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(54) ROTATING WORKBENCH

(57) The present invention relates to a rotating workbench whose main and final purpose is to promote an ergonomic position of a mold polishing operator, without having to move the mold in a traditional way since, in addition to rotating the mold 360° around itself, it allows a rotation between 0° and 90°, from horizontal to vertical position, of the face to be polished. The present invention comprises essentially a base (2), a left-hand side (3) and a right-hand side (4), on which at least a left-hand (5)

and/or a right-hand (6) outer sides are fixed through the connecting flanges (12) (13), which in turn provide lateral slewdrives (11) between them, with a moving part and a fixed part. The base (2) has a central slewdrive (7), which allows the rotation of the mold between 0° and 360° in a plane fixed by the user, which has a fixed part (8) and a moving part (9). It should be noted that the outer sides (5) (6) have a structural reinforcement (14) and that the mold is fixed on a rotating base (10).

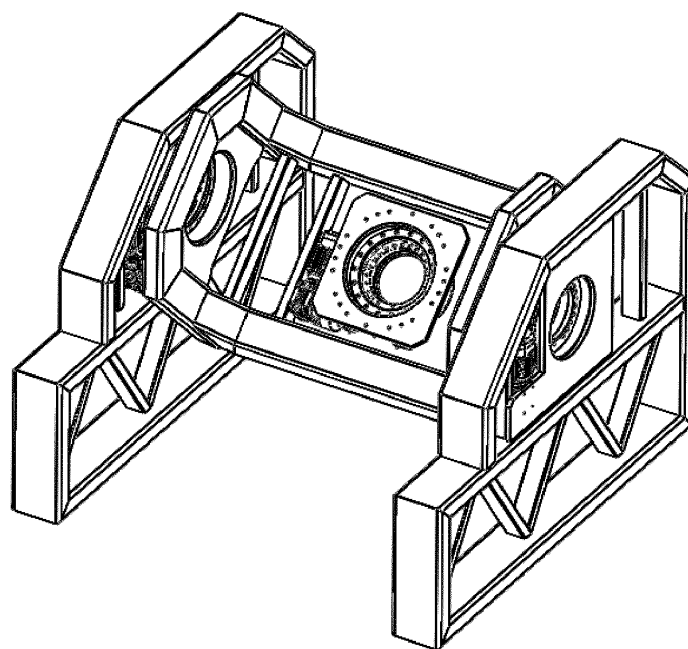


Fig. 5

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a rotating workbench whose main and final purpose is to promote an ergonomic position of a mold polishing operator. Currently the task of polishing a mold involves placing the mold on a workbench, where the operator polishes the mold by placing the mold in the best position as possible through a travelling crane, if any, and executes that polishing action on all the mold faces, regardless of its geometry and surface, which often implies a non-ergonomic position of the operator/user, sometimes causing imperfect works and consequently time-wastage in mold production.

[0002] The present invention relates to a workbench for a mold which is placed in the polishing phase, wherein the workbench allows the user not having to move himself, not having to move the mold as traditionally, with the travelling crane for instance, and not having to lose time with the successive operations in order to try placing the mold in the best position, and so he can execute the task of polishing all the mold faces in a comfortable position, in a sited position for example, since this is a rotating workbench which, in addition to rotating the mold 360° around itself through the first rotating axis, also allows a rotation between 0° and 90°, from horizontal to vertical position of the face to be polished, through the second rotating axis. With this equipment, the rotating movements of the mold in a position ergonomically more favorable to the operator can be easily achieved, allowing a greater comfort in its work, better execution in the mold polishing, faster execution of this function and avoiding potential errors in polishing.

[0003] The mold is tightened to a base of the machine, either with clamps or a screw-tightened device at the base, or by a magnetic plate. Polishing is executed using several tools appropriate for the type of face and the required type of surface.

SUMMARY OF THE INVENTION

[0004] The rotating workbench, which is the object of the present invention, has a supporting structure for housing the different components forming it and is mainly divided into:

- a central zone of the workbench (1) which is designated throughout all the document as the cradle (1) given its geometrical configuration, which consists of a base (2) with two perpendicular sides at each of its ends, being these designated as the left-hand side (3) and right-hand side (4). This cradle (1) is free to move the mold that is fixed on it between 0° and 360° using its own means which are described above and, simultaneously or not, moving the mold between 0° and 90° (Figs. 4, 5 and 6) in another

independent plane, which enables a very advantageous handling to the user regarding the access to the various mold faces and its geometrical features to be polished;

- at least one left-hand (5) and/or right-hand (6) outer sides, which are fixed to the left-hand (3) and right-hand (4) sides, respectively, using rotation and fastening means, and which represent the components that will support all the cradle (1) and, at least on one of them, the stresses resulting from the load and the angular movement are distributed throughout the structure of the rotating workbench.

[0005] These two rotations allow the user to remain in their initial working position, and he can place the mold on the face which is going to be polished, doing so in the most favorable position for the task, without having to change the position of the mold manually, and without having to remove and replace it in the workbench according to the area to be polished. In this way, accidents with the repositioning of the mold are avoided, as the user does not have to do it manually, not having to support the weight of the mold and sometimes placing himself in positions which are harmful for the vertebral column positioning, given the problematic geometry the mold presents in order to be transported by a human being.

DETAILED DESCRIPTION OF THE INVENTION

[0006] As noted above, the rotating workbench object of the present invention has:

- a central zone of the workbench (1), the cradle (1), which consists of a base (2) with two perpendicular sides, a left-hand side (3) and a right-hand side (4). The cradle (1) allows the rotation of the mold, this one is fixed at its base, between 0° and 360° relative to its rotation axis perpendicular to the sides (3) (4), using fastening and rotation means which are present between the left-hand (3) and right-hand (4) sides of the cradle and the right-hand (6) and left-hand (5) outer sides;
- in turn, the cradle (1) can rotate between 0° and 90° regardless of the rotation mentioned above, which is provided by its connection to at least one right-hand (6) and/or left-hand (5) outer sides.

[0007] It is now essential to describe each of these components, and the preferred means allowing the two rotations mentioned. In the scope of the invention, slew drive is a reducing motor mechanism with gear and an integrated worm shaft, or may also be a conventional reducing motor driving a gear ring in the cradle, as the first axis.

[0008] The positioning/movement from 0° to 90° of the second axis is executed through two slew drives (11) (as shown in the Figures) similar to those described above, placed on each of the outer sides (5) (6) in order to move

the cradle (1) set, and which can alternatively be made through of one or two conventional reducing motors and driving in a kind of half-gear ring, or also through the placement of a hydraulic motor and respective hydraulic cylinders which place the cradle in the 90° position with its driving.

[0009] The cradle (1) consists of a base (2) and two left-hand (3) and right-hand (4) sides perpendicular to the base (2), and this one may consist of a welded tubular structure (260 × 180 × 10 and 200 × 100 × 12) and reinforcements (100 × 50 × 3). An electric motor is placed on the base (2) and feeds a central slew drive (7), which allows the rotation of the mold between 0° and 90° in a plane fixed by the user.

[0010] This central slew drive (7) has two different parts, a rotating and a fixed part:

- the fixed part of the central slew drive (7) is fixed to the base through a fixing flange (8), preferably having an external diameter of 395mm, an internal diameter of 245mm and a thickness of 20mm, and it is screwed using M16 class 8.8 bolts with a torque of 197Nm;
- the movable part is preferably a rotating connecting flange (9), which preferably has an external diameter of 457mm and an internal diameter of 345mm, and it is screwed using M16 class 12.9 bolts with a torque of 333 Nm.

[0011] All the loads exerted by the mold are centered on the central slew drive (7), and so the stresses are equally divided among the left-hand (3) and right-hand (4) sides, since it can be ensured that the exerted stresses and/or displacements are exactly equal on the left and right sides.

[0012] It is worth noting now that the connections of the cradle (1) to the left-hand (5) and right-hand (6) outer sides are made in the same manner, and thus only the connection to the left-hand outer side (5) is described, which is achieved through the connecting flanges (12) (13) and a mechanical tube of 16mm thickness, in order to ensure the displacement of the cradle (1) without interfering with the outer sides (5) (6). If only one right-hand (6) or left-hand (5) outer side exists, the end which does not have the outer side will be fixed through means that allow its rotation even without the presence of the Slew Drive (11), thus leading to a reduction in the manufacturing costs of the bench and also in its size. Also, the load is lower in this preferred embodiment as compared with the case with both outer sides (5) (6) and Slew Drives (11), in which it is much higher.

[0013] The left-hand (5) and right-hand (6) outer sides consist preferably of a rectangular tube (250 × 100 × 10) with reinforcements (100 × 50 × 3), wherein the electric motor driving the side Slew Drives (11), which also have a moving part and a fixed part, executes the movement of the cradle (1).

[0014] Thus the fixed part of the lateral Slew Drive (11)

is fixed to the left-hand outer side (5) through a fixing flange (13) which preferably has an external diameter of 395 mm, an internal diameter of 245 mm and a thickness of 20mm. To ensure that everything moves without collisions a mechanical tube with the thickness of 16 mm was inserted through welding to the 20 mm thickness, and it was screwed using M16 class 8.8 bolts with a torque of 197 Nm.

[0015] The moving part is preferably a rotating connecting flange (12) which preferably has an external diameter of 457mm and an internal diameter of 345mm, and an inserted mechanical tube with a thickness of 16 mm, and it was screwed using M16 class 12.9 bolts with a torque of 333 Nm, which allows the movement from 0° to 360° of the cradle (1), wherein the outer sides (5) (6) have a structural reinforcement (14), since these outer sides (5) (6) support all the efforts

[0016] It is also worth noting that the mold is fixed on a rotating base (10), which for this reason has a predrilling that allows the tightening of different molds until reaching a maximum value of 5 tons, and there are tightening clamps to fix the mold to the rotating base (10), thus ensuring full fixation.

[0017] The rotating base (10) has a movement between 0° and 360° through the same rotational movement of the central Slew Drive (7), since it is fixed to the rotating part of the central Slew Drive (7) using the rotating connecting flange (9). In turn, and simultaneously or not, the cradle (1) has a freedom of rotation from 0° to 90° through the movements executed by the side Slew Drives (11), wherein the combination of these two movements allows the freedom to position the mold where it is more favorable to be worked on.

[0018] In order the workbench becomes more ergonomic, this one can have adjustable feet allowing the adjustment to the rotating workbench, and also have conventional means to command and control the motors, wherein the electric motors also have an emergency stop device. This machine is equipped with a signaling device of movement, connected and malfunctioning status, and it also has two support bases with three air intakes and a single-phase socket, in order to help the operator to execute the polishing function.

Claims

1. Rotating workbench **characterized in that** it comprises:

- a) a base (2);
- b) a left-hand side (3) and a right-hand side (4), perpendicular to the base (2) and located at each of its ends;
- c) a rotating base (10) located between the sides (3) (4), to which a mold is fixed, parallel to the base (2);
- d) connecting means (8) to the base (2) and

- connecting means (9) to the rotating base (10),
located between said bases (2) (10);
- e) rotating means (7) located between the connecting means (8) (9), which rotate the rotating base (10) perpendicularly to the sides (3) (4) between 0° and 360°; 5
- f) at least a left-hand (5) and/or a right-hand (6) outer side parallel to the sides (3) (4), respectively;
- g) connecting means (12) to sides (3)(4), and connecting means (13) to the outer sides (5)(6), both connecting means (12) (13) being located between the sides (4) (6) and the sides (3) (5); 10
- h) rotating means (11) located between the connecting means (12) (13), which rotate the base (2) perpendicularly to the outer sides (5) (6) between 0° and 90°. 15
2. Rotating workbench according to the previous claim wherein the base (2) has an electric motor which drives a rotation means (7). 20
3. Rotating workbench according to the preceding claims wherein the rotation means (7) consists of a slew drive with a part fixed to the base (2), preferably through a fixing flange (8), and a rotating connecting flange (9). 25
4. Rotating workbench according to the preceding claims wherein the rotation means (11) consists of two slew drives with a part fixed to the sides (5) (6), preferably through two fixing flanges (13), and two rotatable connecting flanges (12). 30
5. Rotating workbench according to the preceding claims wherein the outer sides (5) (6) have a structural reinforcement (14). 35

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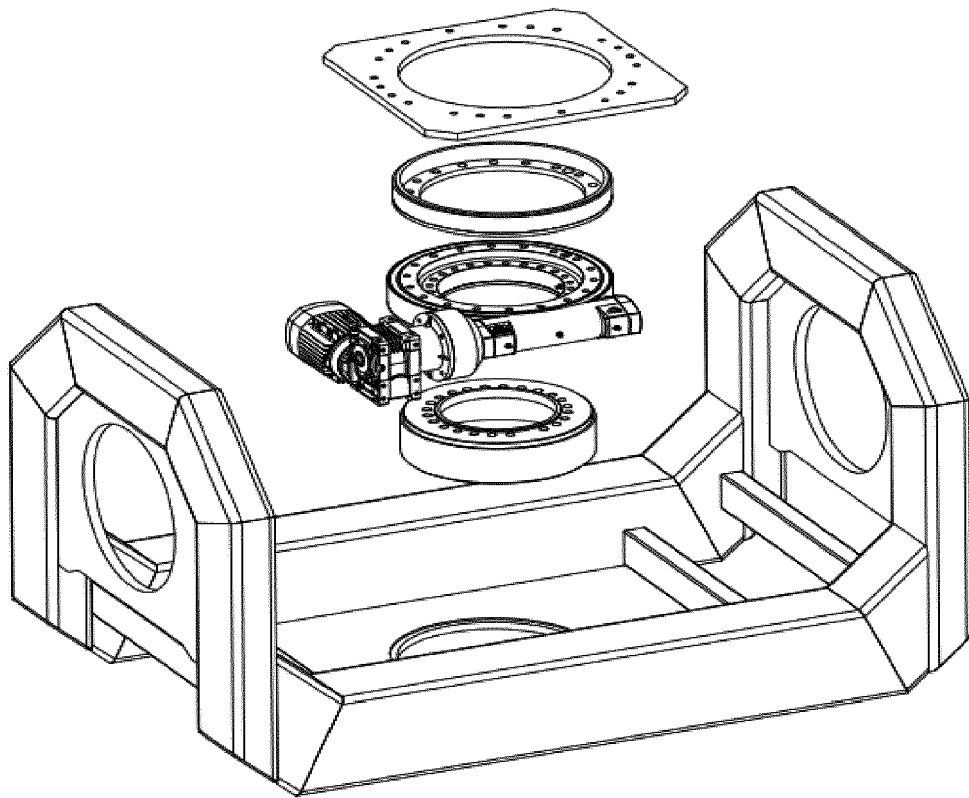


Fig. 1

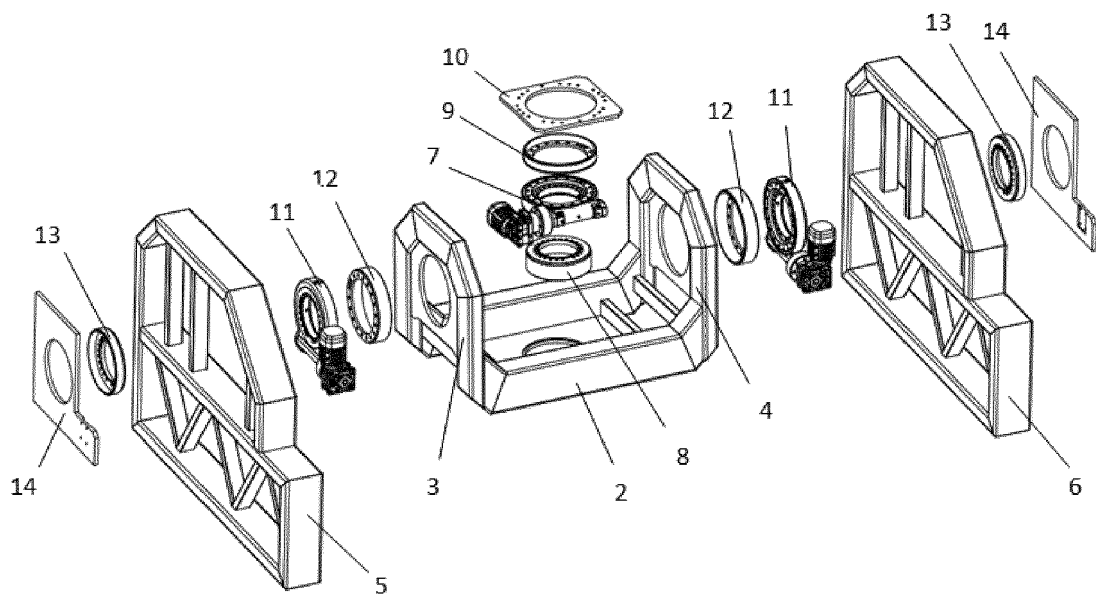


Fig. 2

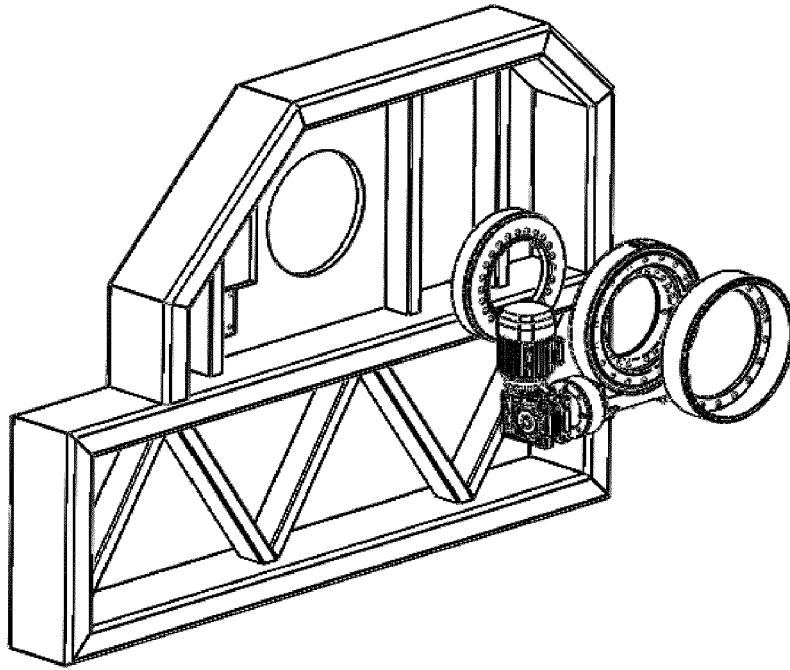


Fig. 3

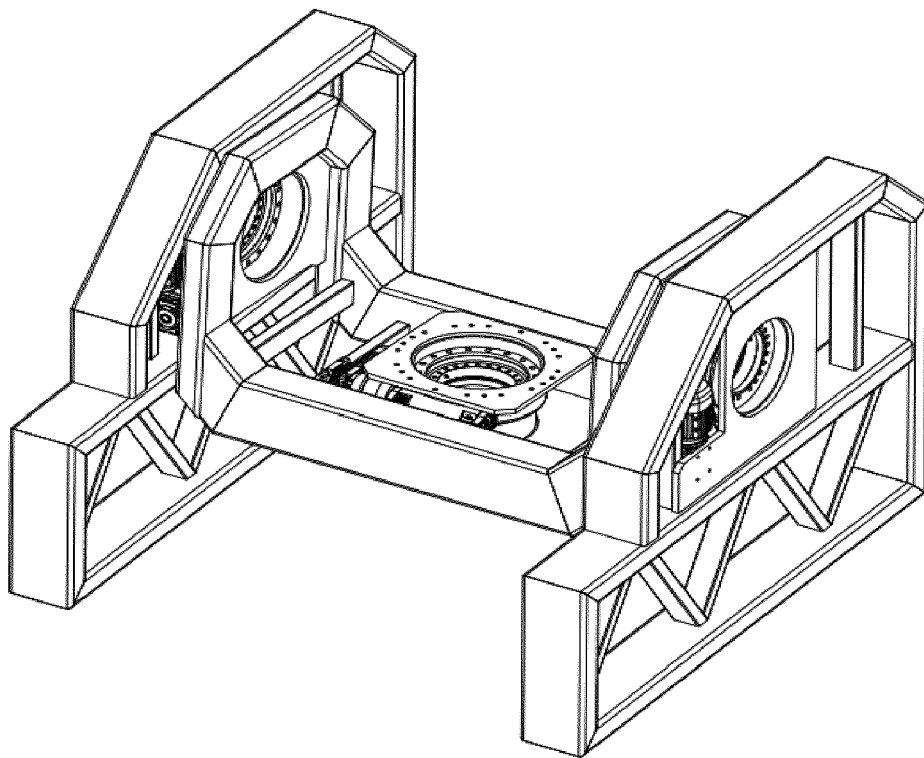


Fig. 4

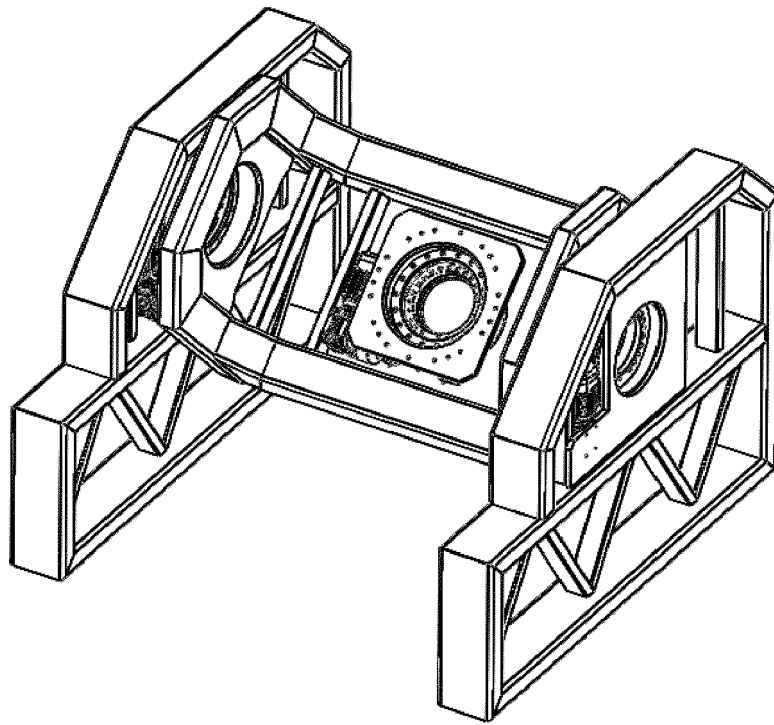


Fig. 5

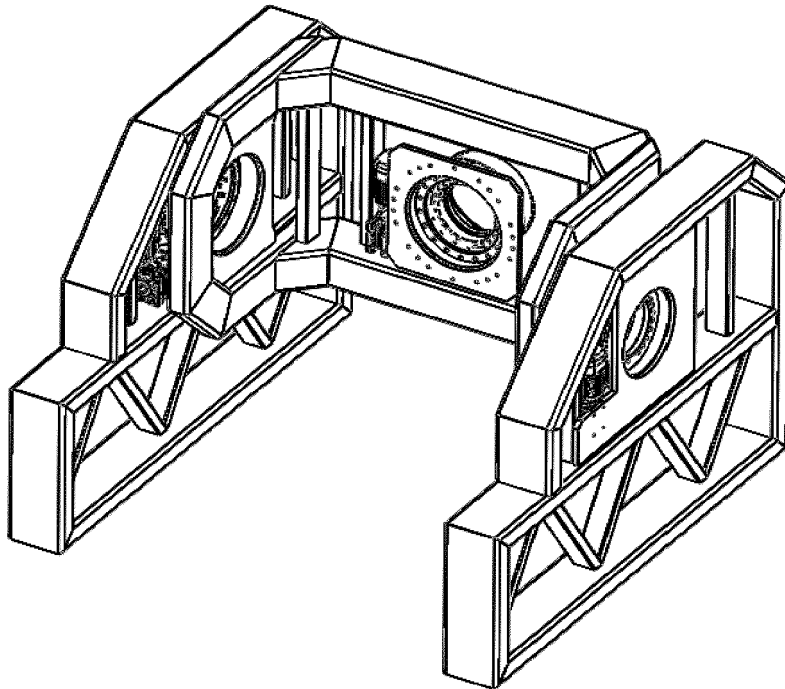


Fig. 6



EUROPEAN SEARCH REPORT

 Application Number
 EP 18 19 7016

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2013/164296 A1 (CANUTO ALMERINO [IT]) 7 November 2013 (2013-11-07) * page 1 * * page 2, line 24 - page 4, line 17 * -----	1-5	INV. B25H1/18 B24B23/00
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 February 2019	Examiner Gerard, Olivier
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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06-02-2019

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