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(71) Applicant *(for all designated States except US)*: **TERMOZETA S.p.A.** [IT/IT]; Via Magenta, 41/43, I-20010 Bareggio (IT).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **BARDAZZI, Bruno** [IT/IT]; Località S. Giovanni in Petroio, I-50037 San Piero a Sieve (IT).

(74) Agents: **PORSIA, Attilio** et al.; Succ. Ing. Fischetti & Weber, Via Caffaro, 3/2, I-16124 Genova (IT).

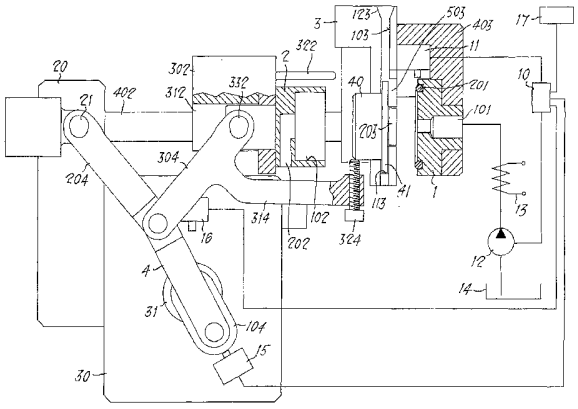
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** ESPRESSO COFFEE MACHINE



(57) **Abstract:** Espresso coffee machine comprising a hot-water dispensing unit (1) and filter holder means (2) able to house a pre-packaged cartridge (40, 50) of coffee powder, provided with means (202) for dispensing the coffee infusion; said filter holder means (2) and said dispensing unit (1) engage with each other in order to dispense the coffee and then separate following said dispensing operation along a trajectory lying in a plane substantially perpendicular to their middleengaging plane, there being envisaged guiding means (402) and actuating means (4, 104, 204, 304, 31, 30) provided with suitable control means (10,15,16), there being envisaged means (3) for supplying the pre-packaged cartridges (40;50) of coffee powder, situated between said dispensing unit (1) and said filter holder means (2) and arranged in a plane parallel to the plane of engagement and along the said trajectory, and means (203;303) for extracting said cartridge at the end of the coffee dispensing operation, also arranged in a plane parallel to the said engaging plane and along the said trajectory and situated between said dispensing unit (1) and said filter holder means (2), said supply means (3) being active along the section of said trajectory preceding said engagement, said extraction means (203; 303) being active along the section of said trajectory following said engagement.

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TITLE: "Espresso coffee machine"

DESCRIPTION

The present invention relates to espresso coffee machines and in particular relates to those machines where the coffee is introduced in the form of pre-filled cartridges, namely so-called "capsules" or the like, and even more particularly relates to coffee machines which have a completely automated operating cycle.

Espresso machines of the so-called "professional" type, in which a filter/filter-holder unit is on each occasion loaded with the coffee powder and engaged with the pressurised-water dispensing unit are considered by most users to be too difficult to use on a domestic level or for consumption in small communities; moreover, the filter/filter-holder unit must be washed with a certain frequency if it wished to maintain a high standard of quality of the infusion product. Another problem associated with this type of machine consists in the used coffee powder which must be removed and disposed of; the difficulty of removing the powdery residue and the stains produced by it is well-known.

For some time completely automatic coffee machines have been proposed where the powder, if not even the coffee beans, which are later ground inside the machine, are supplied to the infusion unit and then confined inside a special discharge container; these machines, however, have obvious structural complications which mean that they are somewhat delicate, costly and noisy. In addition to this, the parameters which must be regulated are numerous (degree of grinding of the coffee, quantity of coffee, degree of compression, quantity and temperature of the infusion water), and the production of

a good quality infusion becomes a more complex issue.

In order to simplify the use of the machines and increase the diffusion thereof, espresso coffee machines which use pre-filled cartridges of coffee powder, commonly called "capsules", have been developed. This type of solution avoids the problems associated with dosage of the coffee powder and improves the cleanliness of the machine and its ease of use; machines which used this type of supply system both with manual loading and automatic or semi-automatic loading are known. However, these machines have numerous drawbacks, in particular those machines equipped with automatic or semi-automatic loading systems; firstly, it is difficult to achieve effective sealing between the filter holder unit inside which the cartridge is inserted and the unit dispensing the infusion water. This seal is essential in order to obtain a good quality coffee and cannot be easily obtained when pre-filled cartridges are used.

Another major problem is associated with extraction of the cartridges from the espresso coffee machine, since in most cases this extraction occurs only at the start of a new preparation cycle, namely only when a new capsule is introduced into the machine. The presence of the used capsule inside the filter holder may result in deposition of the fine powders dispersed from the said capsule, which, together with the humidity and the oily substances present, may cause blockage of the dispensing means. Moreover, in the event of prolonged non-use, mould and fungi may develop inside the used capsule until they spread outside of it, with obvious danger for the user's health.

The object of the present invention is therefore to

provide an automatic espresso coffee machine which is able to overcome the abovementioned drawbacks, increasing the sealing capacity and allowing expulsion of the used capsule immediately after it has been used.

The present invention therefore relates to an espresso coffee machine comprising a tank for the water, a pump for delivery of said water to a boiler, a unit for dispensing the hot water, and filter holder means able to house a pre-packaged cartridge of coffee powder, provided with means for dispensing the coffee infusion; said filter holder means and said hot-water dispensing unit engage with each other in order to dispense the coffee infusion and then separate following said dispensing operation along a trajectory lying in a plane substantially perpendicular to their middle engaging plane, there being envisaged guiding means and actuating means provided with suitable control means; there are envisaged means for supplying the pre-packaged cartridges of coffee powder, situated between said dispensing unit and said filter holder means and arranged in a plane parallel to the plane of their mutual engagement and along the said trajectory, and means for extracting said pre-packaged cartridge at the end of dispensing of the coffee infusion, also arranged in a plane parallel to the said engaging plane and along the said trajectory and situated between said dispensing unit and said filter holder means, said supply means being active along the section of said trajectory preceding said engagement, said extraction means being active along the section of said trajectory following said engagement.

In a preferred embodiment, the actuating means are associated with said filter holder means, guided along the

direction perpendicular to the plane of engagement of said filter holder means with said dispensing unit and perform an alternating movement in the said direction, so as to displace said filter holder means towards and away from said hot-water dispensing unit.

Advantageously, these means may comprise a hinged lever mechanism joined to a connecting rod in turn connected to an electric motor having its axis perpendicular to the direction of movement of the said filter holder means.

Further advantages and characteristic features of the machine according to the present invention will emerge clearly from the following detailed description of some embodiments thereof, provided by way of a non-limiting example, with reference to the accompanying plates of drawings in which:

Figure 1 is a schematic diagram showing the espresso coffee machine according to the present invention, at the start of its operating cycle;

Figures 2 to 4 are views similar to that of Figure 1 and showing the subsequent stages of the operating cycle of the machine according to the invention;

Figures 5 to 7 are cross-sectional views of a detail of the machine according to Figure 1, during three different stages of the operating cycle;

Figures 8 to 11 are views, similar to those of Figures 5 to 7, of a variation of embodiment of the machine according to the present invention.

Figure 1 is a schematic diagram which shows the automatic espresso coffee machine according to the present invention; 1 denotes the hot-water dispensing unit supplied by the tank 14 via the pump 12, the heating means 13 being provided on the

supply line downstream of the said pump 12. Said dispensing unit 1 is provided with an axial dispensing duct 101 and with annular sealing means 201 arranged in the vicinity of its peripheral edge. The pump 12 is controlled by the control unit 10 which receives the requests for dispensing a coffee via the selection means 17 which may comprise a keypad, a knob-type selector or other suitable means.

The filter holder 2 is provided facing the hot-water dispensing unit 1 and movable in a direction perpendicular to the middle plane of engagement with this unit 1, said filter holder having an axial cavity 102 able to house a pre-packaged cartridge of coffee and being provided with a duct 202 for dispensing the coffee infusion. The filter holder 2 is integral with a slide 302 mounted slidably by means of sliding means 312 on a tubular guide 402 which at one end is connected to the support frame 20. The slide 302 is provided radially with a pin 332 which is joined to an arm 304 of the hinged lever mechanism 4, the other arm 204 of which is connected to the pin 21 of the support frame 20; the finger 322 also projects axially from the slide. The arm 304 has an angled branch 314 which at its free end is provided with a bolt 324; the lever mechanism 4 is also connected to the connecting rod 104 joined to the shaft 31 of the electric motor 30. Microswitches 15 and 16 are arranged on the side wall of the motor 30, so as to interfere with the movement of the connecting rod 104, and are connected to the control unit 10.

The device 3 supplying the pre-filled cartridges 40 is arranged between said unit 1 and said filter holder 2; said supply device has an axial guide channel 103 inside which the radial flange 41 projecting from the cartridge 40 is

introduced. The cartridge 40 shown here has a substantially cylindrical shape, with the flange 41 projecting radially at one of the ends of said cartridge. The channel has a flared portion 123 at its inlet end and a step 113 against which the flange 41 of the cartridge 40 bears; the said cartridge is furthermore supported by the bolt 324 projecting from the branch 314 of the arm 304 of the lever mechanism 4. The movable extraction elements 203, which will be described more fully below, are arranged in the region of the opening 303 of the supply device directed towards the unit 1. The bracket 403 connects the supply device 3 to the unit 1, and the microswitch 11 is arranged on the said bracket; the microswitch 11 is connected to the control unit 10.

With reference to Figures 1 to 4, the operating principle of the machine according to the invention will be evident from the description below. The machine in Figure 1 is shown at the start of its operating cycle; a cartridge 40 has been introduced inside the guide 103 of the supply device 3 and is waiting to be picked up by the filter holder 2, being furthermore supported by the bolt 324 situated on the branch 314 of the arm 304; the request for preparation of a coffee, which is formulated via the selection means 17 connected to the control unit 10, starts the procedure. The control unit 10 sends a signal to the motor 30 which causes rotation, via its shaft 31, of the connecting rod 104; the slide 302 advances towards the supply device 3 and the filter holder 2 moves integrally with the said slide (see Figure 2) and the cartridge is positioned inside the cavity 102 of the said filter holder 2. The branch 314 of the arm 304 and its cartridge support bolt 324, which has completed its function,

move away.

During the following step, shown in Figure 3, the filter holder 2 passes beyond the position of the supply device 3 and engages with the hot-water dispensing unit 1. The two arms 204 and 304 of the lever mechanism 4 are now in their fully extended position and in this way they ensure extremely effective sealing upon engagement between the unit 1 and the filter holder 2. The connecting rod 104 has come into contact with the microswitch 16 and this has resulted in stoppage of the motor 30. In the meantime, the finger 322 projecting axially from the slide 302 has come into contact with the microswitch 11, the function of which is that of allowing operation of the pump 12 which is therefore able to start dispensing of the coffee infusion; said dispensing operation will be regulated in accordance with a predetermined quantity of water which, if necessary, is regulated beforehand or programmable in each case by the user.

At the end of dispensing, as shown in Figure 4, the control unit starts up the motor 30 again and the further rotation of the shaft 31 causes the movement of the filter holder 2 away from the unit 1; during its return travel path through the supply device 3, the flange of the cartridge encounters the extractors 203 and is therefore removed from the axial cavity 102 of the filter holder 2; when the connecting rod 104 encounters the microswitch 15, the motor stops again and the operating cycle will be completed.

Figure 5 shows the structure of the guide 103 in the region of the hot-water dispensing unit 1; the same reference numbers have been used to denote similar parts. The extractors 203 are inserted in a radially movable manner with

respect to the said cartridge 40 inside cavities 133 formed inside the supply device 3; they have, directed towards the guide 103, inclined walls 213 and are provided at the opposite end with resilient recall means, namely springs 223. When, as shown in Figure 6, the filter holder 2 pushes the cartridge 40 towards the unit 1, the flange 41 slides on the inclined walls 213 of the extractors 203 and these expand, allowing it to pass through. When, however, the filter holder 2 moves away from the unit 1, as shown in Figure 7, the flange 41 encounters the opposition of the extractors 203 which have returned into position as a result of the springs 223 and which therefore extract it from the cavity 102 of the filter holder 2, thus allowing removal thereof.

Figure 8 shows an alternative embodiment of the machine according to the present invention, in which same numbers have been used to denote similar parts. In this case, the machine is supplied with cartridges 50 which have a substantially elliptical shape, with the flange 51 projecting radially along the equatorial plane of said cartridge. The axial cavity 502 of the filter holder 2 is formed correspondingly, and also the hot-water dispensing unit 1 has an axial cavity 501 suitable for receiving the cartridge 50. The unit 1 is also provided axially with a pusher 401 housed inside a recess 421 and provided with a resilient helical recall spring 411; the hot-water dispensing duct 301 is arranged in annular fashion around the recess 421 which houses said pusher 401. The extractors 303 are in this embodiment fixed reliefs projecting radially with respect to the cartridge 50. As can be seen from Figure 9, the flange 51 of the cartridge 50 has dimensions and a resilience which allow it to flex under the

thrust of the filter holder 2, so as to overcome the extractors 303; the presence of the pusher 401, which projects well beyond the cavity 501 of the unit 1 ensures guiding during positioning of the cartridge which is therefore situated in the position shown in Figure 10, ready for dispensing the coffee infusion. When the filter holder 2 moves away from the unit 1, the pusher 401, under the action of the spring 411, causes the cartridge 50 to come out of the cavity 501 of the unit 1; subsequently the flange 51 of the cartridge 50 meets with the resistance of the extractors 303 and, in this case, in the absence of thrust, there being no longer any thrust from the pusher 401, it is unable to overcome them and the cartridge 50 is therefore expelled.

The machine according to the present invention, on the one hand, ensures extremely effective sealed engagement of the filter holder means with the hot-water dispensing unit and, on the other hand, allows direct elimination of the used cartridge at the end of dispensing, using a system which is extremely simple both from the operational and from the constructional point of view and which in particular is not dependent upon an immediate further request for production made to the machine.

CLAIMS

1. Espresso coffee machine comprising a tank for the water (14), a pump (12) for delivery of said water to a boiler (13), a hot-water dispensing unit (1) and filter holder means (2) able to house a pre-packaged cartridge (40, 50) of coffee powder, provided with means (202) for delivering the coffee infusion, characterized in that said filter holder means (2) and said hot-water dispensing unit (1) engage with each other in order to dispense the coffee infusion and then separate following said dispensing operation along a trajectory lying in a plane substantially perpendicular to their middle engaging plane, there being envisaged guiding means (402) and actuating means (4, 104, 204, 304, 31, 30) provided with suitable control means (10, 15, 16), there being envisaged means (3) for supplying the pre-packaged cartridges (40; 50) of coffee powder, situated between said dispensing unit (1) and said filter holder means (2) and arranged in a plane parallel to the plane of their mutual engagement and along the said trajectory, and means (203; 303) for extracting said pre-packaged cartridge at the end of dispensing of the coffee infusion, also arranged in a plane parallel to the said engaging plane and along the said trajectory and situated between said dispensing unit (1) and said filter holder means (2), said supply means (3) being active along the section of said trajectory preceding said engagement, said extraction means (203; 303) being active along the section of said trajectory following said engagement.

2. Espresso coffee machine according to Claim 1, in which said actuating means (4, 104, 204, 304, 31, 30) are associated with said filter holder means (2) which are

movable, suitably guided, in the direction perpendicular to the plane of engagement of said filter holder means (2) with said dispensing unit (1).

3. Machine according to Claim 2, in which the actuating means comprise a hinged lever mechanism (4, 204, 304) joined to a connecting rod (104) in turn connected to the shaft (31) of an electric motor (30), the axis of which is perpendicular to the direction of movement of the said filter holder means (2), an arm (304) of said lever mechanism (4) being connected to said filter holder means (2).

4. Machine according to any one of Claims 1 to 3, in which said control means (10, 15, 16), following a request for dispensing coffee infusion performed via suitable selection means (17), operate as follows: activation of the actuating means (4, 104, 204, 304, 31, 30); stoppage of the actuating means following engagement of the filter holder means (2) and the hot-water dispensing unit (1) and subsequent dispensing of the coffee infusion; renewed activation of the actuating means (4, 104, 204, 304, 31, 30), at the end of dispensing of the infusion, in order to move away the filter holder means (2) and the dispensing unit (1), and subsequent stoppage thereof in a position awaiting a further dispensing request.

5. Machine according to Claim 4, in which said control means comprise furthermore consent means (11) for controlling operation of the water delivery pump (12), said consent means being activated upon engagement of said hot-water dispensing unit (1) with said filter holder means (2).

6. Machine according to Claim 3 and Claim 4 or 5, in which said control means comprise two microswitches (15, 16) which are arranged so as to interfere with the movement of

said connecting rod (104) in the position (16) where the filter holder means (2) engage with the hot-water dispensing unit (1) and the position (15) awaiting a dispensing request.

7. Machine according to any one of the preceding Claims 1 to 5, in which said supply means comprise a supply device (3) provided with a guide channel (103) co-operating with said pre-packaged cartridge (40; 50) of coffee, said cartridge being formed substantially with circular symmetry and provided on its side wall with a radially projecting flange (41; 51).

8. Machine according to any one of the preceding Claims 1 to 6, in which said extraction means comprise tooth-like reliefs (203; 303) arranged radially with respect to said cartridge and able to interfere with the flange (41; 51) projecting radially from said cartridge (40; 50) during its movement along the section of said trajectory following said engagement.

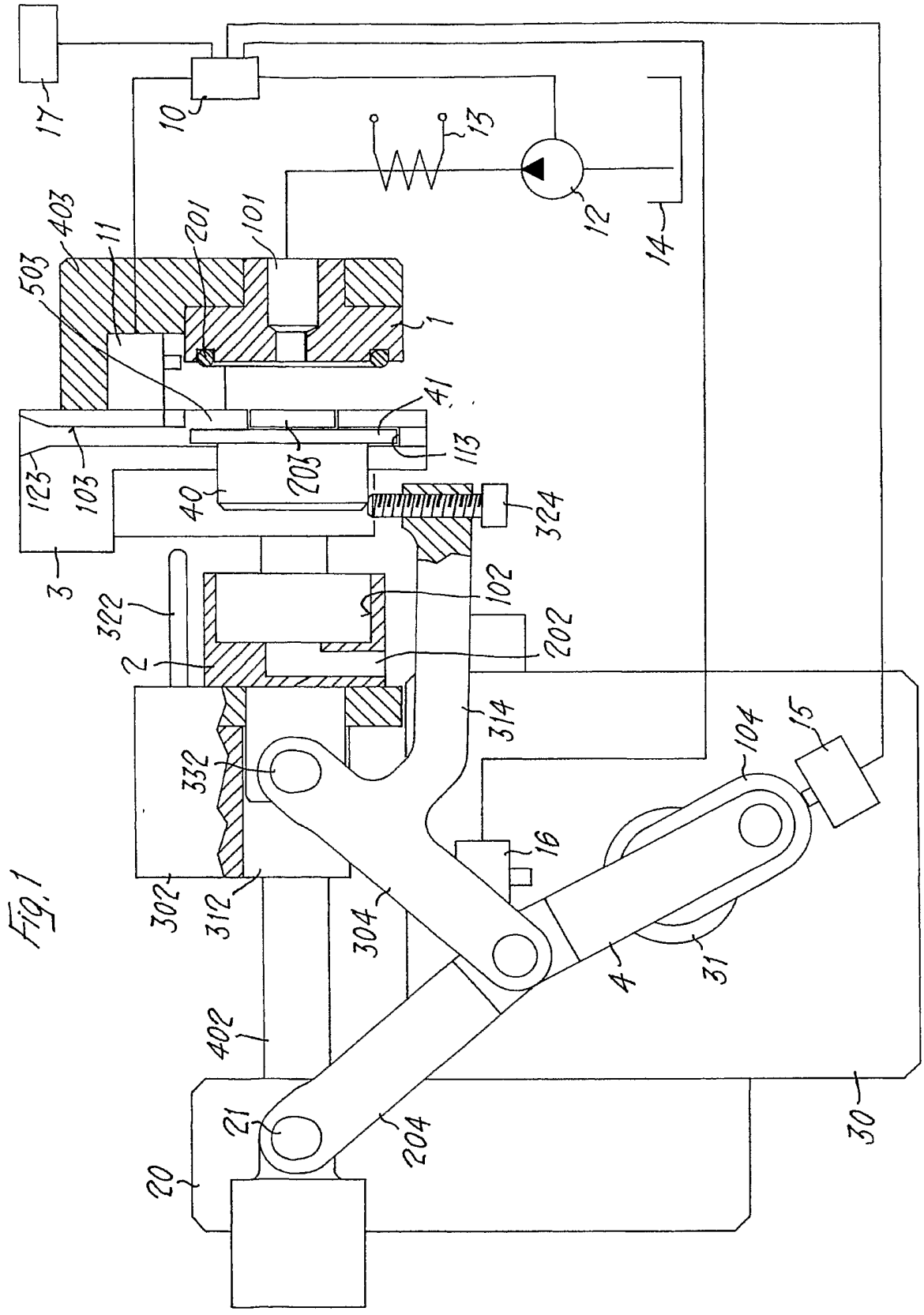

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Fig. 1

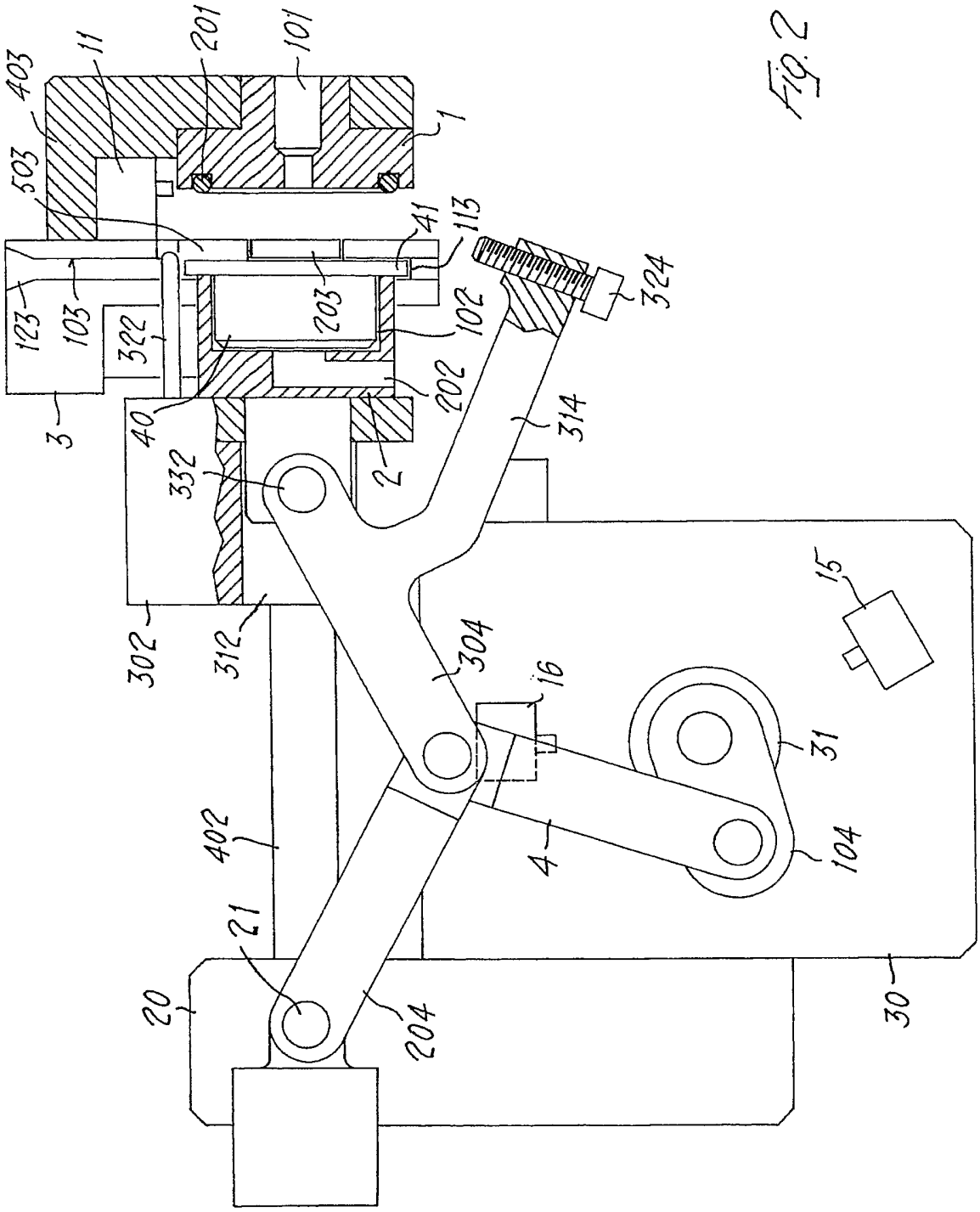

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Fig. 2

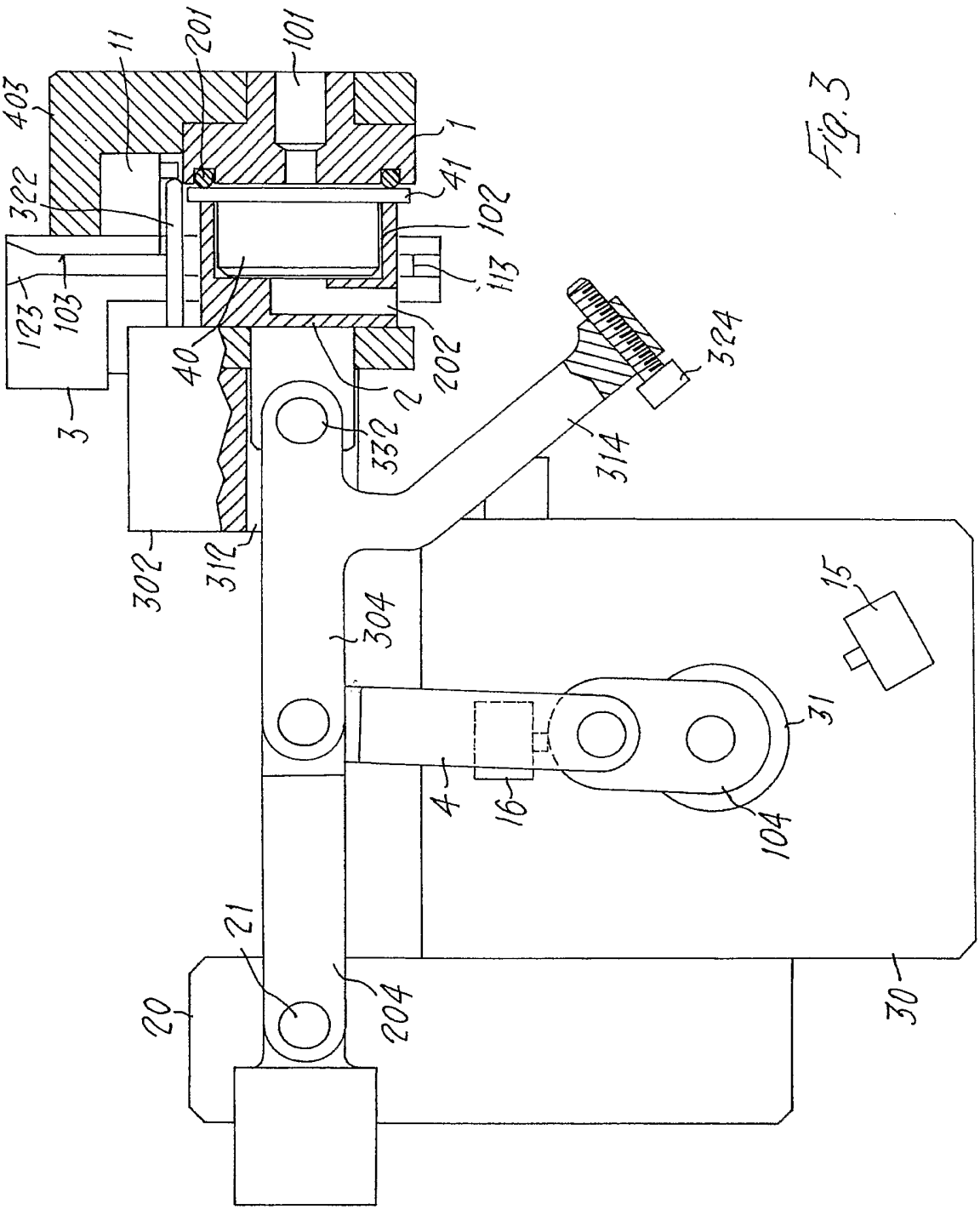

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Fig. 3

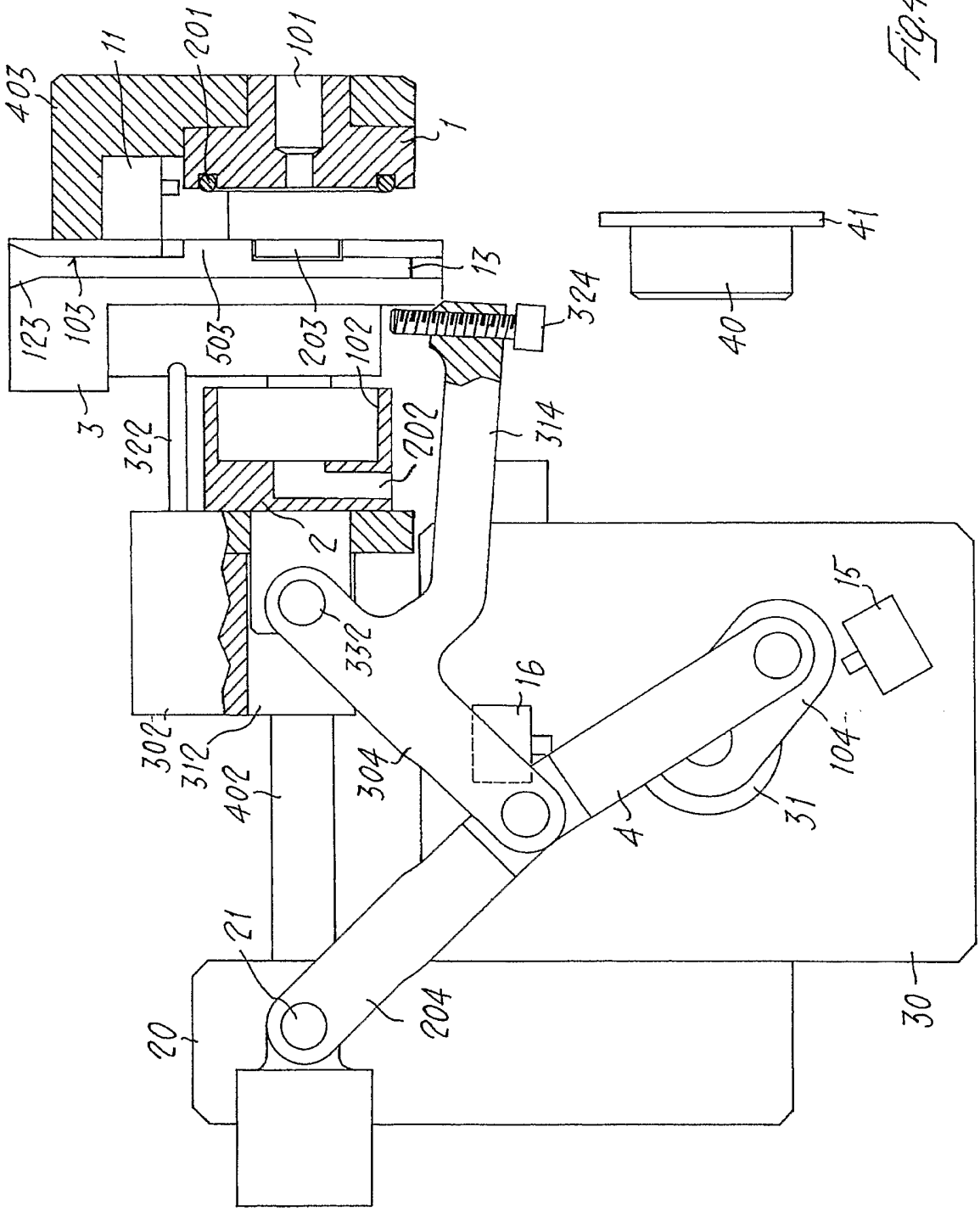

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Fig.4

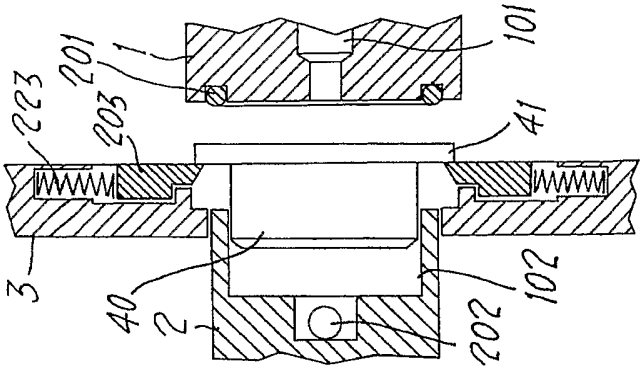


Fig. 7

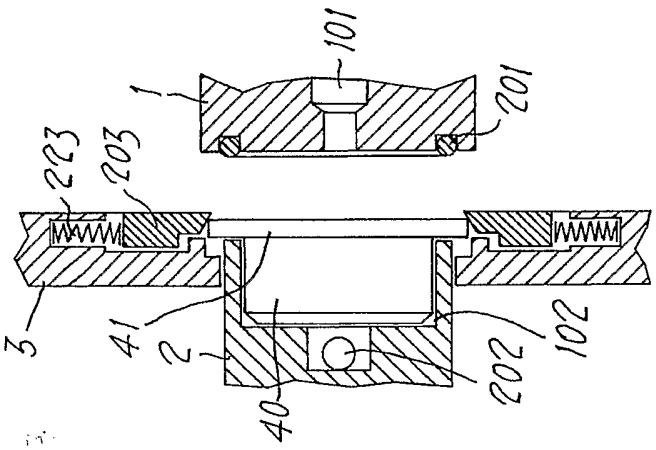


Fig. 6

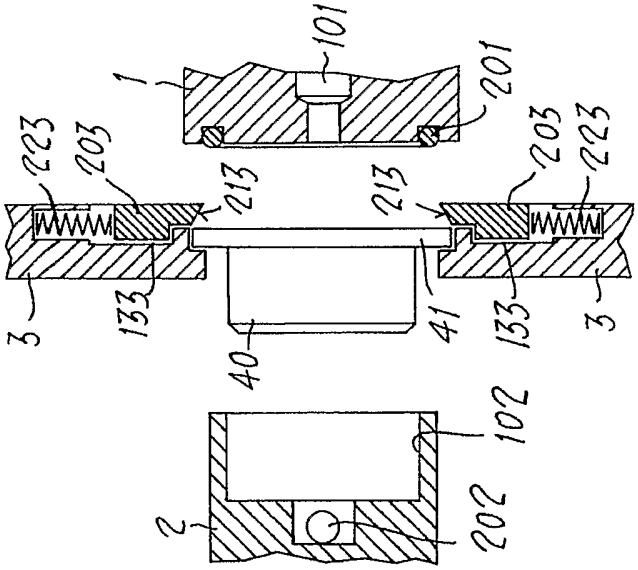


Fig. 5

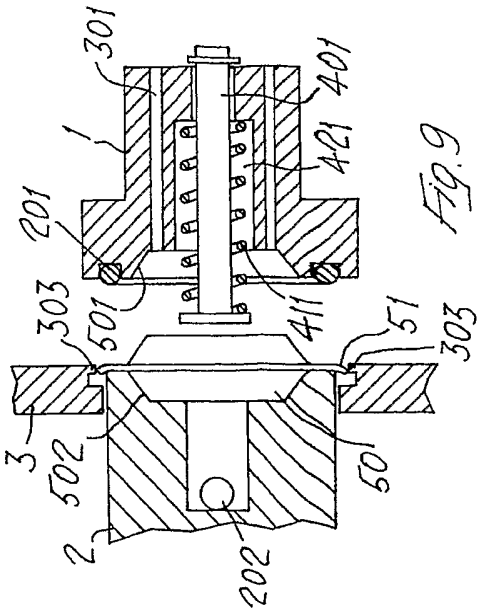


Fig. 9

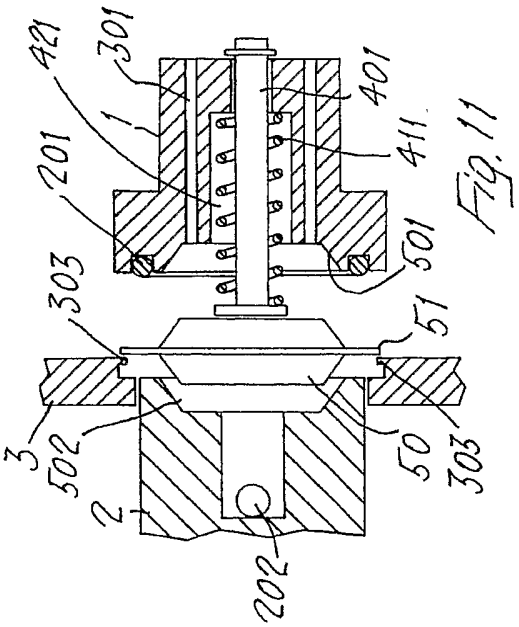


Fig. 11

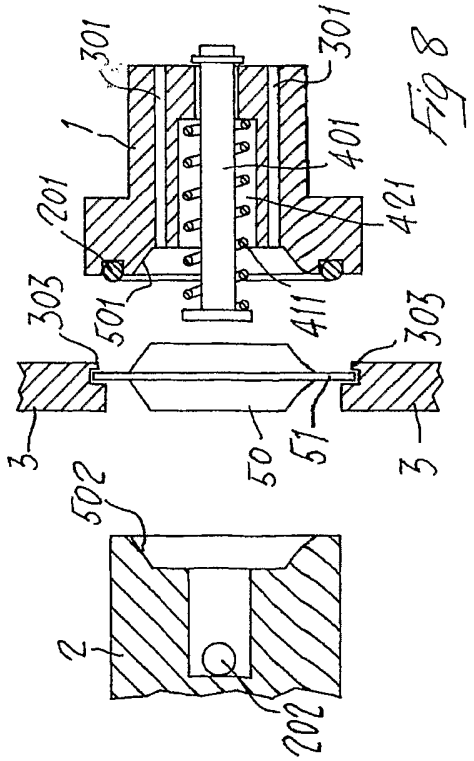


Fig 8

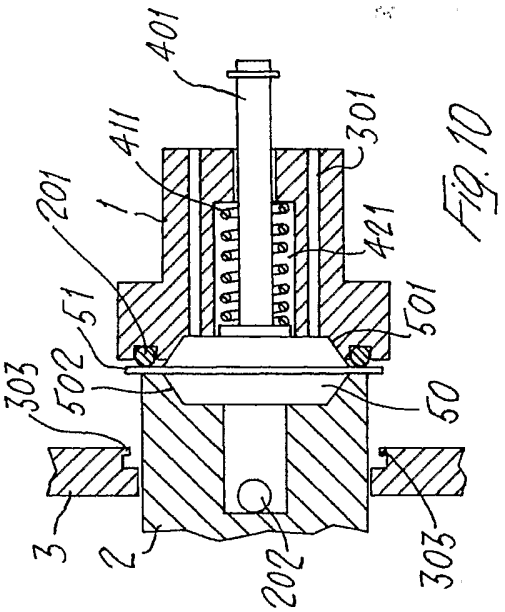


Fig. 10

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/053119

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47J31/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 755 149 A (BLANC ET AL) 26 May 1998 (1998-05-26) column 5, line 35 - column 11, line 25; figures 1-5,10,13-17	1-8
X	US 5 776 527 A (BLANC ET AL) 7 July 1998 (1998-07-07) column 4, line 31 - column 5, line 36; figures 3-6	1,2,4,5, 7,8
X	WO 98/47418 A (COMPAGNIE MEDITERRANEENNE DES CAFES S.A; BLANC, JEAN, PIERRE; FERRIER,) 29 October 1998 (1998-10-29) page 5, line 3 - page 9, line 5; figures	1
A	US 6 505 544 B1 (BLANC JEAN-PIERRE ET AL) 14 January 2003 (2003-01-14) column 3, line 56 - column 7, line 62; figures	1-8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
3 March 2005	23/03/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	De Terlizzi, M

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP2004/053119

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5755149 A	26-05-1998	FR 2713905 A1	23-06-1995
		FR 2723524 A1	16-02-1996
		AT 253859 T	15-11-2003
		AU 699759 B2	17-12-1998
		AU 1274995 A	10-07-1995
		BR 9408356 A	26-08-1997
		CA 2178595 A1	29-06-1995
		CN 1137742 A ,C	11-12-1996
		CZ 9601583 A3	14-05-1997
		DE 69433324 D1	18-12-2003
		DE 69433324 T2	16-09-2004
		DK 735837 T3	08-03-2004
		EP 0735837 A1	09-10-1996
		ES 2210279 T3	01-07-2004
		WO 9517121 A1	29-06-1995
		HU 74813 A2	28-02-1997
		JP 9506799 T	08-07-1997
		OA 10301 A	07-10-1997
		PL 315120 A1	14-10-1996
		PT 735837 T	30-04-2004
		RO 115013 B1	29-10-1999
		RU 2129830 C1	10-05-1999
US 5776527 A	07-07-1998	FR 2709737 A1	17-03-1995
		FR 2709655 A1	17-03-1995
		AT 160267 T	15-12-1997
		AU 683084 B2	30-10-1997
		AU 7617894 A	27-03-1995
		BR 9407388 A	29-10-1996
		CA 2170257 A1	16-03-1995
		CN 1130345 A ,C	04-09-1996
		CZ 9600490 A3	14-08-1996
		DE 69406939 D1	02-01-1998
		DE 69406939 T2	18-06-1998
		DK 717603 T3	27-07-1998
		EP 0717603 A1	26-06-1996
		ES 2112560 T3	01-04-1998
		WO 9507041 A1	16-03-1995
		GR 3026081 T3	29-05-1998
		HU 74240 A2	28-11-1996
		IL 110849 A	20-11-1997
		JP 3579769 B2	20-10-2004
		JP 9502115 T	04-03-1997
		MA 23322 A1	01-04-1995
		OA 10268 A	07-10-1997
		PL 313287 A1	24-06-1996
		RO 115841 B1	28-07-2000
		RU 2141214 C1	20-11-1999
		TR 28819 A	03-04-1997
		ZA 9406753 A	28-03-1995
WO 9847418 A	29-10-1998	WO 9847418 A1	29-10-1998
		AU 2704397 A	13-11-1998
US 6505544 B1	14-01-2003	FR 2788955 A1	04-08-2000
		AT 234586 T	15-04-2003
		AU 3058700 A	18-08-2000
		CN 1120687 C	10-09-2003

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP2004/053119

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6505544 B1		DE 60001716 D1	24-04-2003
		DE 60001716 T2	15-01-2004
		EP 1146807 A1	24-10-2001
		ES 2194697 T3	01-12-2003
		WO 0044268 A1	03-08-2000
		PT 1146807 T	31-07-2003