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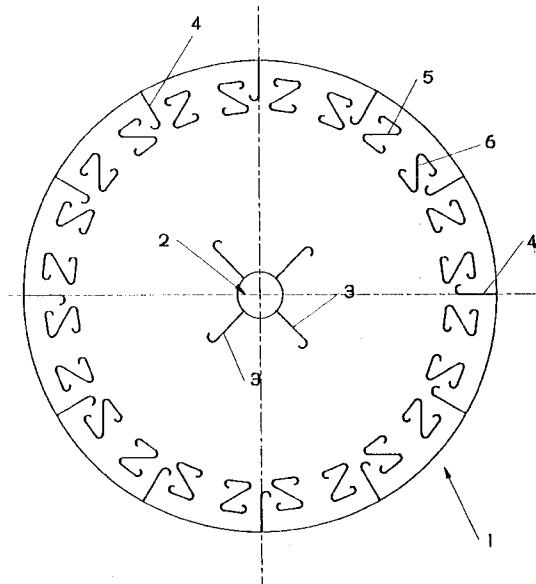
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(54) **Bearing disc for diamond tools, suitable for damping vibrations.**

(57) A bearing disc for diamond tools, e.g. a circular saw blade, comprising  
a set of radial cuts, near the disc hub ;  
a set of radial cuts, being staggered with respect to the former, near the outward edge ;  
a set of Z-shaped cuts, approximately near the outward edge.

The Z-shaped cuts are placed in pairs between said external radial cuts, the Z-shaped cuts of each pair being symmetrically placed with respect to a radius of the disc passing between them.

The cuts have their ends turned backwards.



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The present invention proposes a bearing disc for diamond tools of the kind used for the manufacture of circular saws for cutting stone materials and the like in which cuts having a particular shape and position are provided, suitable for damping and/or preventing vibrations when the tool is used.

Because of the configuration of the components, therefore, the use of the tool itself is more comfortable and practical.

As it is known in the art when using rotating disc tools, the arising of vibrations is often a cause of trouble, said vibrations being joined with noise, overstrain of materials and being even able to break the tool or the piece.

Besides "mechanical" vibrations caused by building inaccuracies (e.g. eccentricity or distribution of the masses being not exactly symmetric with respect to the axis of rotation), there are also "elastic" vibrations generated by the recall forces opposing the disc deformations produced by the resistance of the material being processed.

The latter are the most troublesome and harmful vibrations, which it would be convenient to eliminate.

At the present state of the art, in order to reduce the elastic deformations, the disc is stiffened by tensioning it in the area comprised approximately between a third and two thirds of the diameter of the disc itself.

However, this system presents considerable limits of reliability, as in practice it depends on the experience of the person tensioning, and, moreover, it turns out to be rather expensive.

Furthermore, by tensioning the disc, the problem of vibrations is not eliminated, since it is only possible to relieve their negative effect on the disc.

On the contrary, it would be convenient to eliminate this phenomenon, by damping or even preventing vibrations.

For this purpose the present invention proposes a bearing disc for diamond tools in which there is provided a plurality of conveniently placed cuts, being able to damp or prevent this phenomenon.

This and other purposes are gained by means of the bearing disc for diamond tools according to the part characterizing claims.

The present invention will be now described in detail, with reference to the only enclosed figure showing the front view of a bearing according to the invention.

Basically, the bearing is made up of a conveniently thick metal disc, indicated as a whole by 1, to which the diamond portions (not illustrated in the figure) are welded connected with the edge and which has an axial hole, indicated by 2, for applying the disc to the shaft of a machine which may be a saw for cutting stones or another apparatus known in the art.

The invention is characterized in that on the disc there is a set of cuts suitable for damping both tan-

gential and radial vibrations.

More particularly there is a set of cuts 3 extending radially from the axis of the disc for a certain portion of it, besides a plurality of peripheral cuts 4, being radially orientated too, starting from the outward edge of the disc and being a few millimeters deep (10-20 mm).

Both cuts 3 and cuts 4 in their end portion run curvilinearly, in particular they run on a line like a small semi-circumference.

Cuts 3 are staggered with respect to cuts 4, in the sense that a straight line passing through cuts 3 halves the area comprised between two external cuts 4.

On the contrary, in order to damp radial vibrations there is provided a further set of cuts, indicated by reference numbers 5 and 6, being placed according to an annular set approximately near the outward diameter of the disc and a circle having a diameter equal to about two thirds of the disc itself.

Cuts 5 and 6 have the shape of a "Z" with the edges turned backwards and they are symmetric, in the sense that each cut 5 is the specular image of the corresponding cut 6, each pair of cuts 5 and 6 being placed between two consecutive external cuts 4.

To sum up, the invention is characterized in that it provides for radial cuts near the outward diameter and the disc hub, one being staggered with another, and "Z"-shaped cuts, which are placed near the outward diameter. The former have the function of damping tangential vibrations, whereas the latter damp both tangential and radial vibrations.

A bearing disc is thus obtained for diamond tools making the use of these tools much more practical and cheaper, being able to damp or eliminate vibrations almost completely.

Obviously, it will be possible to vary the sizes, as well as the materials used, as occasion may require.

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## Claims

1. A bearing disc for diamond tools, characterized in that it provides:

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- a set of radial cuts, near the disc hub;
- a set of radial cuts, being staggered with respect to the former, near the outward edge;
- a set of "Z"-shaped cuts, approximately near the outward edge.

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2. A bearing disc according with Claim 1, characterized in that said "Z"-shaped cuts are placed in pairs between said external radial cuts, the "Z"-shaped cuts of each pair being specular with respect to a radius of the disc passing between them.

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3. A bearing disc according to any one of the pre-

ceding Claims, characterized in that said cuts have their ends turned backwards.

4. Circular cutting tools characterized in that they provide for a plurality of diamond portions set up on a bearing disc according to any one of the preceding Claims. 5
5. A bearing disc for diamond tools as described and illustrated. 10

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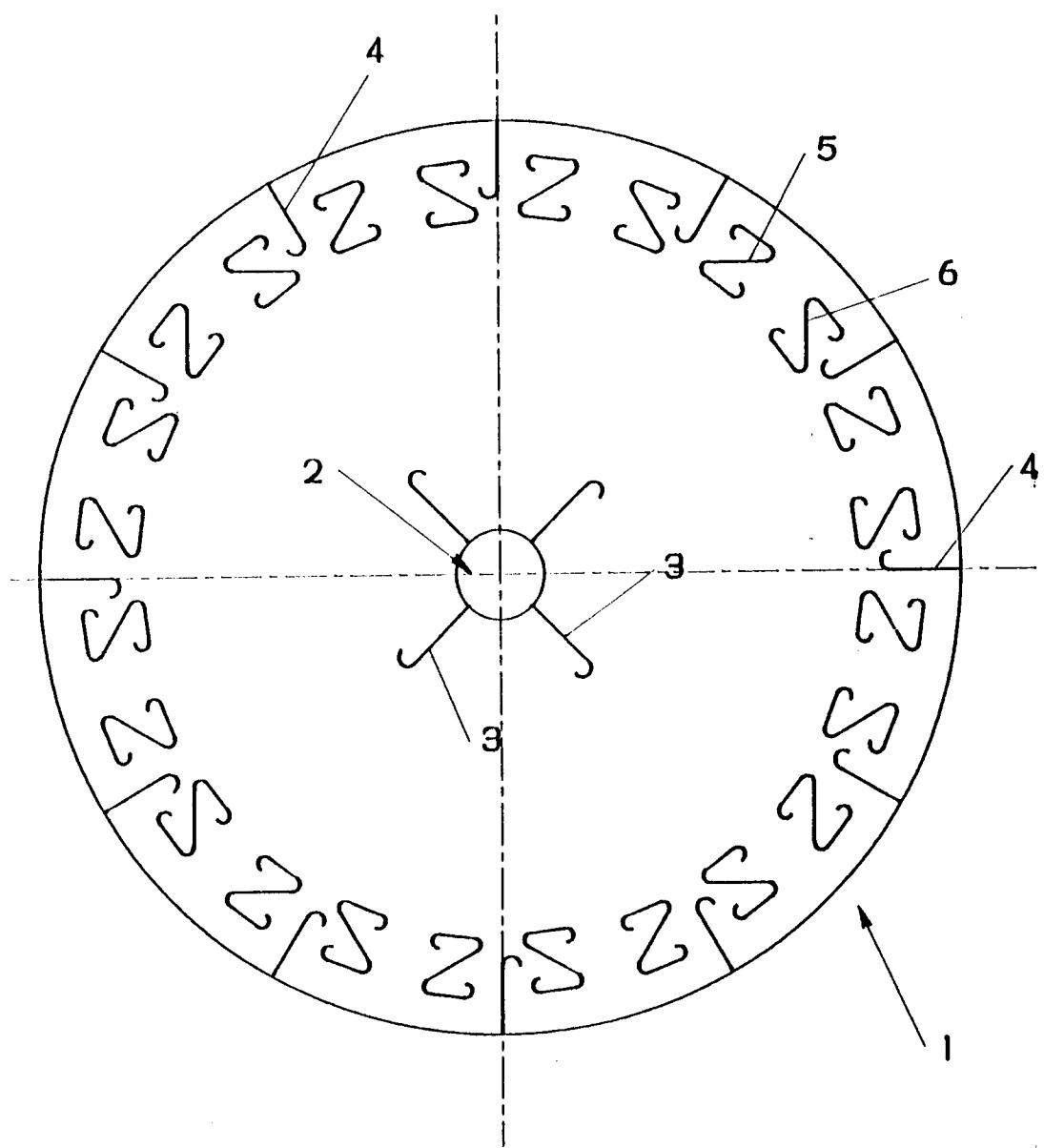
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## EUROPEAN SEARCH REPORT

Application Number  
EP 93 11 8503

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)						
A	WT/WERKSTATTSTECHNIK vol. 78, no. 6, June 1988, BERLIN (DE) pages 353 - 359 H. JANOWSKI 'Minderung von Schwingungen und Geräuschen bei scheibenförmigen Trennwerkzeugen' * page 356, paragraph 3.6; figure 7A * ---	1-5	B23D61/02						
A	WO-A-91 02626 (TYROLIT SCHLEIFMITTELWERKE SWAROVSKI KG) * page 5, line 10 - line 30; figure 1 * ---	1,3-5							
A	EP-A-0 102 626 (R. JANSEN-HERFELD) * page 2, line 20 - page 3, line 6; figures 1,2 * ---	1,3							
A	DE-U-76 01 953 (FIRMA RICHARD JANSEN) * page 3, line 4 - page 4, line 17; figures 1,2 * -----	1,3							
TECHNICAL FIELDS SEARCHED (Int.Cl.5)									
B23D									
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>2 February 1994</td> <td>Moet, H</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	2 February 1994	Moet, H
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CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document							
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document									