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(54) Apparatus for grinding or milling the surfaces of pieces of stone or similar materials.

(57) Apparatus to grind the surfaces of stone or similar materials; formed by: a discoidal part (2) with perforations (3) set at 60° to each other to attach (2) by screws to a rotating head of a machine, while at 60° and sequentially and set radially there are pairs of notes with an equal distance between each pair but each pair at a different distance from the centre, to which are attached "U" shaped parts (5) placed on the parallel branches of the notes on which is mounted the axle of a roller (6) with elements that aid in the centering and rolling on the same, appearing on the central branch of each "U" shaped part (5) and on the inside face, a straight undercut of approximate width that holds a perimetral edge on each roller (6) on which are held small portions of a metallic carbon material sufficiently hard to grind the surface of the piece of stone.

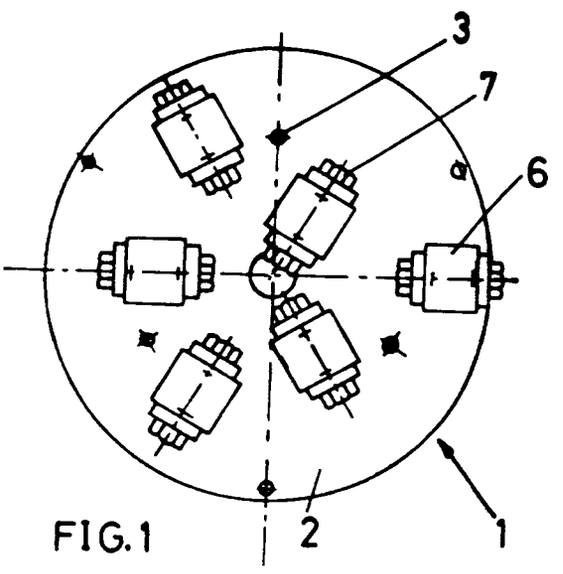

FIG.1

EP 0 555 608 A1

The present invention refers to a perfected apparatus to grind the surfaces of pieces of stone or similar materials.

As is known, there are tools and even machines to grind the surfaces of natural or artificial stone and also these machines and tools are limited both on the operating level and in the form of these grindings, since in many cases the percussion they produce causes the breaking of the pieces, particularly when the thickness of the pieces to he ground is not great.

The operational abilities of these machines and tools is limited by the low productivity achieved, which implies that these machines are not competitive.

There are also machines in which the rollers used move in grooves made in the attack surface. This implies serious problems since the grooves fill with water and bits of ground material, in many cases impeding the rotation of the rollers and thus the effectiveness of the grinding.

All these problems, both constructional and functional, are solved with the grinding apparatus of the invention, that has a simplified construction and high output for the constitution and layout of the grinding shaping rollers, thus obtaining optimum productivity.

In accordance with the invention, the grinding apparatus for the surfaces of stone or similar materials, is formed by a support, preferentially discoidal, placed parallel to the face or surface to he ground, and also on the lower side of the support pieces are attached appropriately to make some perforations made in the support coincide with drillings made in the said pieces, holding them with screws.

One of the novel characteristics of the invention consists in the discoidal support having some holes at 30° between each, that is, the drill holes are on ideal radii at 30° between each and also at a variable central distance from each other to achieve maximum operability.

Each part holding the roller has a "U" section in which the central branch has a hollowed out area on its inner face and perforations on each side to which are attached the screws that allow attachment of the piece to the discoidal support.

On the "U" shaped parallel faces there are holes facing each other in which are mounted a roller axle and also mounted on this axle are two sets of lateral bearings with caps and bushings and also mountings to aid the turn of the roller that has on its central part some metallic carbon projections on a perimetral edge that coincides with the central hollow made on the interior face of the central part of the "U" shape.

Every 60° on the supporting part are holes that serve to attach the part to the rotating head of the corresponding machine and then every 60° pairs of holes appear on the same radius, with a position that varies sequentially from the centre in order to cover the maximum surface with the smallest angle of the rollers, and to do this they are placed at different distances from the centre and also in different directions.

In order to more easily understand not only the constitution but also the use of the apparatus of the invention, reference is made below to a practical example, with this being merely enunciative and in no case limiting the same, the whole as shown in the attached drawings, in which:

Figure 1 shows a top view of the apparatus of the invention.

Figure 2 shows a side view of Figure 1.

Figure 3 shows a top view of the discoidal support for the rollers.

Figure 4 shows a sectional view of Figure 3.

Figure 5 shows an exploded and perspective view of the support pieces for one of the rollers and also the elements that aid in the turning of the same.

With reference to the drawings, these show: the perfected apparatus 1 to grind the surfaces of stones or similar.

The apparatus 1 is formed by a discoidal part 2 that has holes in a radial direction every 30°. Of these holes some are shown every 60° with number 3 and these are used to hold the part 2 to the rotating head of a machine, not shown.

The holes marked with number 4 are those placed on 60° radii in pairs at an equal distance but placed at different points on their radii.

These holes 4 are made to attach "U" shaped pieces 5 supporting the rollers 6 that are mounted on the axle 7 between the holes 8 made in the parallel arms 9.

Each axle has on its ends two sets of: a brass or bronze bushing 10, a plastic cap 11, a holder 12 placed in the groove 13 of the roller and a ball bearing 14.

Each roller 6 has a perimetral edge with small portions 5 of very hard metallic carbon, which grind the surfaces which are not shown.

On the interior face 16 of each "U" shaped piece 5 is a straight hollow 17 of a width similar to the edge of the parts 15, to avoid scraping against them.

On each side of the hollow 17 appear two holes 18 through which the "U" shaped parts 5 are attached with screws 19 to the turning discoidal part.

Having sufficiently described the nature of the invention and the manner of carrying it out in practice, it should he noted that the layouts indicated above and shown in the attached drawings may be modified in their details, provided this does

not alter the fundamental principle.

Claims

1. Perfected apparatus to grind the surfaces of pieces of stone or similar materials; characterised because it has: a discoidal part with perforations at 60° to each other to hold the same by screws to a rotating head on a machine, while at 60° and sequentially appear in a radial direction pairs of holes equidistant between each pair but at different distances from the centres of the pairs, on which are attached "U" shaped pieces with their parallel arms having holes in which are mounted the axle of a roller with elements that aid in the centering and turn of the same, with the central arm of each "U" shaped piece having on its internal surface a straight hollow of a width approximate to that given by a perimetral edging on each roller to which are attached small portions of a metallic carbon material sufficiently hard to grind the surface of the piece of stone; and because on each side of the straight hollow of the central arm appear holes by which the support part is attached through the holes in the discoidal part.

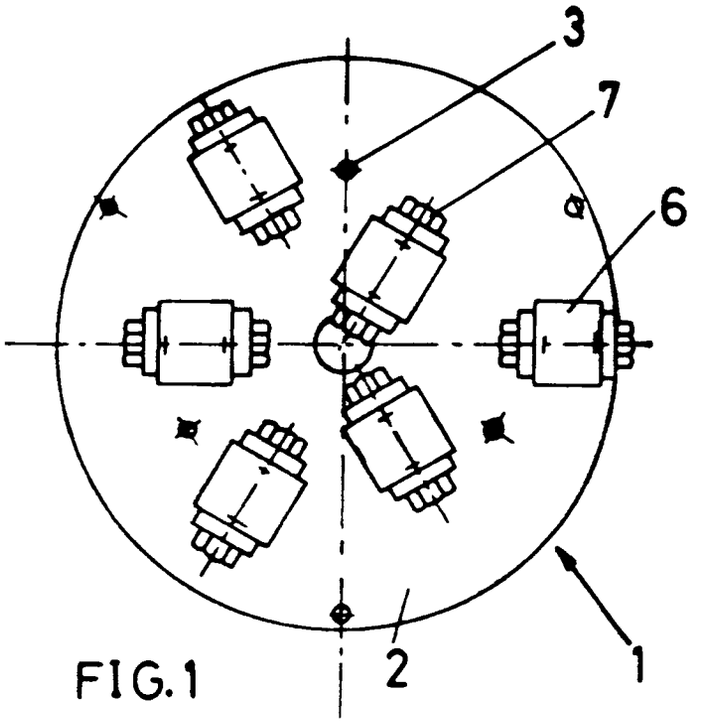

FIG.1

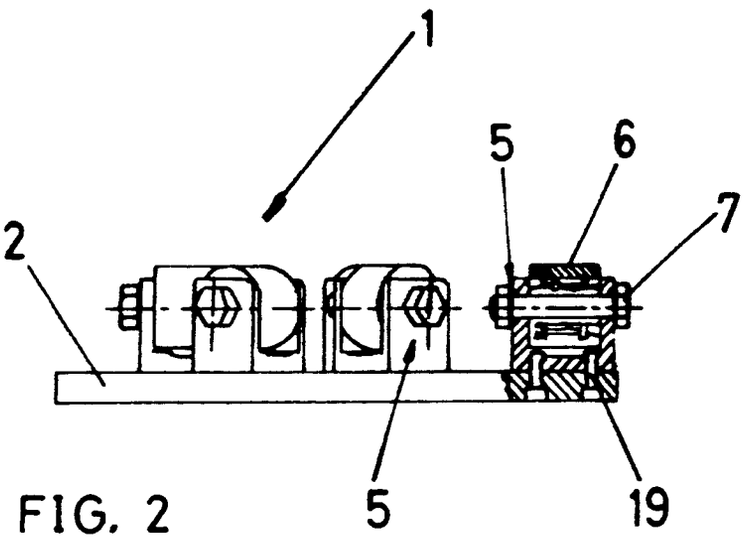

FIG. 2

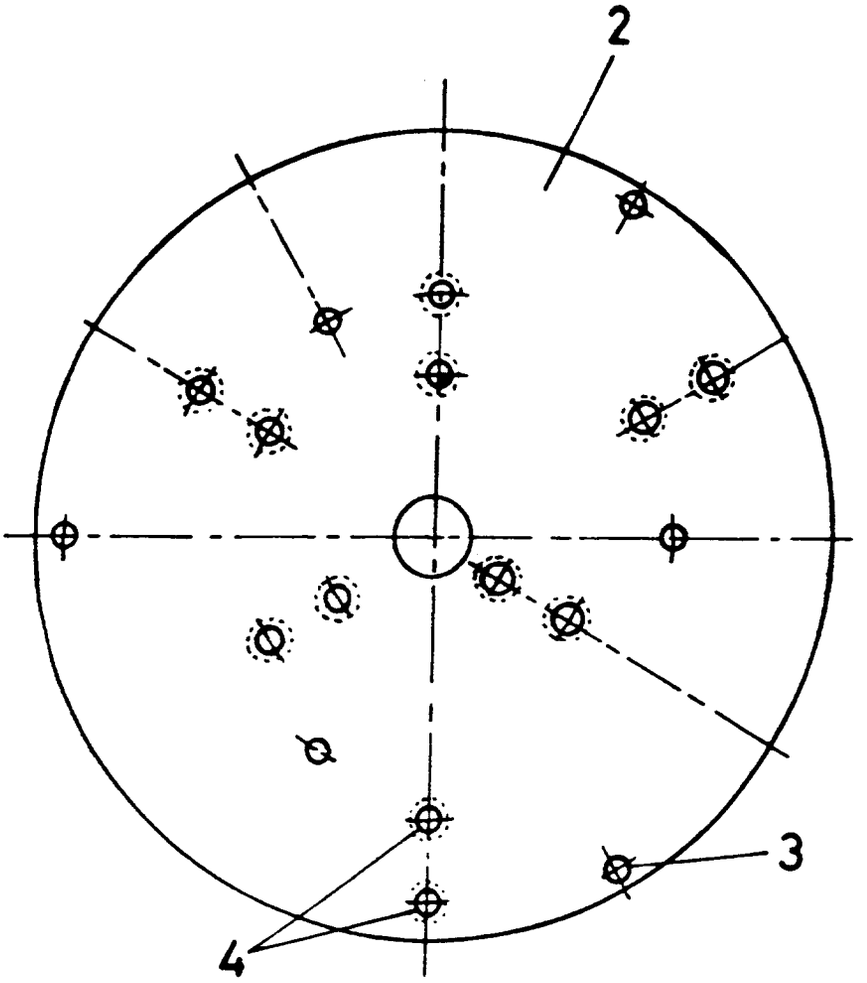

FIG. 3

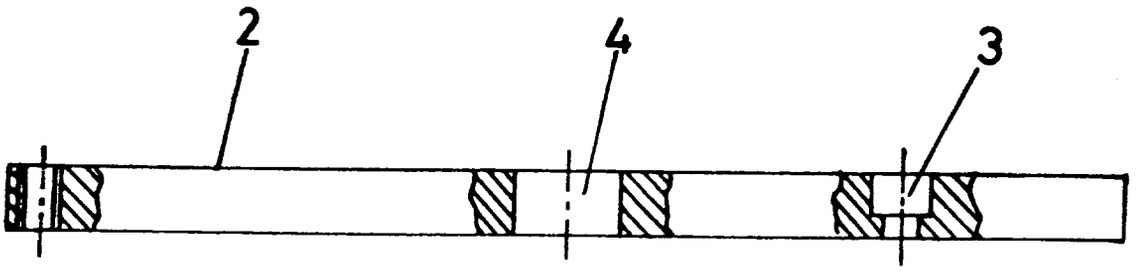

FIG. 4

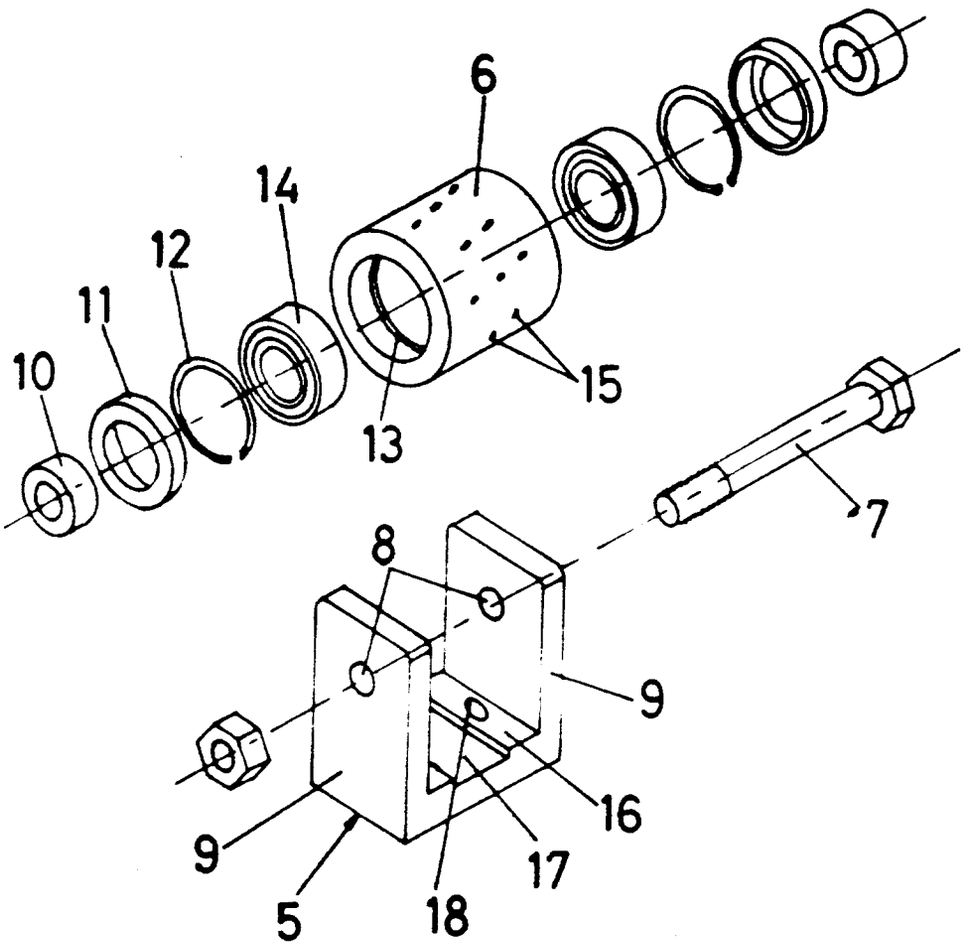

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number

EP 92 50 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.5)
Y	EP-A-0 429 893 (LUPATO ANTONIO EREDI SNC) * column 2, line 23 - column 3, line 24 * * column 4, line 20 - line 27 * * column 4, line 58 - column 5, line 11 * * figures 1,2 *	1	B28D1/18 B24B7/18
Y	US-A-4 155 596 (R.J. BREJCHA) * column 1, line 16 - line 18 * * column 3, line 11 - line 37 * * column 3, line 50 - line 60 * * column 4, line 6 - line 24 * * figures 3-5,6A,6B *	1	
A	GB-A-0 845 659 (COLUMBUS-DIXON LTD)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B28D
B24B
E01C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 MAY 1993	MOET H.J.K.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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