

(19) World Intellectual Property  
Organization  
International Bureau



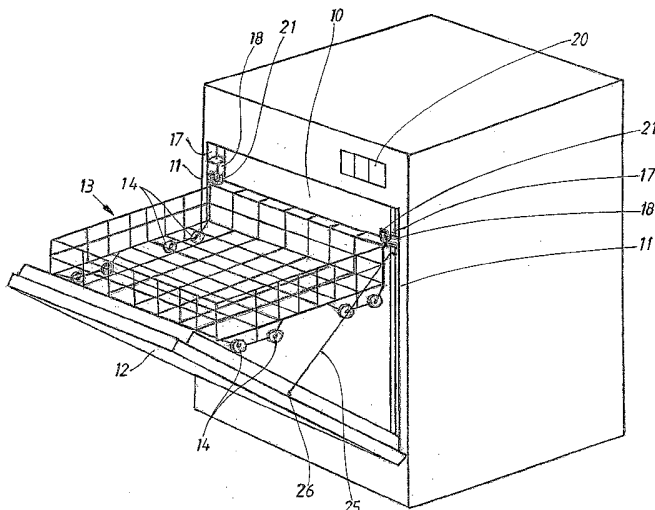
(43) International Publication Date  
10 November 2005 (10.11.2005)

PCT

(10) International Publication Number  
**WO 2005/104924 A1**

- (51) International Patent Classification<sup>7</sup>: **A47L 15/50**
- (21) International Application Number:  
PCT/SE2005/000515
- (22) International Filing Date: 7 April 2005 (07.04.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0401122-7 29 April 2004 (29.04.2004) SE
- (71) Applicant (for all designated States except US): **ELECTROLUX HOME PRODUCTS CORPORATION N.V.** [BE/BE]; Belgicastraat 17, B-1930 Zaventem (BE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **DELLBY, Fredrik** [SE/SE]; Johan Skyttes väg 226, S-125 34 Älvsjö (SE). **BERGLING, Fredrik** [SE/SE]; Brytarvägen 21, S-184 75 Åkerberga (SE). **PEAKE, Gregory** [AU/AU]; 14 Bruce Street, Kingsford, NSW 2032 (AU).
- (74) Agent: **SVAHN, Göran**; AB Electrolux, Group Intellectual Property, S-105 45 Stockholm (SE).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**  
— with international search report
- 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: BASKET LIFTING ARRANGEMENT FOR A DISHWASHER



(57) Abstract: This invention relates to a dishwasher comprising a wash cabinet (10) having a bottom, two opposite side walls (11), an upper and a rear wall and an opening that normally is covered by a front door (12). The dishwasher is provided with at least one lower basket (13) for the dish being cleaned, said basket being movable between a first position inside the cabinet and a second position mainly outside the cabinet. The dishwasher is at each side of the opening provided with a support (21) arranged to move mainly vertically in or close to the side walls (11) for raising the lower basket (13) from a lower to an upper position and vice versa. The supports (21) are under the influence of a lifting means (18) arranged to move the supports from an inactive position out of engagement with the lower basket (13) to an active position in which they are in engagement with the lower basket.

WO 2005/104924 A1

### **Basket lifting arrangement for a dishwasher**

5           This invention relates to a dishwasher comprising a wash cabinet having a bottom, two opposite side walls, an upper and a rear wall and an opening that normally is covered by a front door the dishwasher being provided with at least one lower basket for the dish being cleaned, said basket being movable between a first position inside the cabinet and a second position mainly outside the cabinet, the dishwasher at each side of  
10 the opening being provided with a support arranged to move mainly vertically in or close to the side walls for raising the lower basket from a lower to an upper position and vice versa

          Household dishwashers of the floor standing type having means for lifting the lower basket in order to make it easier to load or unload the basket are previously  
15 known in the art. The major part of such known devices are provided with torque link arrangements, see for instance US 5115822, arrangements for lifting the door together with the basket, see US 6510858, or manually operated swing arm systems, see JP 10-179495. These arrangements have however proved to be unsatisfactory with regard to stability and safety and moreover the arrangements are rather complicated and hence  
20 expensive. It is also previously known to provide a dishwasher with a height adjustment mechanism for an intermediate basket that is placed between a lower and an upper basket, see US 2003/0042825. This mechanism is provided with means at each side for supporting the guide rails on which the basket rests. The arrangement is primarily intended for adjusting the space above or below the intermediate basket in order to  
25 make it possible to wash details having different sizes and the arrangement has a limited vertical movement possibility.

          The purpose of this invention is to create an ergonomic lifting arrangement for a lower dishwasher basket making it possible for the operator to easily pick out the dish from the basket without the need for bending his back. An additional purpose is to  
30 create an arrangement that is stable and safe to use as well as simple and reliable. This is achieved by means of an arrangement having the characteristics mentioned in the claims.

          An embodiment of the invention will now be described with reference to the accompanying drawings on which Fig. 1 schematically shows a perspective view of a

dishwasher with the lower basket in a lower position, Fig. 2 is a perspective view of the dishwasher with the lower basket in a lifted up position whereas Fig. 3 is a partly broken perspective view showing a part of the lifting mechanism in two different positions.

5 As appears from Fig. 1 the dishwasher comprises a wash cabinet 10 provided with a bottom, two side walls 11, an upper and a rear wall and an opening that normally is covered by a front door 12. An upper and a lower basket 13 (upper basket not shown) are provided in the cabinet and the baskets can be pulled out from their position within the cabinet to a position outside the cabinet. The dishwasher is in a conventional way  
10 also provided with rotating wash arms, filter means, a circulation pump, an outlet pump and mechanical and electrical control means for distributing cleaning liquid into the cabinet as well as to circulate the liquid in the cabinet in order to clean the dish which is placed on the baskets before the liquid is emptied from the cabinet. The lastmentioned means are however not shown and described in detail since they are not a part of the  
15 present invention.

The lower basket 13 which is provided with several rolls 14 can be pulled out from the cabinet 10 by the operator such that the wheels are guided in elongated recesses 15 arranged on the inner side of the door 12 when the door is in a folded down, mainly horizontal position. The lower basket 13 is at its innermost end and at each side  
20 provided with a U-shaped catch portion 16 the purpose of which will be explained below.

Each side walls 11 is at its front part provided with a C-shaped rail 17 extending almost from the bottom of the cabinet to its top and in which a slider 18 is guided for vertical motion. The slider can be raised and lowered by means of a wire 19 that via  
25 pulleys (not shown) mounted in the side walls are connected to a an electric motor (not shown) that can be activated by a control means 20. At each end of at least one of the rails 17 there is a switch (not shown) stopping the upwards or downwards movement of the slider 18. The slider 18 is at its front side provided with a support such as spring loaded arm 21 that can be turned about an axis 22 and having a hook 23. The arm can  
30 be turned from an upright position, see the lower part of Fig. 3, in which it the arm rests against a forwardly extending flange portion 24 of the rail 17 to a folded out position, see the upper part of Fig. 3, in which the arm rests against a shoulder 25 of the slider 18.

The dishwasher is further provided with two wires 25 each having one end secured to one of the sliders 18 whereas the other end is secured to a spring (not

shown) arranged within the door 12. The wires 25 run freely through an aperture 26 at the side edges of the door 12 and are under the influence of the spring but the pull out motion of the wires from the door is restricted by a separate stop member (not shown), secured to the wire inside the door, or the spring and engaging the door wall when the  
5 wires have been pulled out to their end positions.

The arrangement operates in the following manner. When picking out the dish from the lower basket the operator pulls out the lower basket 13 from the cabinet 10 and the rolls 14 are thus running in the elongated recesses 15 on the door 12. Then the operator pushes the control means 20 such that the electric motor of the winding  
10 arrangement is started which means that the wires 19 simultaneously lift the sliders 18 from their lower position illustrated in the bottom of Fig. 3 to a somewhat raised position shown in the upper part of the same figure. Because of the spring forces acting on the arms 21 and the successive rising motion above the upper end of the flanges 24 the arms gradually are turned and finally reach their folded out positions in which the  
15 arms rest on the shoulders 27 of the sliders 18. Further rising motion of the slides 18 means that the hooks 23 arranged on the arms 21 move into the catch portions 16 of the basket 13 and start to lift the inner end of the basket.

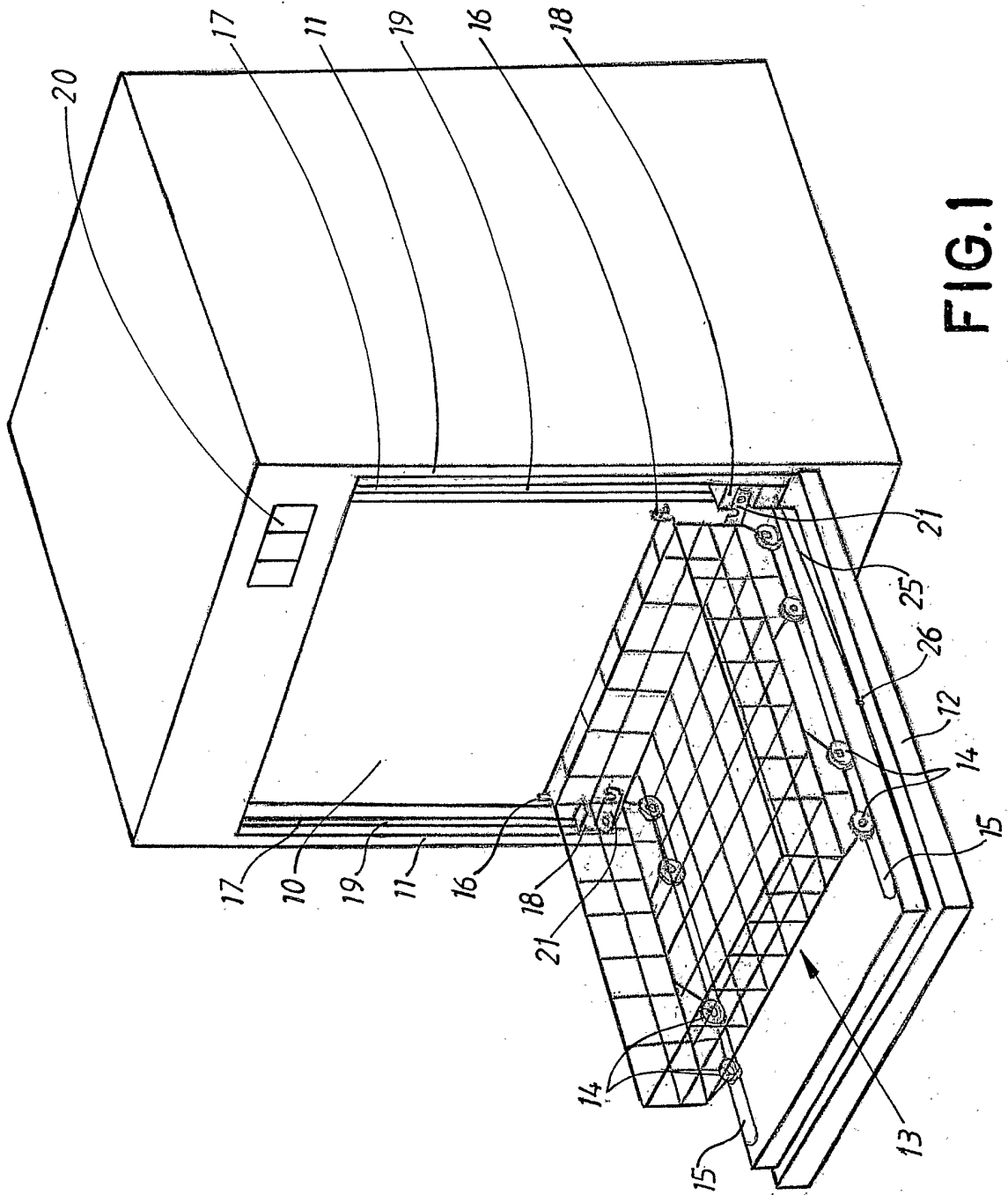
Simultaneously the wires 25 are gradually pulled out from the door 12 through the aperture depending on the wire interconnection with the sliders 18 until the stop  
20 member on the wire engages the inside wall of the door. Then the door starts to turn upwards at the same time as the front rollers 14 start to roll upwards in the recesses 15. Thus, continued raising of the sliders 18 means that the basket is gradually lifted. When the sliders reach the upper position of the rails the switches will stop the electric motor and hence the basket will now be in a lifted up position such that it is easy to pick out  
25 the dish. Lowering the basket will take place in the reverse order after activating the control means 20.

Instead of supporting the basket at the front side by the door and at the rear side by the support arms it is also possible to use solely one support arm at each side of the basket. These support arms could for instance be hidden in the side walls of the  
30 dishwasher when not being activated and be folded out when being activated such that they come into engagement with the basket and lift the basket to an upper position.

## Claims

1. Dishwasher comprising a wash cabinet (10) having a bottom, two opposite side walls (11), an upper and a rear wall and an opening that normally is covered by a front door (12) the dishwasher being provided with at least one lower basket (13) for the dish being cleaned, said basket being movable between a first position inside the cabinet and a second position mainly outside the cabinet, the dishwasher at each side of the opening being provided with a support (21) arranged to move mainly vertically in or close to the side walls (11) for raising the lower basket (13) from a lower to an upper position and vice versa **characterized in** that that the supports (21) are under the influence of a lifting means (18) arranged to move the supports from an inactive position out of engagement with the lower basket (13) to an active position in which they are in engagement with the lower basket.
2. Dishwasher according to claim 1 **characterized in** that said support (21) is a turnable or extendable arm.
3. Dishwasher according to claim 1 or 2 **characterized in** that said lifting means (18) is activated by an electric motor connected to a control means (20).
4. Dishwasher according to claim 3 **characterized in** that said electric motor via a wire system (19) is connected to the lifting means (18).
5. Dishwasher according to any of the previous claims **characterized in** that the lifting means (18) comprises a slider that is guided mainly vertically by a rail (17).
6. Dishwasher according to any of the previous claims **characterized in** that the dishwasher further includes a door turning mechanism synchronizing the raising motion of the supports with the door turning motion such that the basket is supported by said supports (21) as well as the door (12).
7. Dishwasher according to claim 6 **characterized in** that the door is connected to the lifting means via a mechanical connection.
8. Dishwasher according to claim 8 **characterized in** that said mechanical connection is a wire (25).
9. Dishwasher according to claim 8 **characterized in** that the door is provided with an aperture (26) through which the wire (25) runs into the door and that the end of the wire in the door is connected to a spring.

10. Dishwasher according to claim 2 **characterized in** that the arm (21) is spring loaded and cooperates with a flange (24) or the like that turns the arm from a horizontal to a vertical position when the lifting means (18) reaches its lower position.



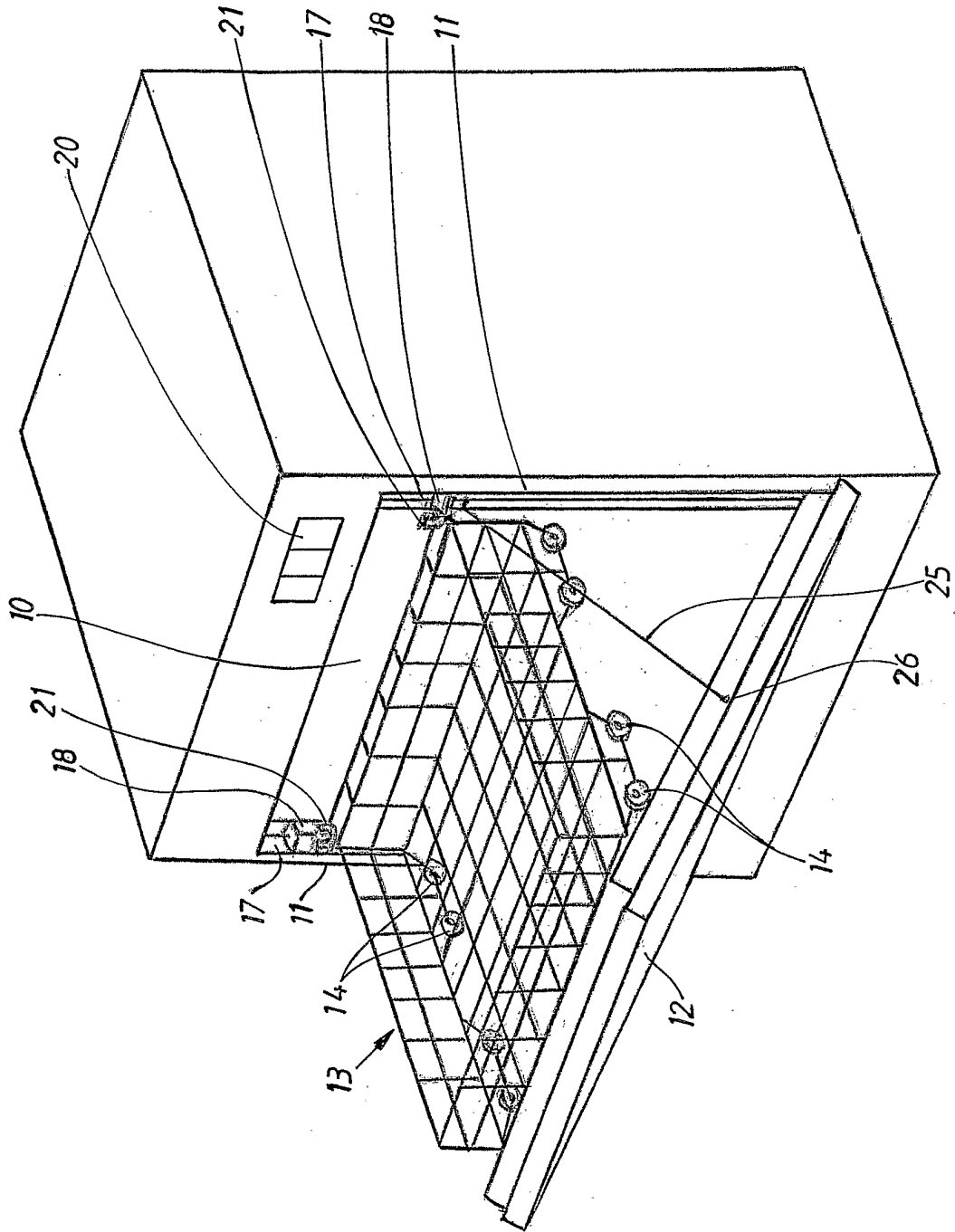
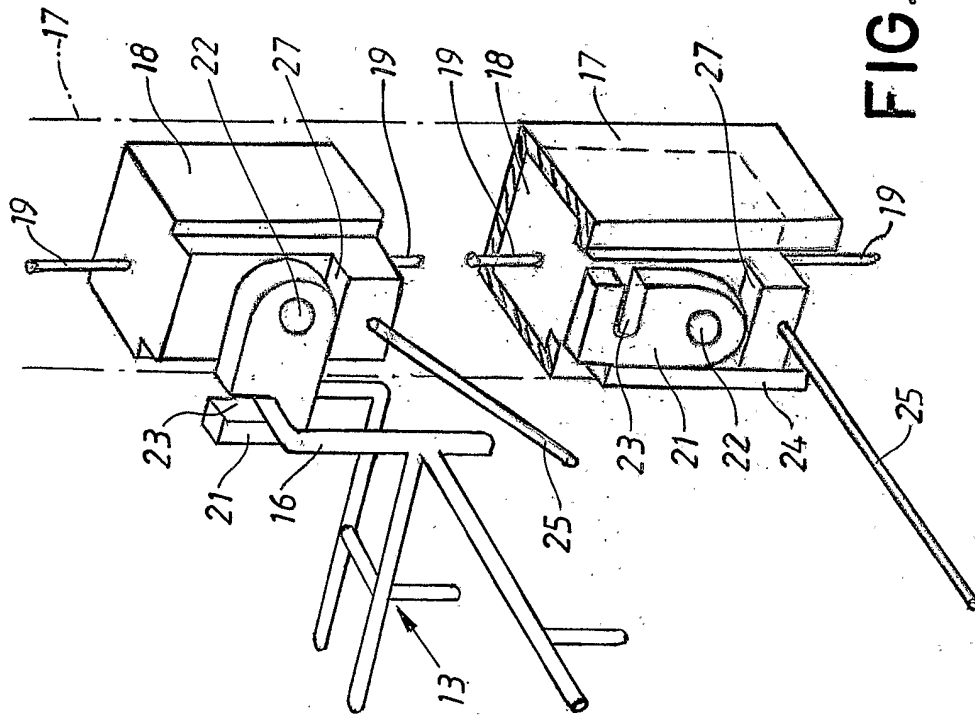


FIG. 2



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2005/000515

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A47L 15/50

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)

IPC7: A47L

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

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, 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.
A	US 6247771 B1 (E.J. MILLER), 19 June 2001 (19.06.2001), abstract, figures --	1-10
A	US 5115822 A (W.E. NICHOLS), 26 May 1992 (26.05.1992), abstract, figures --	1-10
A	US 5971513 A (A.B. CASSALIA), 26 October 1999 (26.10.1999), abstract, figures -- -----	1-10

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

2 June 2005

Date of mailing of the international search report

27-06-2005

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Anna Rapp / MRo  
Telephone No. +46 8 782 25 00

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/SE 2005/000515

US	6247771	B1	19/06/2001	NONE
US	5115822	A	26/05/1992	NONE
US	5971513	A	26/10/1999	NONE