comprising a main body keyable on a rotary chuck, and having a lateral surface which is shaped complementarily to the edge of the slab, and comprising a tract of abrasive tape superposed on the lateral surface of the main body wound about said body and ring-closed at opposite ends. In machines for shaping slab edges, grinders of the above-described type are largely used especially for work involving relatively little removal of material, such as for example operations of smoothing, shining and lapping of the edge surfaces.

In known processes of grinder manufacturing the abrasive tape, for example criss-cross patterned, is cut to a predetermined size before being applied on the grinder, so that the length of tape corresponds exactly to the perimeter length of the main body, to which it will later be attached. In any case, due to the circularity of the grinder body and the depth of the tape, as well as to the cutting tolerance of said tape and the work tolerations of the grinder body, during the cutting operation a certain discontinuity in the cutting surface, in the form of a step, is manifested at the point where the two ends of the tape meet on the circular body.

A plurality of similar steps is further made where the work surface of the grinder must exhibit a curved profile in order to be able to work on rounded edges of the slab. In such cases, to permit a uniform contact of the abrasive tape on the lateral surface of the main body of the grinder, the lateral edges of the abrasive tape are cut, and when the tape is stretched on the surface of the grinder body, said edges distance one from the other circumferentially thereon, creating a series of further step-interruptions arranged along the periphery of the grinder.

Both the step at the ends of the tape, caused either by excessive length or by excessive shortness of the tape, and the lateral edge steps are the cause of considerable drawbacks, manifested especially during working of a corner where two contiguous slab edges meet; the gaps caused by the steps are invaded by the slab edges and the involved portion of tape can be torn.

The above drawbacks, apart from rendering the grinder unusable, with obvious resulting economic disadvantages, imply the high-speed projection of tape particles all around the work area, placing the grinder operator in some danger, unless safety precautions are taken.

The aim of the present invention, as it is characterized in the claims that follow, is to eliminate the above-mentioned drawbacks in the prior art by totally removing the discontinuities in the edges of the abrasive tape due to the positioning of same on the main body of the grinder.

The above result is obtained by the invention by means of a banded grinding wheel for working edges of slabs of marble, granite and the like, which wheel comprises a layer of elastically deformable material interpositioned between and adherent to the lateral surface of the main body of the grinder and to the length of abrasive tape ring-wound on said body, such that said tape and said body are rendered reciprocally solid.

The layer of elastically deformable material covers the opposite ends of the length of abrasive tape, such that the lateral edges thereof are incorporated in a banded strip having a continuous abrasive surface.

The fundamental advantage of the grinder realized according to the invention consists essentially in a greater grinder working life, resulting in considerable economic savings.

Further, the above-described grinders are much safer and more reliable in a work environment with regard to the safety of the operator.

Further characteristics and advantages of the present invention will better emerge from the detailed description that follows, of an embodiment of the invention, illustrated in the form of a non-limiting example in the accompanying drawings, in which:

figure 1 shows a lateral total view of a grinder according to the invention;

figure 2 is a lateral total representation of a grinder according to the invention seen at the junction area of the opposite ends of the abrasive tape;

figure 3 is a partial axial section of the grinder of figure 1;

figure 4 is a perspective view of an abrasive tape used for the grinder of the previous figures;

figure 5 is an exploded perspective view of parts which can be used to make up a grinder according to the invention;

figure 6a, 6b, 6c, 6d, 6e, 6f, 6g, 6h, 6i, 6l and 6m are examples of slab edges obtained using the invention.

With reference to the figures, the invention essentially comprises a banded grinder 10 for working an edge 4 of a slab 5 of marble, granite and the like.

The grinder 10 comprises a main body 1 made in metal and axially keyable on a rotary chuck 2 and having a lateral surface 3 shaped complementarily to the edge 4 of a slab 5.

The grinder 10 comprises a tract of abrasive tape 6 superposed on a lateral surface 3 of the main body 1 and ring-wound thereon, and closed at opposite ends 7 of said abrasive tape 6.

Between said abrasive tape 6 and said lateral surface 3 of the main body 1 (see figure 3), a layer 11 of elastically deformable material, made of rub-

ber or an elastomer having like characteristics, is interpositioned. This layer 11 adhers both to the lateral surface 3 of the main body 1 and to the abrasive tape 6 such that said main body 1 and said abrasive tape 6 are rendered solidly reciprocally constrained.

The layer 11 of elastically deformable material covers the opposite ends 7 of the abrasive tape 6, incorporating them in a banded strip 12 provided with a continuous abrasive surface 16 (see figure 2).

Figure 4 shows how the abrasive tape 6, before the final construction of the grinder 10, is provided with a plurality of cuts 20 made at lateral edges 9 thereof and having the aim of creating an optimal adaptation of the lateral surface 3 of the main body 1 of the grinder 10 when said main body 1, as shown in figures 1, 2 and 3, exhibits curved generatrices shaped complementarily to the edge 4 of the slab 5.

The layer 11 of elastically deformable material, in this case, covers also the cut lateral edges 9 of the strip of abrasive tape 6, incorporating said cut lateral edges 9 into the banded strip 12 and creating a continuous surface thereof.

With reference to figure 5, a grinder 10 according to the invention can be obtained with a procedure utilizing parts as schematically represented in the figure and constituted by the following operative phases:

- positioning of at least one length of abrasive tape 6 on an internal surface 13 of heated half dies 14 and 15, which internal surface 13 is shaped complementarily to the lateral surface 3 of said main body 1;
- spreading of a layer 11 of elastically deformable material in semi-liquid state on the lateral surface 3 of the main body 1, which layer subsequently adheres to said lateral surface 3;
- closure of the two half-dies 14 and 15 about the main body 1, such that the abrasive tape 6 sinks into the layer 11 of elastically deformable material;
- solidification of the layer 11 of elastically deformable material with consequent intimate connection of the abrasive tape (6) and the layer 11 of elastically deformable material.

The above-described process utilizes a layer 11 of vulcanized rubber, and can be substituted with equivalent results and similar equipment using a conventional injection process of the material to be used for the layer 11.

The invention is susceptible to numerous variations and modifications, all entering within the field of the inventive concept, which concept is herein related to specific examples of an embodiment of a grinder 11, as shown in figures 1, 2 and 3. The grinders realizable according to the present invention can, however, exhibit various geometrical shapes and sizes for realizing, for example, convex edges, concave edges and/or mixed-shape edges, some of which are illustrated in figure 6.

Claims

1. A banded grinder for working edges of slabs of marble, granite and the like, comprising a main body (1) keyable on a rotary chuck (2), and having a lateral surface (3) which is shaped complementarily to an edge (4) of a slab (5), and comprising a tract of abrasive tape (6) superposed on the lateral surface (3) of the main body (1) and wound about said main body (1) and ring-closed at opposite ends (7) of said abrasive tape (6), characterized in that it comprises a layer (11) of elastically deformable material interpositioned between and adherent to the lateral surface (3) of the main body (1) and to the abrasive tape (6) such as to render said main body (1) and said abrasive tape (6) reciprocally solidly constrained, said layer (11) of elastically deformable material covering at least said opposite ends (7) of the length of abrasive tape (6) and incorporating said opposite ends (7) in a banded strip (12) exhibiting a continuous abrasive surface (16).

2. A grinder as in claim 1, wherein said length of abrasive tape (6) exhibits cut lateral edges (9), characterized in that said layer (11) of elastically deformable material covers said length of abrasive tape (6) incorporating said cut edges (9) into said banded strip (12).

3. A grinder as in claim 1, characterized in that said layer (11) of elastically deformable material is constituted by rubber.

4. A grinder as in claim 1, characterized in that said layer (11) of elastically deformable material is constituted by an elastomer.

5. A process for realizing the grinder (10) of claim 1, characterized in that it comprises the following phases:

- positioning of at least one length of abrasive tape (6) on an internal surface (13) of heated half dies (14) and (15), which internal surface (13) is shaped complementarily to the lateral surface (3) of said main body (1);
- spreading of a layer (11) of elastically deformable material in semi-liquid state on the lateral surface (3) of the main body (1), which layer subsequently ad-

heres to said lateral surface (3);

- closure of the two half-dies (14) and (15) about the main body 1, such that the abrasive tape (6) sinks into the layer (11) of elastically deformable material;
- solidification of the layer (11) of elastically deformable material with a consequent intimate connection of the abrasive tape (6) and the layer (11) of elastically deformable material.

FIG 1

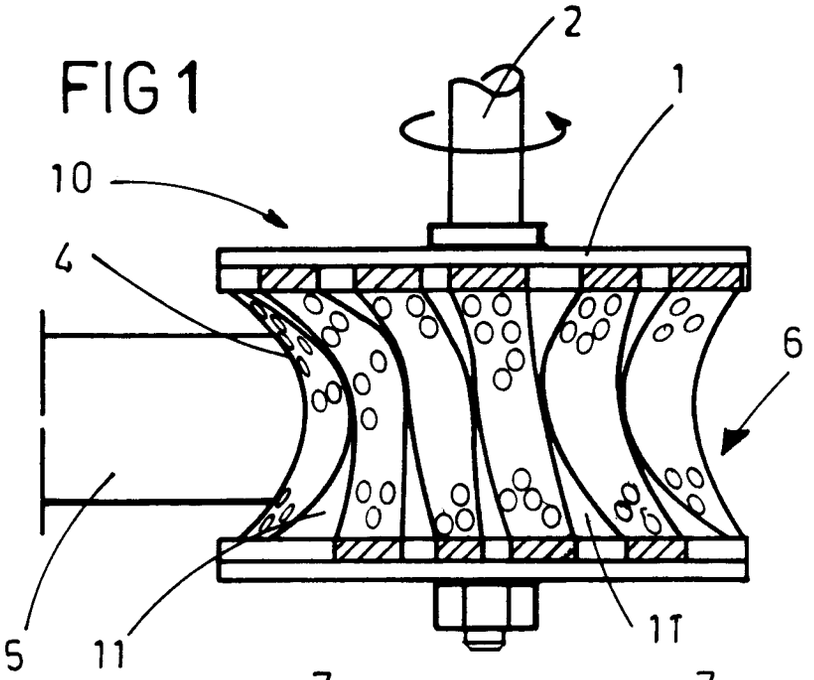
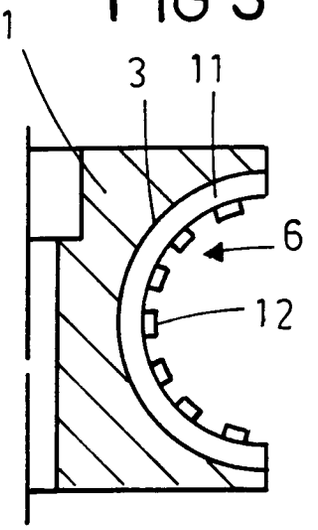


FIG 3



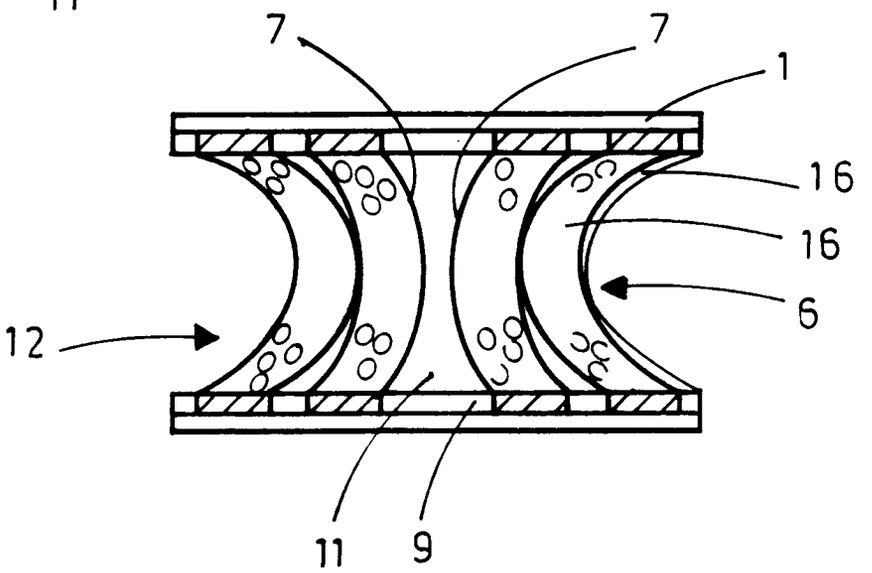


FIG2

FIG 4

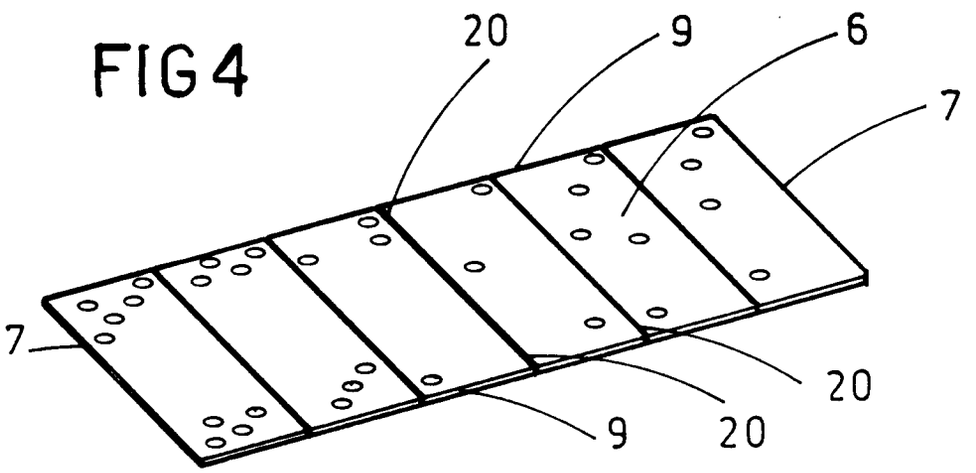


FIG 5

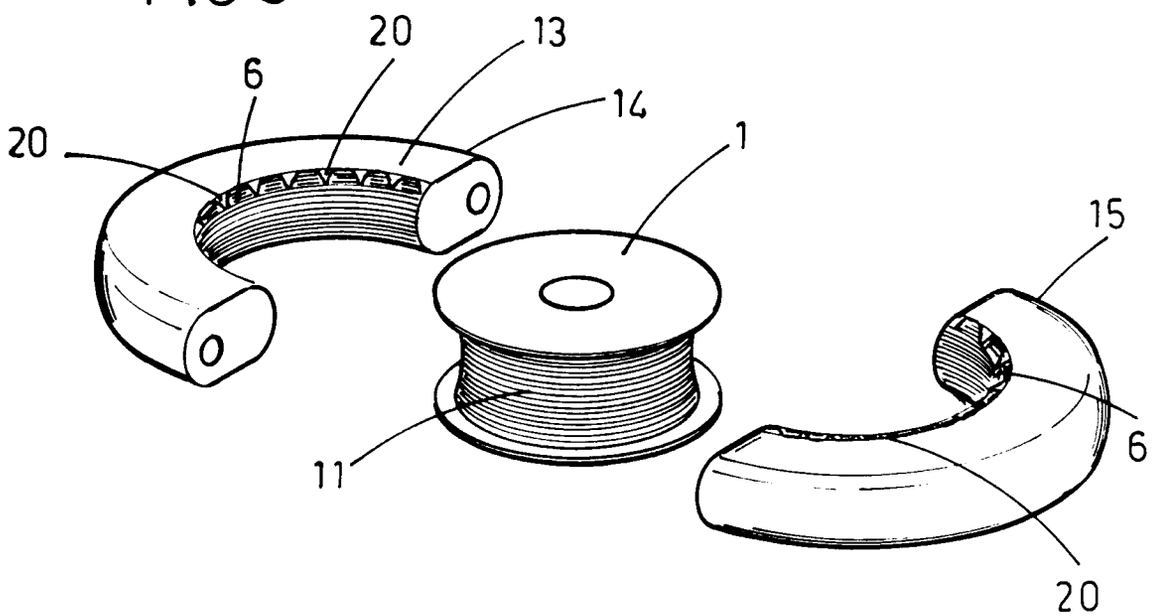
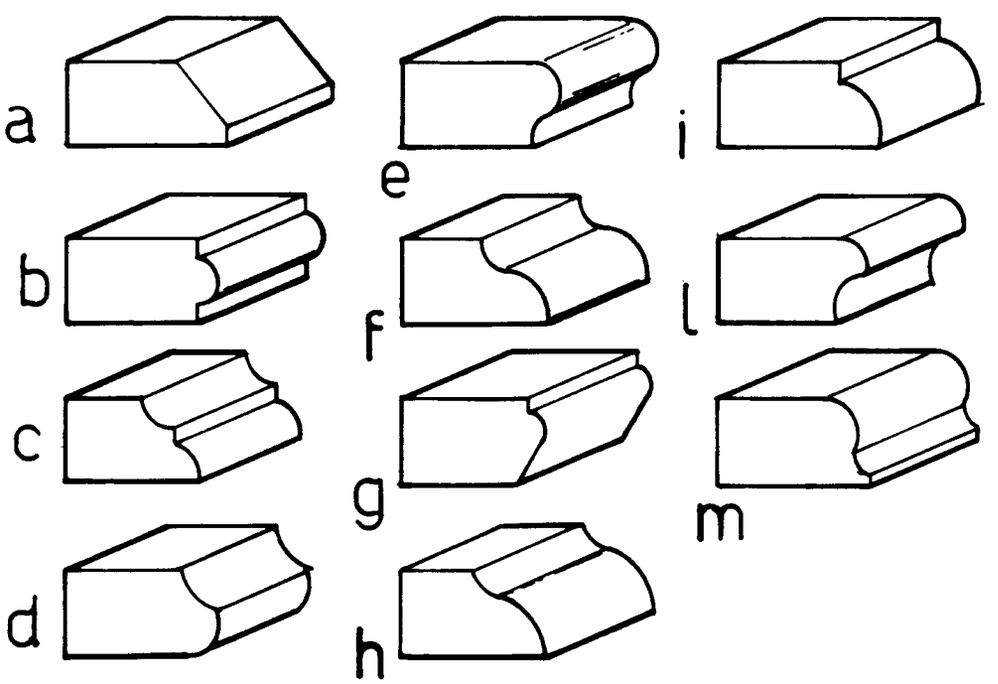


FIG 6



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EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0057

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
E	WO-A-95 08418 (LUPI QUINTILIO) 30 March 1995 * the whole document *	1-5	B24D5/00 B24D13/12 B24B9/06
X	EP-A-0 281 050 (RAVELLI PIERLUIGI) 7 September 1988 * the whole document *	1-4	
A	EP-A-0 122 566 (REICH SPEZIALMASCHINEN GMBH) 24 October 1984 * page 4 - page 5; figures *	5	
A	EP-A-0 242 410 (ELBEL KARL DR ;WACHTER GOTTFRIED (DE)) 28 October 1987 * abstract; figures *	5	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B24D
B24B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 September 1995	Eschbach, D

CATEGORY OF CITED DOCUMENTS

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