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(54) **Machine for working components of wood or similar**

(57) A machine for working components (2) of wood or similar has a base (3); a number of clamps (8) fitted to the base (3) to secure at least one component (2) ; an operating head (12) equipped with at least one cutting tool (21) to work the component (2) ; and a sharpening device (24) for sharpening the cutting tool (21) .

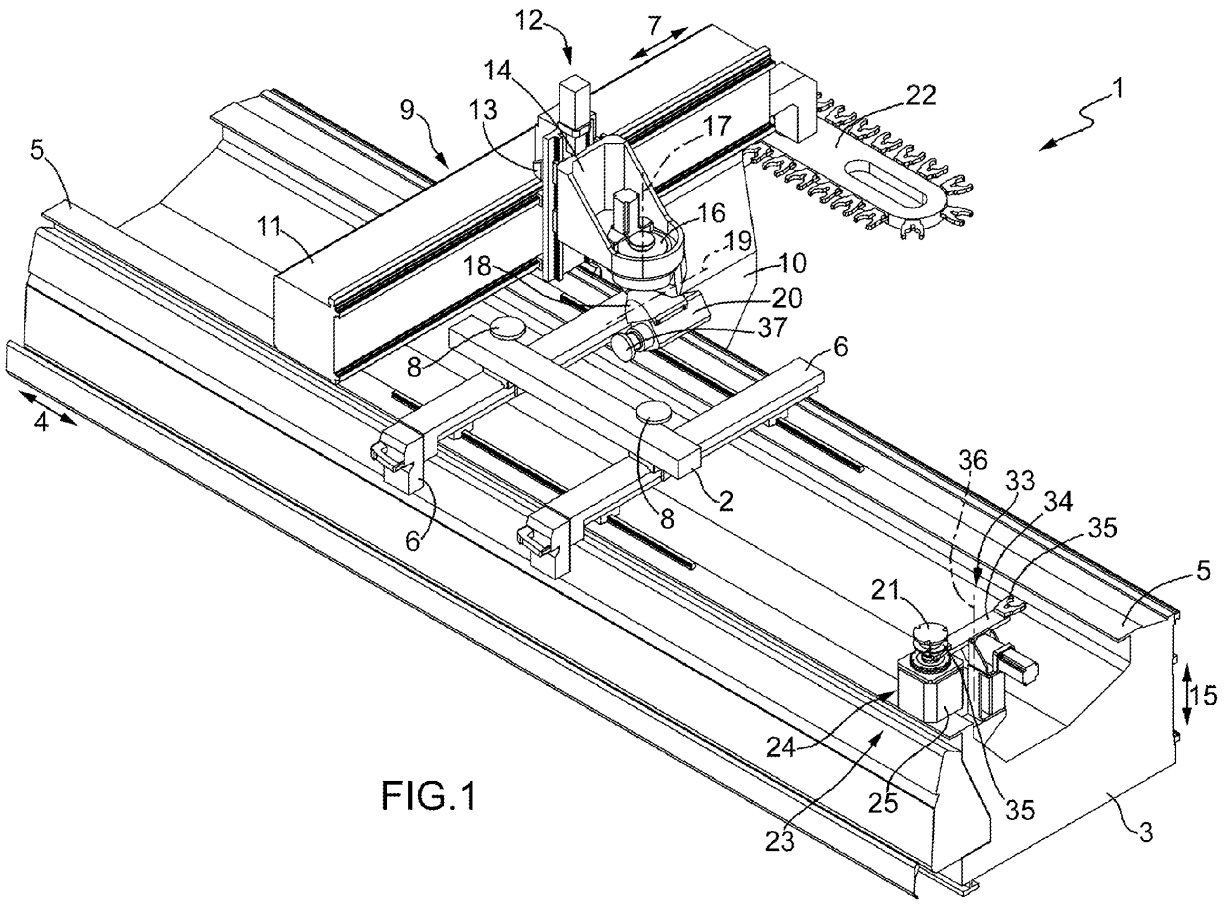

FIG.1

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Description

[0001] The present invention relates to a machine for working components of wood or similar.

[0002] In the woodworking industry, a machine is used comprising an elongated base with two longitudinal guide members parallel to a substantially horizontal first direction; a number of cross members mounted between the longitudinal guide members, parallel to a substantially horizontal second direction and crosswise to the first direction; at least one clamp fitted to each cross member to receive and retain at least one component; and a bridge crane, which extends over the base, in the second direction, is fitted with an operating head for working the components, and moves along the base in the first direction.

[0003] The operating head normally comprises at least one electrospindle for receiving and retaining a component cutting tool - in this case, a milling tool.

[0004] Known machines of the above type for working components of wood or similar have several drawbacks, mainly due to the cutting tool, when it needs sharpening, having to be replaced and sent off to a specialized tool sharpening firm.

[0005] It is an object of the present invention to provide a machine for working components of wood or similar, designed to eliminate the above drawbacks, and which is cheap and easy to produce.

[0006] According to the present invention, there is provided a machine for working components of wood or similar, as claimed in the accompanying Claims.

[0007] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which :

Figure 1 shows a schematic view in perspective, with parts removed for clarity, of a preferred embodiment of the machine according to the present invention;
Figure 2 shows a schematic, partly sectioned side view of a detail of the Figure 1 machine.

[0008] Number 1 in Figure 1 indicates as a whole a machine for working elongated components 2 of wood, and comprising an elongated, substantially U-shaped base 3, which extends in a horizontal direction 4, has two lateral longitudinal guide members 5 parallel to direction 4, and supports a number of cross members 6 - hereinafter referred to as 'work surfaces' - which extend between longitudinal members 5 in a horizontal direction 7 crosswise to direction 4, and are fitted to longitudinal members 5 to slide manually, or by means of respective known actuating devices (not shown), along longitudinal members 5 in direction 4.

[0009] Work surfaces 6 support a number of clamps 8 arranged on work surfaces 6 substantially according to the size of and the work to be performed on components 2, and which are movable between a clamped position and a release position clamping and releasing at least one component 2.

[0010] Base 3 also supports a. bridge crane 9 comprising an upright 10, which is fitted in known manner to base 3, is movable straight along base 3 in direction 4 by a known actuating device (not shown), and is fitted on its free end with a cross member 11 extending over base 3 in direction 7.

[0011] Bridge crane 9 supports a known operating head 12 comprising, in the example shown, a horizontal slide 13 fitted in known manner to cross member 11 and movable straight along cross member 11 in direction 7 by a known actuating device (not shown).

[0012] Head 12 also comprises a vertical slide 14 fitted in known manner to slide 13 and movable straight along slide 13 in a vertical direction 15 perpendicular to directions 4 and 7 by a known actuating device (not shown); a swivel plate 16 fitted to slide 14 and rotated with respect to slide 14 about an axis of rotation 17 parallel to direction 15 by a known actuating device (not shown) ; and an adjustable arm 18, which is fitted to plate 16 to rotate with respect to plate 16 about a substantially horizontal axis of rotation 19 crosswise to axis 17, and supports an electrospindle 20 for receiving and retaining a milling tool 21 for working components 2.

[0013] Machine 1 also comprises a known tool store 22 fixed to bridge crane 9; and a sharpening station 23 for sharpening tools 21.

[0014] As shown in Figure 2, station 23 is equipped with a sharpening device 24 comprising a supporting block 25 fixed to the top surface of one of longitudinal members 5, and housing an electric motor 26, the rotor 27 of which is mounted to rotate with respect to block 25 about its own longitudinal axis 28 parallel to direction 15, and has a substantially truncated-cone-shaped top seat 29 coaxial with axis 28 and for receiving a tubular shank 30 of a tool 21.

[0015] Shank 30 is locked axially and angularly inside seat 29 by a known tie 31, which extends in direction 15 through rotor 27, is fitted to block 25 to slide straight with respect to block 25 in direction 15, and comprises a number of gripping arms 32 equally spaced about axis 28 and movable radially between a collapsed position allowing insertion of tie 31 inside shank 30, and an expanded position gripping shank 30 inside seat 29.

[0016] Device 24 cooperates with a transfer device 33 for transferring tools 21 between electrospindle 20 and block 25, and which comprises a rotary arm 34 fitted on the ends with two opposite grippers 35. Arm 34 is mounted to rotate about a rotation axis 36 parallel to direction 15, and is fitted in known manner to base 3 to also move straight with respect to base 3 in direction 15.

[0017] In actual use, at the end of a machine cycle, tool 21 is moved by bridge crane 9 into station 23, where device 33 removes tool 21 from electrospindle 20 and inserts it into block 25, with shank 30 inside seat 29.

[0018] Next, head 12 is first moved by bridge crane 9 over to store 22, from which electrospindle 20 removes a sharpening tool 37 - in this case, a grinding wheel, and

then back to station 23 to position tool 37 in a work position engaging tool 21.

[0019] By combining the movements of electrospindle 20 in directions 4, 7 and 15 and about axes 17 and 19 with the rotation of tool 21 about axis 28, tool 21 is sharpened relatively quickly, easily and cheaply by tool 37, preferably during the downtime of machine 1.

[0020] In a few variations not shown :

tool 21 is sharpened with tool 37 mounted permanently on device 24, and tool 21 mounted on head 12;
tool 21 or 37 is fitted manually to device 24;
motor 26 is eliminated, seat 29 is fixed, and tool 21 is sharpened by electrospindle 20 rotating tool 21 or 37;
block 25 is movable along relative longitudinal member 5 in direction 4;
block 25 is adjustable about at least one horizontal axis of rotation crosswise to axis 28; and
sharpening device 24 is fitted to cross member 11.

Claims

1. A machine for working components (2) of wood or similar, the machine comprising a base (3); clamping means (8) fitted to the base (3) to secure at least one component (2); an operating head (12) equipped with at least one cutting tool (21) to work the component (2); and a sharpening device (24) for sharpening said cutting tool (22); and being **characterized in that** the sharpening device (24) comprises a chuck (27, 29) fitted to the base (3) to receive and retain a sharpening tool (37); the operating head (12) and the sharpening device (24) being movable with respect to each other to and from a work position, in which the sharpening tool (37) engages the cutting tool (21).

2. A machine for working components (2) of wood or similar, the machine comprising a base (3); clamping means (8) fitted to the base (3) to secure at least one component (2); a bridge crane (9) fitted to the base (3); an operating head (12) fitted to the bridge crane (9) and equipped with at least one cutting tool (21) to work the component (2); and a sharpening device (24) for sharpening said cutting tool (21); and being **characterized in that** the sharpening device (24) comprises a chuck (27, 29) fitted to the bridge crane (9) to receive and retain a sharpening tool (37); the operating head (12) and the sharpening device (24) being movable with respect to each other to and from a work position, in which the sharpening tool (37) engages the cutting tool (21).

3. A machine for working components (2) of wood or similar, the machine comprising a base (3) ; clamping means (8) fitted to the base (3) to secure at least one component (2) ; an operating head (12) equipped with at least one cutting tool (21) to work the component (2) ; and a sharpening device (24) for sharpening said cutting tool (21); and being **characterized in that** the sharpening device (24) comprises a chuck (27, 29) fitted to the base (3) to receive from the operating head (12) said cutting tool (21), and a sharpening tool (37) fittable to the operating head (12) ; the operating head (12) and the sharpening device (24) being movable with respect to each other to and from a work position, in which the sharpening tool (37) engages the cutting tool (21).

4. A machine for working components (2) of wood or similar, the machine comprising a base (3); clamping means (8) fitted to the base (3) to secure at least one component (2); a bridge crane (9) fitted to the base (3); an operating head (12) fitted to the bridge crane (9) and equipped with at least one cutting tool (21) to work the component (2); and a sharpening device (24) for sharpening said cutting tool (21); and being **characterized in that** the sharpening device (24) comprises a chuck (27, 29) fitted to the bridge crane (9) to receive from the operating head (12) said cutting tool (21), and a sharpening tool (37) fittable to the operating head (12); the operating head (12) and the sharpening device (24) being movable with respect to each other to and from a work position, in which the sharpening tool (37) engages the cutting tool (21).

5. A machine as claimed in Claim 3 or 4, and also comprising a transfer device (33) for transferring the cutting tool (21) between the operating head (12) and the chuck (27, 29) .

6. A machine as claimed in any one of the foregoing Claims, wherein the chuck (27, 29) is fixed about its longitudinal axis (28).

7. A machine as claimed in any one of Claims 1 to 5, wherein the chuck (27, 29) is mounted to rotate about its longitudinal axis (28).

8. A machine as claimed in any one of the foregoing Claims, and also comprising a first actuating device for adjusting the chuck (27, 29) about at least one axis of rotation substantially crosswise to the longitudinal axis (28) of the chuck (27, 29).

9. A machine as claimed in any one of the foregoing Claims, wherein the operating head (12) comprises a second actuating device (20) for rotating the cutting tool (21) or the sharpening tool (37).

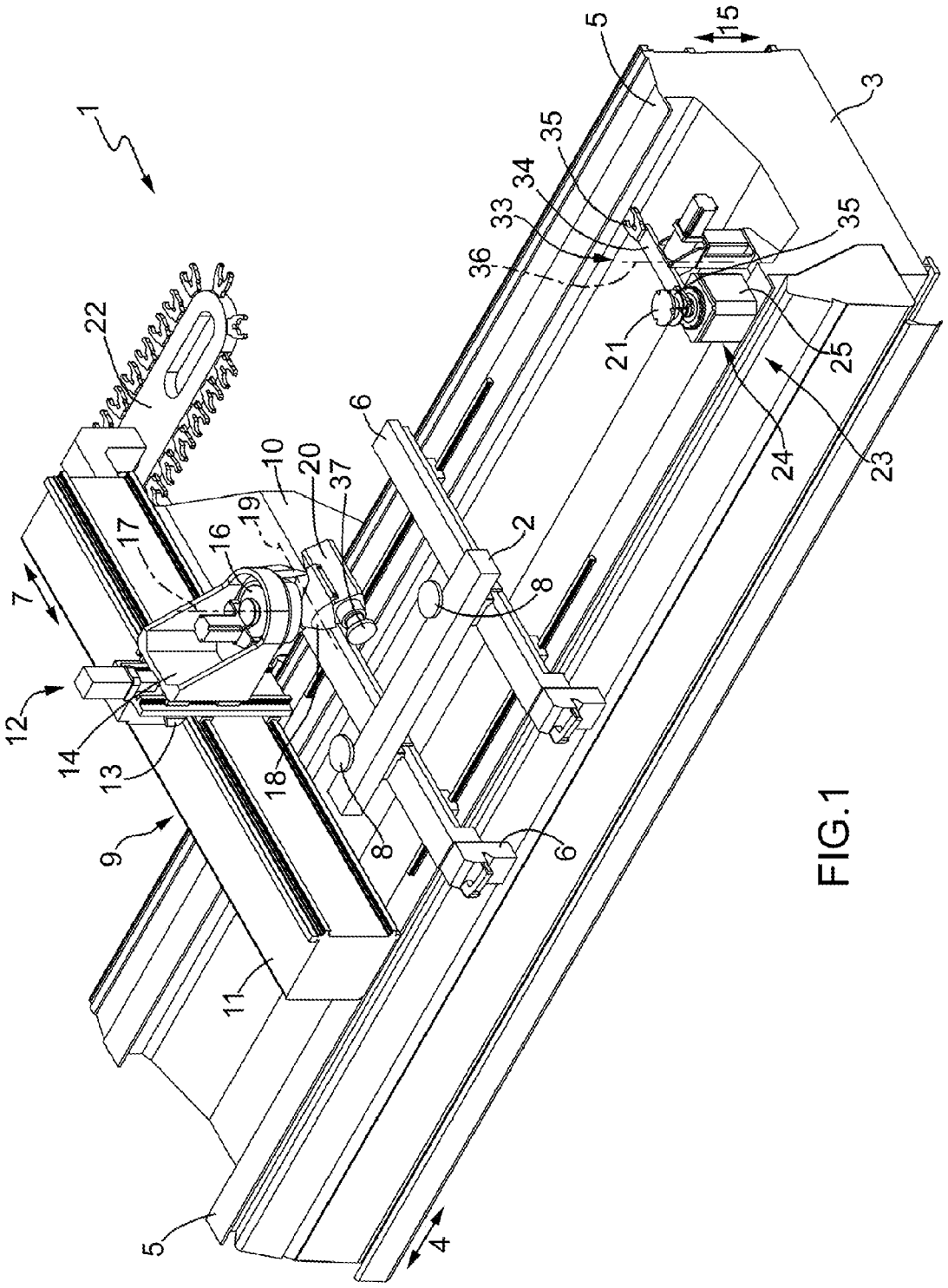
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FIG.1

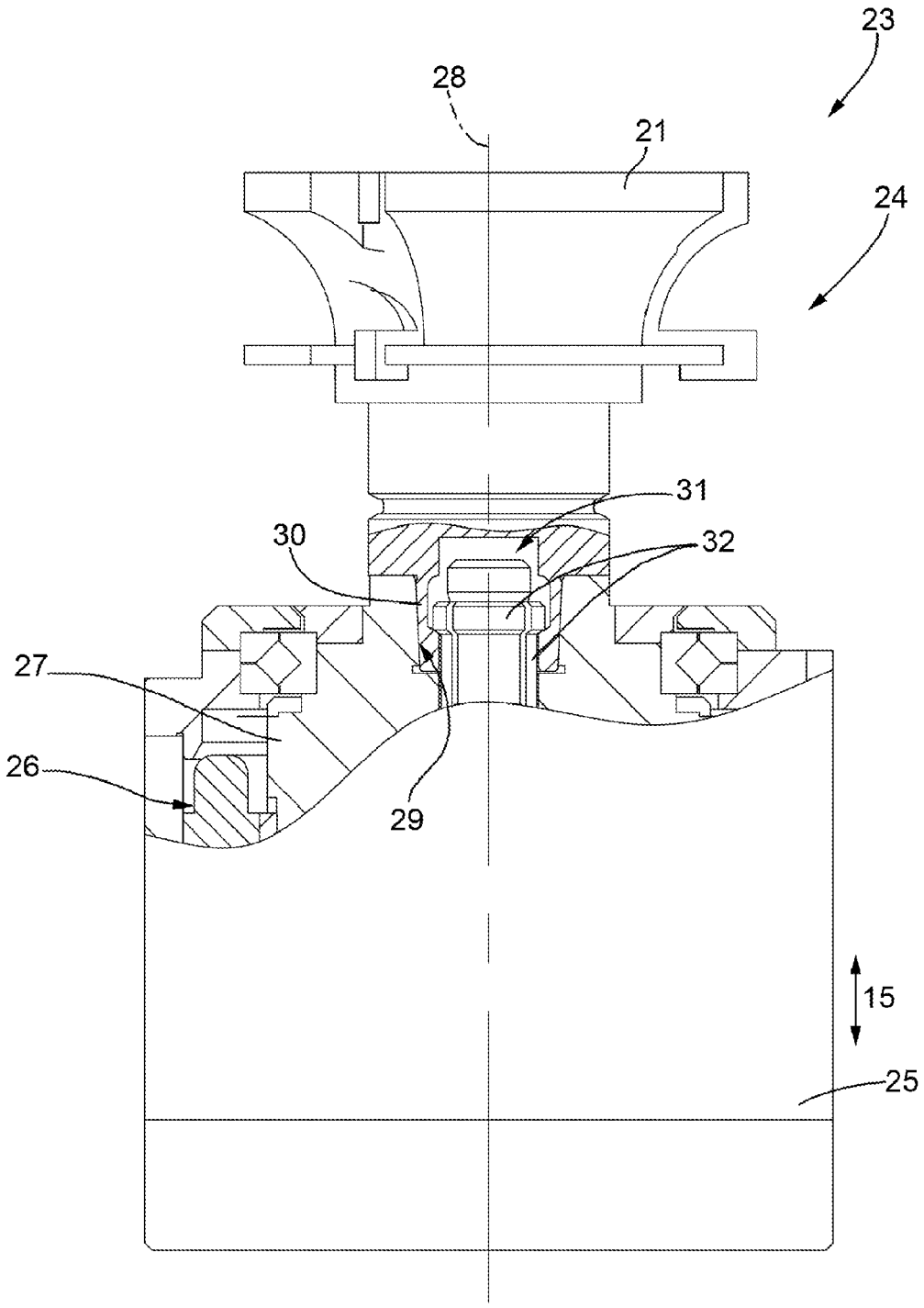

FIG.2

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EUROPEAN SEARCH REPORT

Application Number
EP 11 16 9029

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 35 42 506 A1 (KLOECKNER HUMBOLDT DEUTZ AG [DE]) 4 June 1987 (1987-06-04) * column 5, line 40 - line 44; claims 1,8; figures * -----	1-4	INV. B27M1/08 B27C9/02 B24B3/36
A	US 1 965 351 A (MUNROE TREADWAY B) 3 July 1934 (1934-07-03) * page 2, line 140 - line 146 * * page 5, line 5 - line 26; figure 4 * -----	1-4	
A	CN 2 038 836 U (CAI HONGXI [CN]) 7 June 1989 (1989-06-07) * figures * -----	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			B27M B27C B24B B23Q

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 August 2011	Huggins, Jonathan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 16 9029

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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24-08-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3542506 A1	04-06-1987	NONE	
US 1965351 A	03-07-1934	NONE	
CN 2038836 U	07-06-1989	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82