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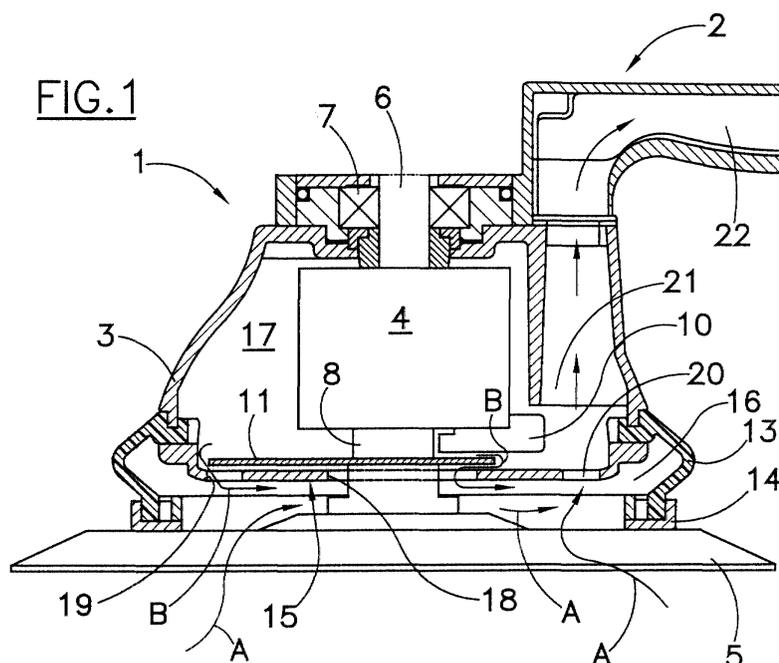
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(54) **Power-driven tool for machining surfaces**

(57) A power-driven tool for machining surfaces is described, comprising an external frame (3), driving mechanisms (4) housed inside said frame (3) and driven by a driving shaft (6), an operating wheel (5) that is made orbit around the axis of said driving shaft (6) by said driving mechanisms (4), a flexible annular cover (13) interposed between operating wheel (5) and said frame (3) for the collection of machining powders and sucking means (21, 22) for the machining powders comprising

a sucking mouth (21) that opens inside said cover (13). A dividing disc (15) is fastened to the frame (3) and interposed between said driving mechanisms (4) and said operating wheel (5) in order to subdivide the space above said operating wheel (5) into a lower chamber (16) communicating with said sucking mouth (21) through first holes (20) of the dividing disc (15) and into an upper chamber (17) communicating with said lower chamber (16) through second holes (19) of said dividing disc (15).



**Description**

**[0001]** The present invention concerns a power-driven tool for machining surfaces.

**[0002]** Power-driven tools are known, such as smoothing machines, sanding machines and so on, in which an operating wheel, usually called "abrading disc", is made to orbit around the axis of an opportunely controlled driving shaft.

**[0003]** A common problem with that kind of tools consists in the elimination of machining powders, that for the most part are sucked up through a duct that runs parallel or inside the handle of the tool, but that in small portion can reach the mechanisms that determine the orbital motion of the operating wheel, thus causing malfunctions and, in the long term, the blockage of the tool.

**[0004]** In order to solve the problem a proposal has been to tight close the upper zone of the tool, which comprises the driving mechanisms of the operating wheel, from the working area, where the machining powders get formed.

**[0005]** Object of the present invention is instead to solve the problem with the powders in a different way, which does not involve the tight closure of the upper zone of the tool.

**[0006]** According to the invention such scope is attained with a power-driven tool comprising an external frame, driving mechanisms that are housed inside said frame and driven by a driving shaft, an operating wheel that is made orbit around the axis of said driving shaft by said driving mechanisms, a flexible annular cover that is interposed between said operating wheel and said frame for the collection of the machining powders and means for sucking up the machining powders comprising a sucking mouth that opens inside said cover, characterised in that it comprises a dividing disc that is fastened to said frame and is interposed between said driving mechanisms and said operating wheel so as to subdivide the space above said wheel into a lower chamber communicating with said sucking mouth through first holes of the dividing disc and into an upper chamber communicating with said lower chamber through second holes of said dividing disc.

**[0007]** In this way the powder sucking flow develops inside the lower chamber along a very precise path, in which also the powders collected by suction from the upper chamber are conveyed. Without tight closing the two chambers it is thus prevented that the suction powders remain in contact with the driving mechanisms, thus dirtying and damaging them.

**[0008]** The characteristics of the present invention will become evident from the following detailed description of an embodiment thereof that is illustrated as a non-limiting example in the enclosed drawings, in which:

Fig. 1 shows a tool according to the invention in a schematic axial section;

Fig. 2 shows the dividing disc of the aforesaid tool

in top plan.

**[0009]** The tool shown in the drawings is for instance an orbital smoothing machine comprising a machining head 1 and a handle 2 extending laterally from the aforesaid head.

**[0010]** The machining head 1 comprises a rigid external frame 3, open at the bottom, in which a set 4 of driving mechanisms for an operating wheel or abrading disc 5 is housed.

**[0011]** The aforesaid mechanisms 4 are supported and driven by an opportunely controlled driving shaft 6, that is in turn revolvingly supported by the frame 3 through a bearing 7.

**[0012]** In turn the mechanisms 4 control, in a way known per se, the orbital movement of an eccentric hub 8, to which the operating wheel 5 is fastened in a removable way, that is thus in turn made orbit around the axis of the driving shaft 6. A counterweight 10 is associated with the driving mechanisms 4 in such a way as to follow the orbital movement of the hub 8 with an angular 180° phase-difference.

**[0013]** An eccentric blade 11 is fastened to the hub 8 so as to rotate with it. A button (not shown) slidingly supported by the frame 3 and projecting outside, when at rest, it is capable to engage, when the mechanisms are off and if pressed, with the blade 11 in order to stop the rotation of the same blade and to allow the unscrewing of the operating wheel 5 for maintenance and/or substitution purposes.

**[0014]** The operation of the blade 11 and the relative button is better described in the European Patent N. 0636454 in the name of the same Applicant, which also shows an embodiment of the mechanisms 4.

**[0015]** A flexible annular cover 13 made of rubber or similar is interposed and fastened between the frame 3 and a friction ring 14, that during the machining rests on the operating wheel 5 so as to prevent its rotation around its axis by friction, while allowing instead its orbital motion.

**[0016]** A rigid dividing disc 15 is fastened to the frame 3 between the operating wheel 5 and the eccentric blade 11, so as to subdivide the space above the same operating wheel into a lower chamber 16 and an upper chamber 17 in which the driving mechanisms 4, the counterweight 10 and the rotary blade 11 are housed.

**[0017]** The dividing disc 15 has a wide central hole 18 that is passed through by a hub 8, several round peripheral holes 19 that make up the communication between the two chambers 16 and 17 and two oblong peripheral holes 20 located under the sucking mouth 21 of a power sucking duct 22, than extends along the handle 2 of the tool and is provided with an exhauster not shown.

**[0018]** The presence of the bored dividing disc 15 creates in the lower chamber 16 an obliged path (arrows A) towards the oblong holes 20 and the sucking duct 22 for the machining powders that are created in the zone adjacent to the operating wheel 5. At the same time, ow-

ing to the depression that is created in the lower chamber 16, the holes 19 of the same dividing disc 15 allow the collection of the powders that have possibly reached the upper chamber 17 (arrows B), thus preventing the same powders from stagnating in contact with the driving mechanisms 4. In addition the dividing disc 15 prevents the accidental and dangerous contact with the blade 11 during the operations of maintenance or substitution of the operating wheel 5.

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### Claims

1. Power-driven tool for machining surfaces, comprising an external frame (3), driving mechanisms (4) housed inside said frame (3) and driven by a driving shaft (6), an operating wheel (5) that is made orbit around the axis of said driving shaft (6) by said driving mechanisms (4), a flexible annular cover (13) interposed between operating wheel (5) and said frame (3) for the collection of machining powders and sucking means (21, 22) for the machining powders comprising a sucking mouth (21) that opens inside said cover (13), **characterised in that** it comprises a dividing disc (15) fastened to said frame (3) and interposed between said driving mechanisms (4) and said operating wheel (5) in order to subdivide the space above said operating wheel (5) into a lower chamber (16) communicating with said sucking mouth (21) through first holes (20) of the dividing disc (15) and into an upper chamber (17) communicating with said lower chamber (16) through second holes (19) of said dividing disc (15).
2. Power-driven tool according to claim 1, **characterised in that** said dividing disc (15) is additionally provided with a wide central hole (18) for the passage of an eccentric hub (8) for the support of said operating wheel (5).
3. Power-driven tool according to claim 2, **characterised in that** it comprises an eccentric blade (11) fastened to said eccentric hub (8) above said dividing disc (15) in order to allow the locking of the hub (8) during the stage of substitution or maintenance of the operating wheel (5).

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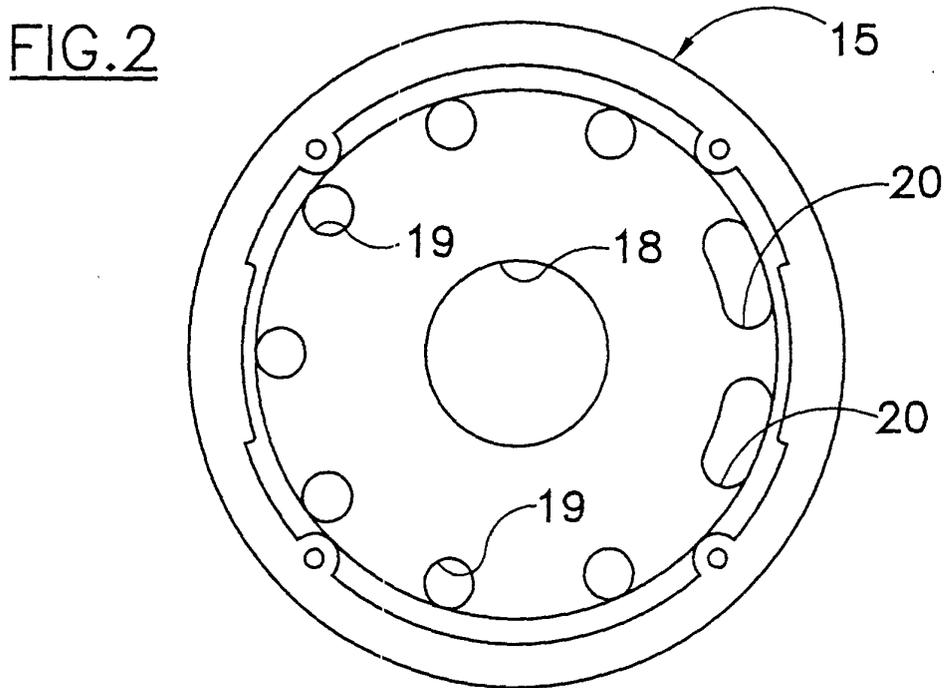
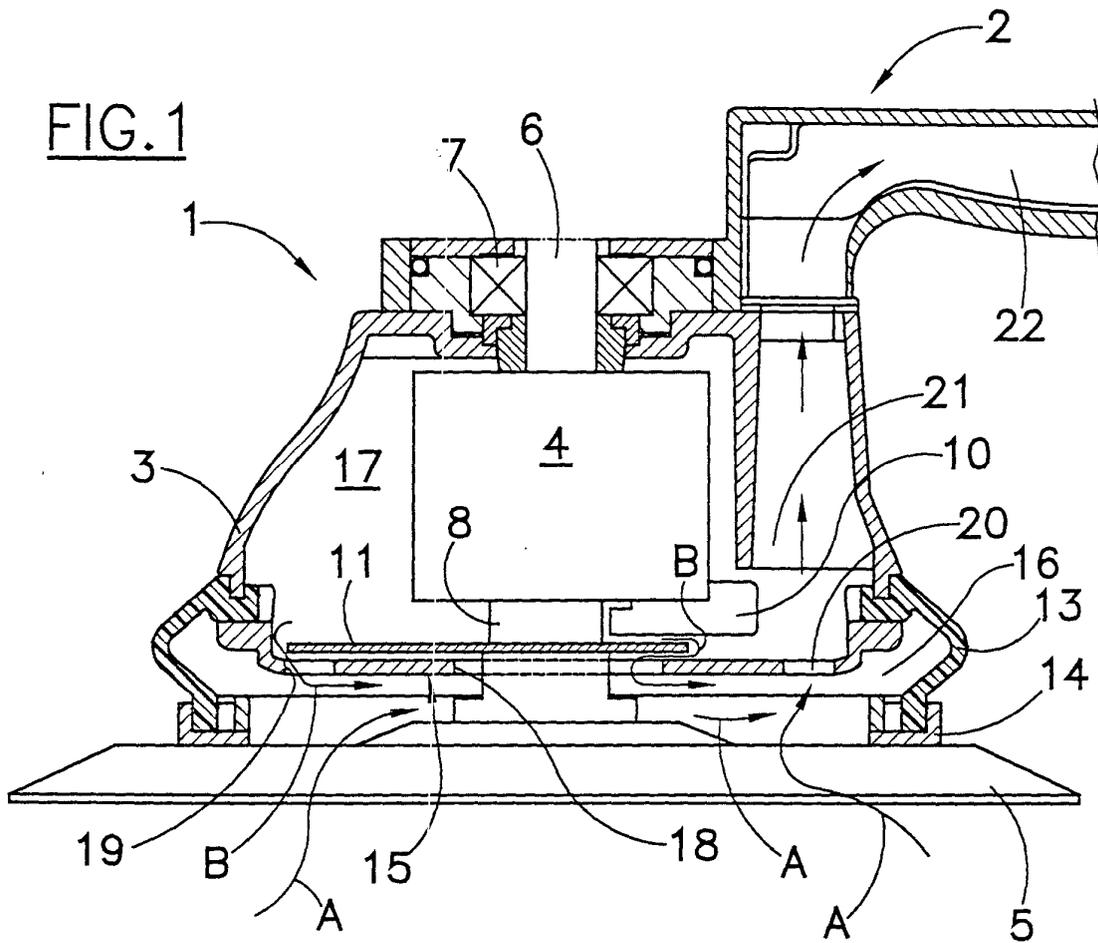
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European Patent  
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EUROPEAN SEARCH REPORT

Application Number  
EP 01 20 1178

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.7)
X	US 3 862 521 A (ISAKSSON) 28 January 1975 (1975-01-28) * column 1, line 58 - column 2, line 18; figures 1,2 *	1,2	B24B23/03 B24B55/10
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>11 July 2001</b>	Examiner <b>Garella, M</b>
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	
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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