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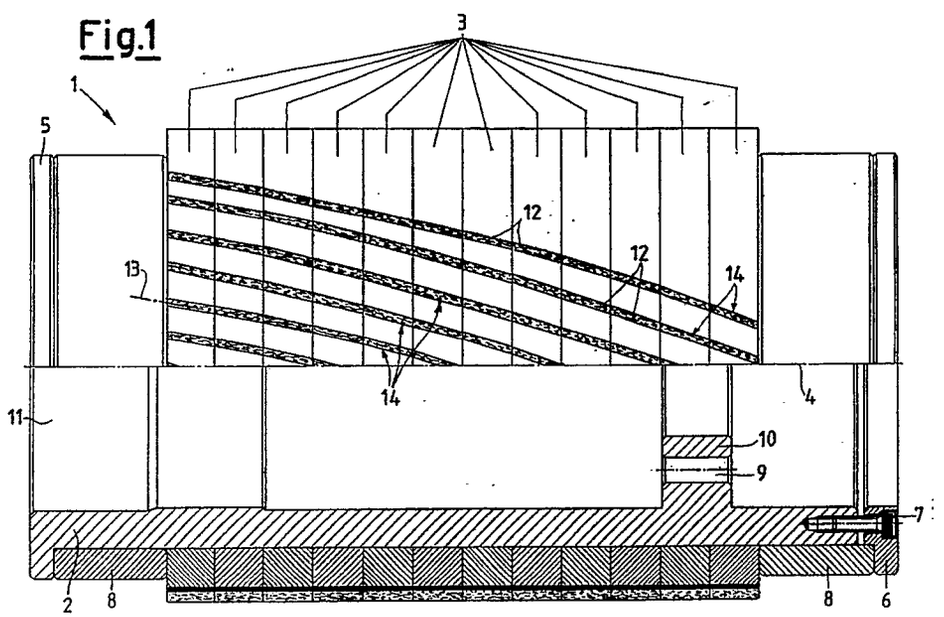
(54) Tool for dressing machines for stone material or the like.

(57) A tool for dressing machines for stone material comprises a drum (2) on which a series of rings (3) carrying equidistant cutters (12) are mounted. Each cutter (12) associated with those of the adjacent rings (3) cooperates to form a cutting face (14) which is skew to the axis of rotation (4) of the tool (1).

Fig.1



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TOOL FOR DRESSING MACHINES FOR STONE MATERIAL OR THE LIKE

This invention relates to a tool for dressing machines for stone material or the like, of the type comprising a drum rotating about its major axis and supporting a plurality of rings such that their major axis is concentric with said major axis of the drum, said rings having a lateral surface on which cutters are fixed at a regular distance apart.

During machining, these types of tool receive their cutting motion by rotating about the major axis of the drum, the workpiece to be machined being driven forward while resting on the machine table. The rings are fixed to the drum at equal distances apart and support the cutters, which are rectangular in plan, with their minor side equal to the thickness of the ring which carries them. The existence of the distance between the rings means that machined surfaces without roughness cannot be obtained. Properly finished surfaces can only be currently obtained by increasing the number of tools operating virtually simultaneously on one and the same workpiece.

In this respect the distance between the rings cannot be reduced to zero because the resultant tool would be unable to expel the chip material removed during machining, with obvious consequences. The object of the invention is to provide a tool for dressing machines for stone material or the like which overcomes the aforesaid drawbacks by eliminating chip expulsion problems while at the same time providing an excellent surface finish to the machined material.

This object is attained by a tool for dressing machines for stone material or the like, comprising a drum with its major axis coinciding with the axis of rotation of the tool, said drum supporting fixed thereto a plurality of rings with their major axis concentric to the major axis of the drum, said rings supporting at a regular distance apart on their lateral surface a plurality of cutters each of which has a major axis, characterised in that the arrangement of the cutters on the ring which carries them is such that their major axis is skew to the major axis of the ring and thus to the major axis of the drum when said ring is mounted coaxially on said drum in direct contact with the adjacent rings.

The skew arrangement of each cutter relative to the major axis of the drum or relative to the axis of rotation of the tool enables each cutter to expel the removed material.

The strict succession arrangement of the rings enables the cutters to form a single cutting face, so improving the surface finish of the machine workpiece,

The invention is illustrated by way of non-limiting example in the figures of the accompanying drawings in which:

Figure 1 is a partly full and partly sectional view of a tool constructed in accordance with the invention;

Figure 2 is a front view of a first alternative embodiment of a tool according to the invention;

Figure 3 is a side view of the tool of Figure 2;

Figures 4 and 5 show a second alternative embodiment of the invention;

Figures 6 and 7 show a third alternative embodiment of the tool. With reference to said figures and in particular to Figure 1, the tool of the invention, indicated overall by 1, comprises a drum 2 supporting fixed thereto a plurality of rings 3 such that their major axis coincides with the major axis of the drum, this being the axis of rotation of the tool 4. The drum 2 comprises a fixed flange 5 at a first end and a removable flange 6 at its other end. The removable flange 6 is fixed by screws 7. The flanges 5 and 6 press together and thus fix the ring 3 with the aid of spacers 8, the width of which in practice determines the number of rings 3. The drum 2 also comprises means for its fixing to the machine spindle, which vary depending on the type of machine spindle and drum size (and thus tool size).

In the case illustrated, the drum 2 is provided with through holes 9 positioned along the circumference of an inner flange 10, and with an annular plate 11 to house a bearing, not shown. The tool thus rotates about the axis 4 idly supported at the annular plate 11, while at the inner flange 10 a flanged shaft (not shown) transmits to it the torque required for exercising the cutting action.

Each ring 3 supports on its lateral surface a plurality of cutters 12 which in the illustrated case are of parallelogram shape in plan view and are constructed of a diamond based sintered material. Each cutter has its major axis 13 skew to the major axis of the relative ring 3, and thus skew both to the major axis 4 of the drum 2 and to the axis of rotation 4 of the tool when said ring 3 is mounted on the drum 2.

When a ring 3 is mounted on the drum 2 together with others, the major axes 13 of its cutters are arranged such that the major axes 13 of the corresponding cutters 12 on its adjacent rings 3 are aligned to form one or more continuous cutting faces 14 with their major axis skew to the major axis 4 of the drum 2.

Figures 2 and 3 show a tool in which the cutting faces 14 extend helically.

Figures 4 and 5 show a tool in which the cutting faces 14 converge towards the centre of the

tool.

Figures 6 and 7 show a tool in which the cutting faces 14 extend in an undulating pattern.

Some of these patterns of the cutting faces 14 are obtained by simply arranging the same rings 3 differently on the drum 2.

The choice of the various cutting face patterns 14 depends on the type of material to be machined and on the cutting parameters (cutting speed, feed speed, cooling conditions etc.). The thickness of each cutter 12 measured perpendicular to its major axis 13 is less than the distance, measured in the same direction, between two adjacent cutters 12 of one and the same ring 3.

The length of a cutter 12 measured along the relative major axis 13 is greater than the distance between two successive cutters of one and the same ring 3.

Indicatively, it is possible to operate correctly on most stone materials with cutters having a width of between 2.5 and 6 mm with their major axis 13 inclined or skew to the axis of rotation 4 by an angle of between 21° and 45°, the angle between two skew axes being that formed when one of the two axes is projected onto the other.

Claims

1. A tool (1) for dressing machines for stone material or the like, comprising a drum (2) with its major axis (4) coinciding with the axis of rotation (4) of the tool (1), said drum supporting fixed thereto a plurality of rings (3) with their major axis (4) concentric to the major axis (4) of the drum (2), said rings (3) supporting at a regular distance apart on their lateral surface a plurality of cutters (12) each of which has a major axis (13), characterised in that the arrangement of the cutters (12) on the ring (3) which carries them is such that their major axis (13) is skew to the major axis (4) of the ring (3) and thus to the major axis (4) of the drum (2) when said ring (3) is mounted coaxially on said drum (2) in direct contact with the adjacent rings (3).

2. A tool as claimed in claim 1, characterised in that the major axes (13) of the cutters (12) of a ring (3) are aligned with the major axes (13) of the corresponding cutters (12) of the adjacent rings (3) so as to form at least one continuous cutting face (14) the major axis of which is skew to the major axis (4) of the drum (2).

3. A tool as claimed in claim 2, characterised in that the cutting faces (14) extend helically.

4. A tool as claimed in claim 3, characterised in that the thickness of a cutter (12) measured perpendicular to its major axis (13) is less than the distance, measured in the same direction, between two adjacent cutters (12) of one and the same ring (3).

5. A tool as claimed in claim 5, characterised in that the length of a cutter (12) measured along the relative major axis (13) is greater than the distance between two successive cutters (12) of one and the same ring (3).

6. A tool as claimed in claim 4, characterised in that the width of the cutters (12) can vary between 2.5 and 6 mm.

7. A tool as claimed in claim 4, characterised in that the major axis (13) of the cutter (12) is inclined to the major axis (4) of the relative ring (3) and likewise the major axis of the cutting face (14) to which said cutter (12) pertains is inclined or skew to the major axis (4) of the drum (2) by an angle of between 21° and 45°.

8. A tool as claimed in claim 7, characterised in that the major axis (13) of each cutter (12) is incident to the major axes (13) of the corresponding cutters (12) of the adjacent rings (3), the cutting faces (14) extending in an undulatory pattern.

9. A tool as claimed in claim 8, characterised in that the major axis (13) of a group of adjacent cutters is incident to the major axis (13) of the remaining group of cutters, the cutting faces (14) extending to converge at the centre of the tool (1).

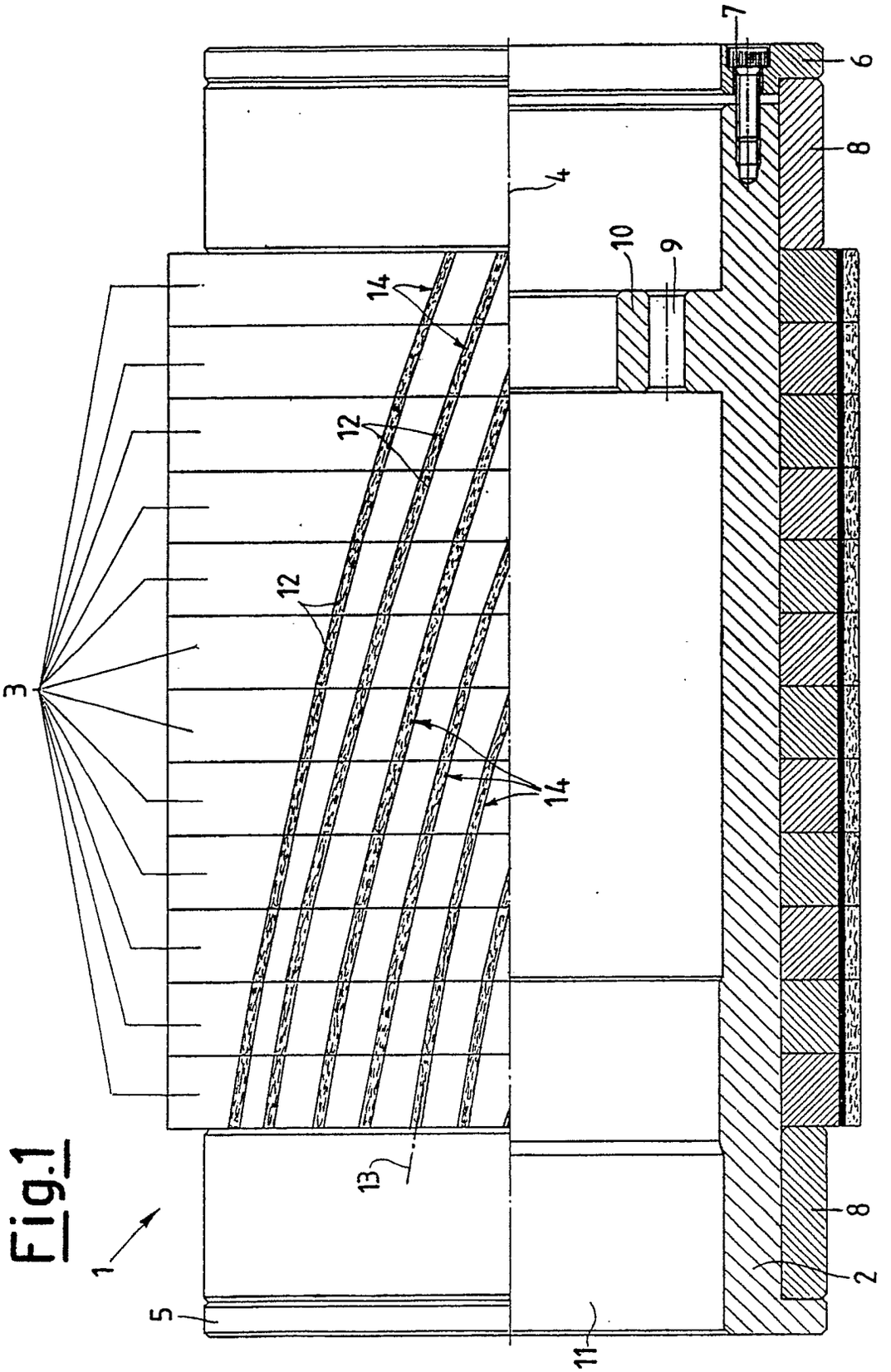

Fig.1

Fig.2

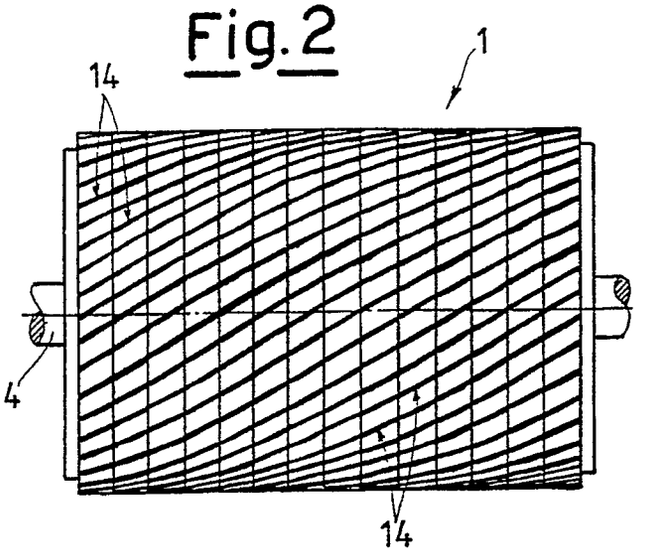

Fig.3

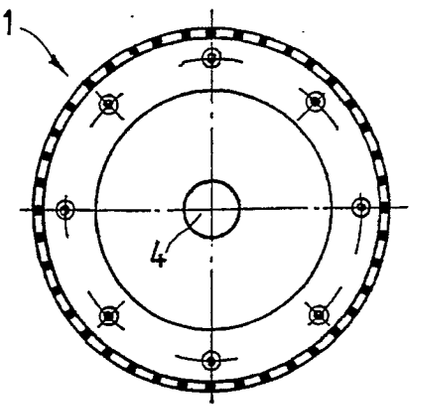

Fig.4

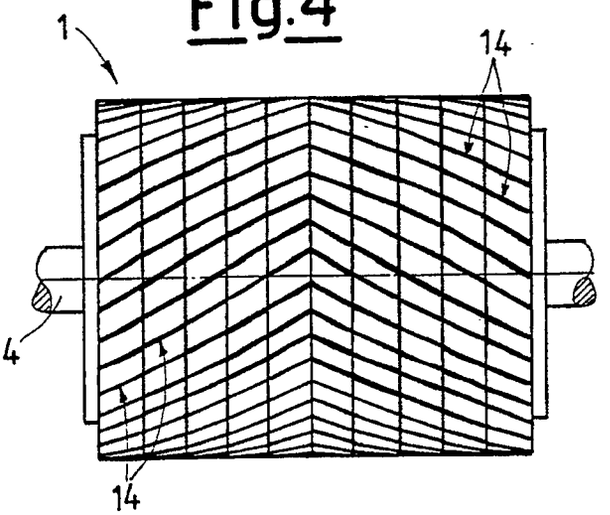

Fig.5

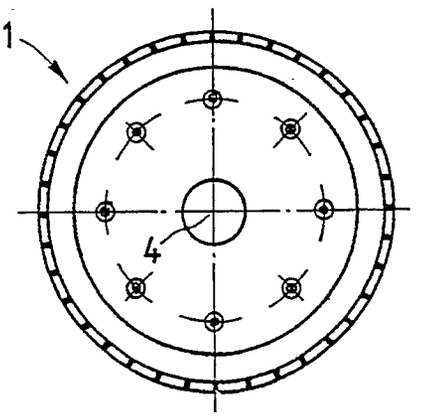

Fig.6

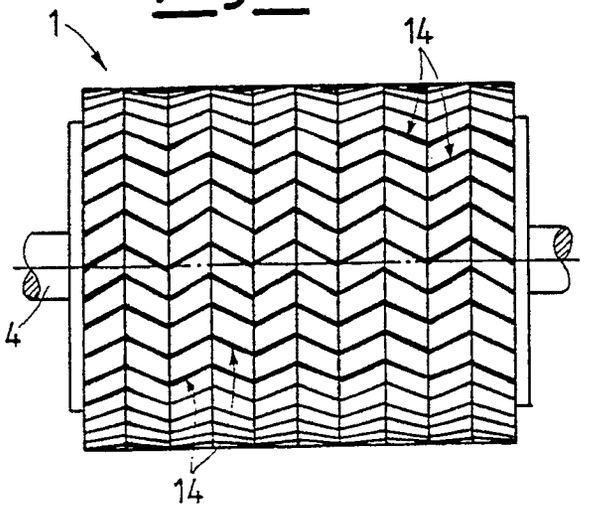

Fig.7