(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 464 269 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.10.2004 Bulletin 2004/41

(51) Int Cl.[7]: **A47L 15/50**

(21) Application number: **03425206.4**

(22) Date of filing: **03.04.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(71) Applicant: **Bonferraro S.p.A.**
37060 Bonferraro (VR) (IT)

(72) Inventors:
- **Gobbi, Ezio**
  46037 Roncoferraro MN (IT)
- **Piazza, Damiano**
  46033 Casteldario MN (IT)

(74) Representative: **Concone, Emanuele et al**
Società Italiana Brevetti S.p.A.
Via Carducci 8
20123 Milano (IT)

(54) Dishwasher basket

(57) A dishwasher basket with a conventional metallic wire structure (C) includes a front drop-tray (D) extending below the front portion of the basket and mobile between a substantially vertical position when it is introduced into the dishwasher and a substantially horizontal position when it is pulled out of the dishwasher, the automatic movement between the two positions being provided by a longitudinal rod (R) pivoted on the drop-tray (D) and slidably mounted on suitable supports (H) secured to the basket structure (C), as well as by a return spring (S) secured between the structure (C) and the drop-tray (D) or said rod (R). In this way the basket can be pulled out even beyond the top edge of the door, to have the greatest ease of loading yet without risks of floor soiling or of creating dirt build-up areas on the door internal surface, and the automatic movement of the drop-tray (D) guarantees that in the washing phase it will not be an obstacle to the washing jets.

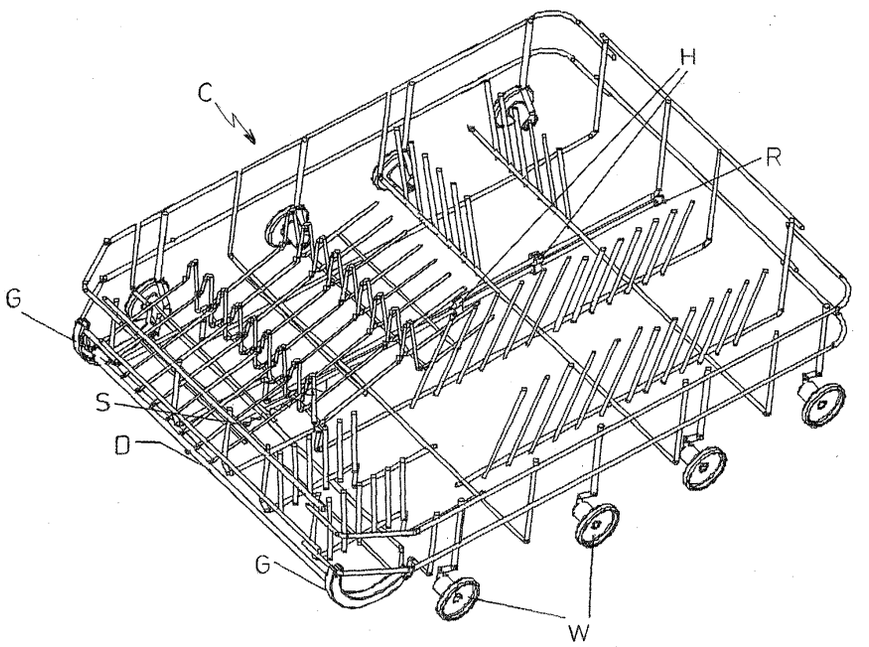

Fig.1

EP 1 464 269 A1

Description

[0001] The present invention relates to dishwasher baskets, and in particular to a basket provided with a mobile front drop-tray.

[0002] It is known that in conventional dishwashers with front door the latter is hinged along the bottom side and also acts as a support for the lower basket when the latter is pulled out of the washing tank.

[0003] It is also known that during the dish loading operation it is probable that drops or food rests fall on the underlying door, and it is therefore necessary that the basket does not project from any side of the door to prevent soiling of the floor. Still better is having the basket not project from the area that, when the door is closed, is reached by the washing jets in order to achieve also the cleaning of the internal surface of the door.

[0004] However this known solution has drawbacks in the case when the door is not sufficiently high to completely include the vertical projection of the basket when the latter is completely pulled out.

[0005] In fact there are cases of reduced height dishwashers, usually provided with a single basket, in which the door height is smaller than or equal to the length of the washing tank, and therefore of the basket length. It is thus necessary to limit the extraction of the latter to prevent soiling outside the door, in the dish loading phase, but this implies greater difficulty in placing the dishes in the rear portion of the basket which remains inside the washing tank.

[0006] Therefore the object of the present invention is to provide a basket which overcomes the above-mentioned drawbacks.

[0007] This object is achieved by means of a basket provided with a front drop-tray which is mobile between a substantially horizontal position, when the basket is in the extracted position, and a substantially vertical position, when the basket is closed inside the washing tank. Other advantageous features are disclosed in the dependent claims.

[0008] The main advantage of the dishwasher basket according to the present invention is that of being able to be pulled out even beyond the top edge of the door, to have the greatest ease of loading yet without risks of floor soiling or of creating dirt build-up areas on the door internal surface.

[0009] A second advantage of this dishwasher basket is that of providing the automatic movement of the drop-tray without requiring an intervention by the user.

[0010] A further advantage of the present basket stems from the mobility of the drop-tray which is not an obstacle to the washing jets in the washing phase.

[0011] Still another advantage of this basket is given by its simple, cheap and reliable structure which does not require any change to the dishwasher, whereby it can be applied as replacement basket to an existing dishwasher.

[0012] These and other advantages and characteristics of the dishwasher basket according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Fig.1 is a perspective top view showing the basket with the drop-tray in the vertical position, as if it were in the washing tank;

Fig.2 is a side view similar to the preceding one;

Fig.3 is a diagrammatic vertical sectional view of a dishwasher with a completely pulled out conventional basket;

Fig.4 is a view same as the preceding one of a dishwasher with a basket according to the invention; and

Fig.5 is a view similar to the preceding one of the dishwasher of fig.4 during the washing cycle, with the basket having the drop-tray in the vertical position.

[0013] With reference to figures 1 and 2, there is seen that a dishwasher basket according to the invention conventionally includes a structure C of metallic wire, provided with wheels W for a smooth sliding along the guides formed in the washing tank and on the door.

[0014] The novel aspect of the present basket is given by the presence of a front drop-tray D, extending below the front portion of the basket with a width substantially equal to the width of structure C. The drop-tray D is mobile along lateral arcuate guides G, secured to structure C, extending over an arc of about 90° so that it can move between a substantially vertical position (figs.1, 2, 5) and a substantially horizontal position (fig.4).

[0015] In this second position, the concave profile of the drop-tray D is capable of properly retaining the drops and rests falling from the dishes loaded in the front portion of the basket. Therefore even if this portion is located beyond the top edge of the door there is no risk of soiling the floor or the door in the area not reached by the washing jets.

[0016] In the preferred embodiment illustrated in the drawings, the means which provide the automatic movement of the drop-tray D are a central longitudinal rod R and a return spring S. The rod R, a little shorter than the basket, is pivoted on the drop-tray D and slidably mounted on suitable supports H secured to the basket structure C, while spring S is secured between the drop-tray D (or rod R) and structure C.

[0017] In the light of the description above, and with reference also to figures 3 to 5, the simple and effective operation of the dishwasher basket is readily understood. In particular, the comparison between figs.3 and 4 clearly shows the advantage provided by the drop-tray D in the dish loading phase.

[0018] A conventional basket introduced into a dishwasher having an internal height Y of door K which is significantly smaller than the basket length L can not be pulled out beyond limit E. In this position the basket re-

mains for a significant length LI inside the washing tank T, while only the external length LE is easily accessible for the user (fig.3).

[0019] A basket according to the invention introduced in the same dishwasher can on the contrary be pulled out beyond limit E up to a new limit E', well beyond the edge of door K, thanks to the drop-tray D which covers the underlying area. As a consequence, the increase F of the pull-out length which is added to the external length leads to a new external length LE' greater than the previous one, while the internal length LI' is correspondingly reduced. This results in a greater accessibility to the rear portion of the basket and therefore a greater ease of loading for the user (fig.4).

[0020] It should be noted that in this condition rod R projects from the rear of the basket in that spring S has pulled the drop-tray D into abutment against the rear end of guides G, so that it is arranged horizontally below the front portion of the basket to cover the area between limits E and E'.

[0021] When the basket loaded with the dishes is pushed back in the washing tank T, the rear end of rod R abuts against the rear wall of the tank and therefore slides forward on supports H with respect to structure C. As a consequence, rod R pushes forward the drop-tray D, overcoming the resistance of spring S, so that it is arranged almost vertically in the front portion of guides G (fig.5).

[0022] In this condition the washing jets J properly reach the dishes located in the front portion of the basket, and they also provide the cleaning of the drop-tray D.

[0023] It is clear that the above-described and illustrated embodiment of the dishwasher basket according to the invention is just an example susceptible of various modifications. In particular, the exact shape of the drop-tray D and of the relevant guides G can be somewhat changed, and also the driving means consisting of rod R and spring S can be replaced by other mechanically equivalent means, for example by using a torsion spring rather than the coil spring S or elastic members located in the guides G.

[0024] Similarly, the driving means could also carry out the function of supporting the drop-tray D so that the lateral guides G can be dispensed with. For example, there could be provided two rods R symmetrically arranged with respect to the basket midplane and pivoted on the drop-tray D so as to make it rotate in the vertical or horizontal position according to the position of said rods R, or the guide elements could be formed directly in the basket structure C.

[0025] Finally, it is obvious that it would also be possible to dispense with the driving means and leave up to the user the task of manually moving the drop-tray D, but this would clearly imply a loss of practicality of the present basket.

Claims

1. A dishwasher basket including a metallic wire structure (C), **characterized in that** it further includes a front drop-tray (D) extending below the front portion of the basket with a width substantially equal to the width of said structure (C), said drop-tray (D) being mobile between a substantially vertical position when it is introduced into the washing tank (T) and a substantially horizontal position when it is pulled out of the washing tank (T).

2. A dishwasher basket according to claim 1, **characterized in that** it includes driving means to automatically move the drop-tray (D) between the two positions.

3. A dishwasher basket according to claim 2, **characterized in that** the drop-tray (D) is introduced into lateral guides (G) secured to the basket structure (C), the driving means of the drop-tray (D) consisting of a longitudinal rod (R) pivoted on the drop-tray (D) and slidably mounted on suitable supports (H) secured to the basket structure (C), and of at least an elastic member suitable to push the drop-tray (D) to the horizontal position.

4. A dishwasher basket according to claim 3, **characterized in that** said elastic member is a return spring (S) secured between the structure (C) and the drop-tray (D) or said rod (R).

5. A dishwasher basket according to claim 3 or 4, **characterized in that** it includes an elastic member in each guide (G).

6. A dishwasher basket according to claim 2, **characterized in that** the driving means of the drop-tray (D) consist of at least two rods (R) slidably mounted on suitable supports (H) secured to the basket structure (C) and pivoted on the drop-tray (D) so as to rotate it to the vertical or horizontal position according to the position of said rods (R), as well as of at least an elastic member suitable to push the drop-tray (D) to the horizontal position.

7. A dishwasher basket according to claim 6, **characterized in that** it includes at each rod (R) a return spring (S) secured between the structure (C) and the drop-tray (D) or said rod (R).

8. A dishwasher basket according to one or more of the preceding claims, **characterized in that** it includes guide elements for the drop-tray (D) which are directly formed in the metallic wire structure (C).

9. A dishwasher according to one or more of the preceding claims, **characterized in that** the drop-tray

(D) has a concave profile.

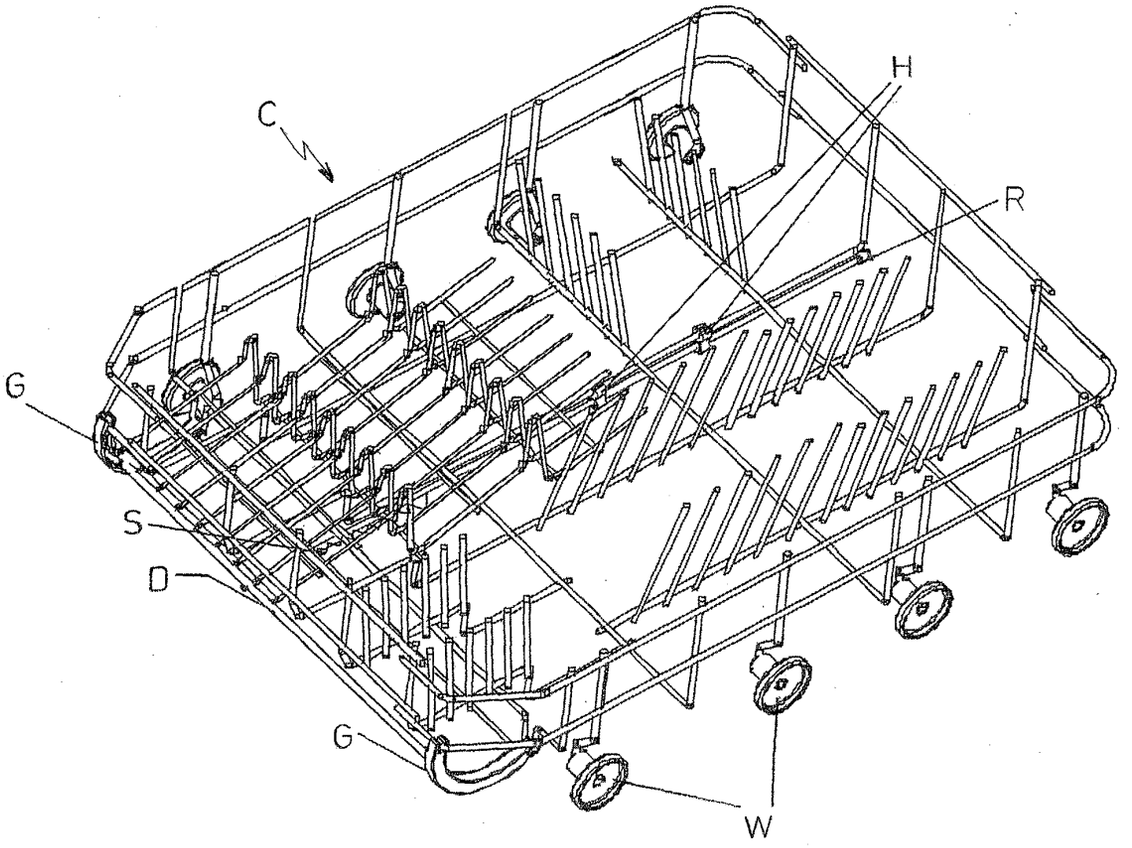

Fig.1

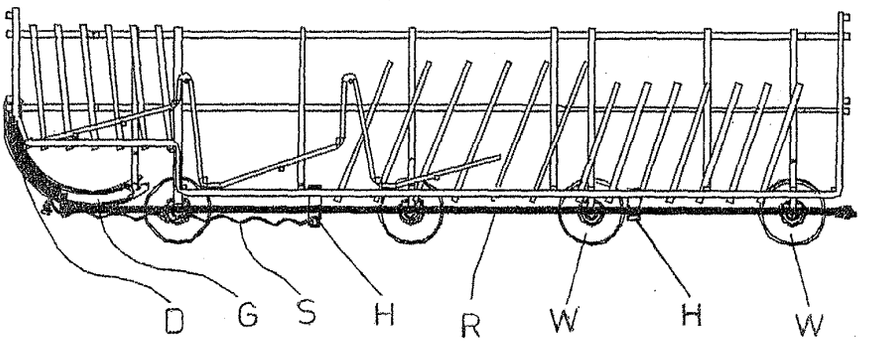

Fig.2

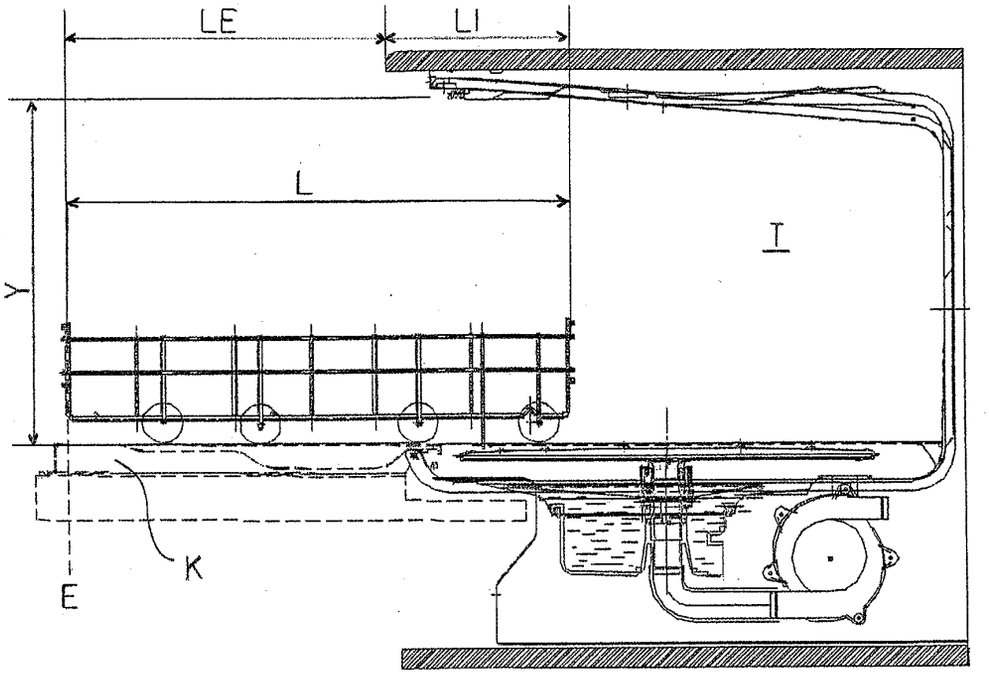

Fig.3

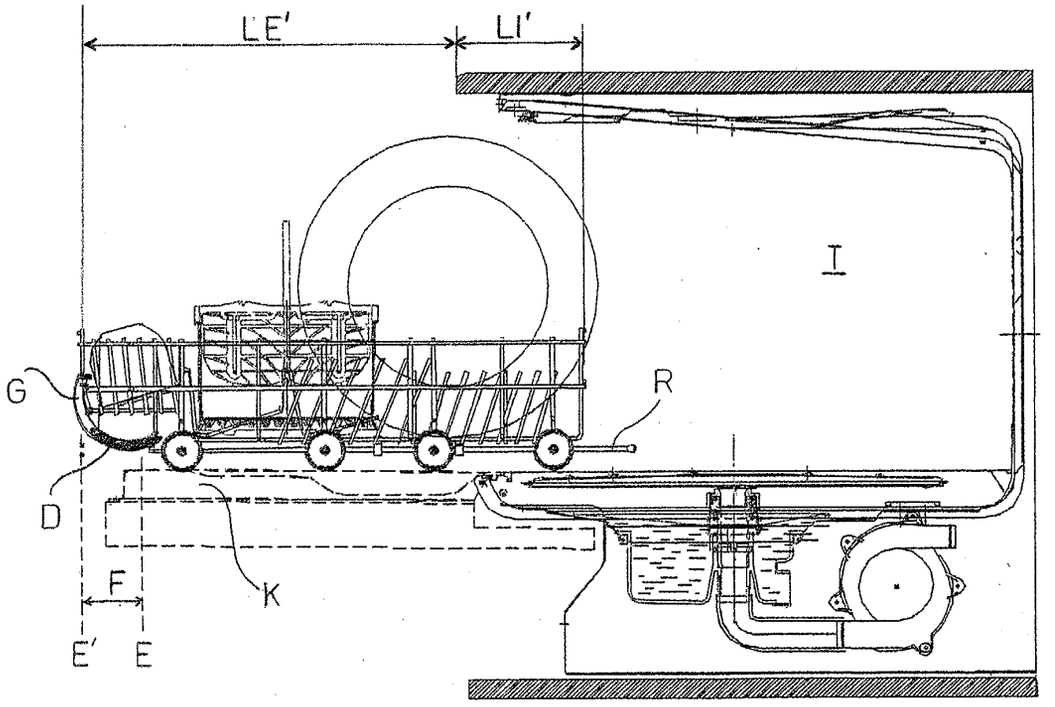

Fig.4

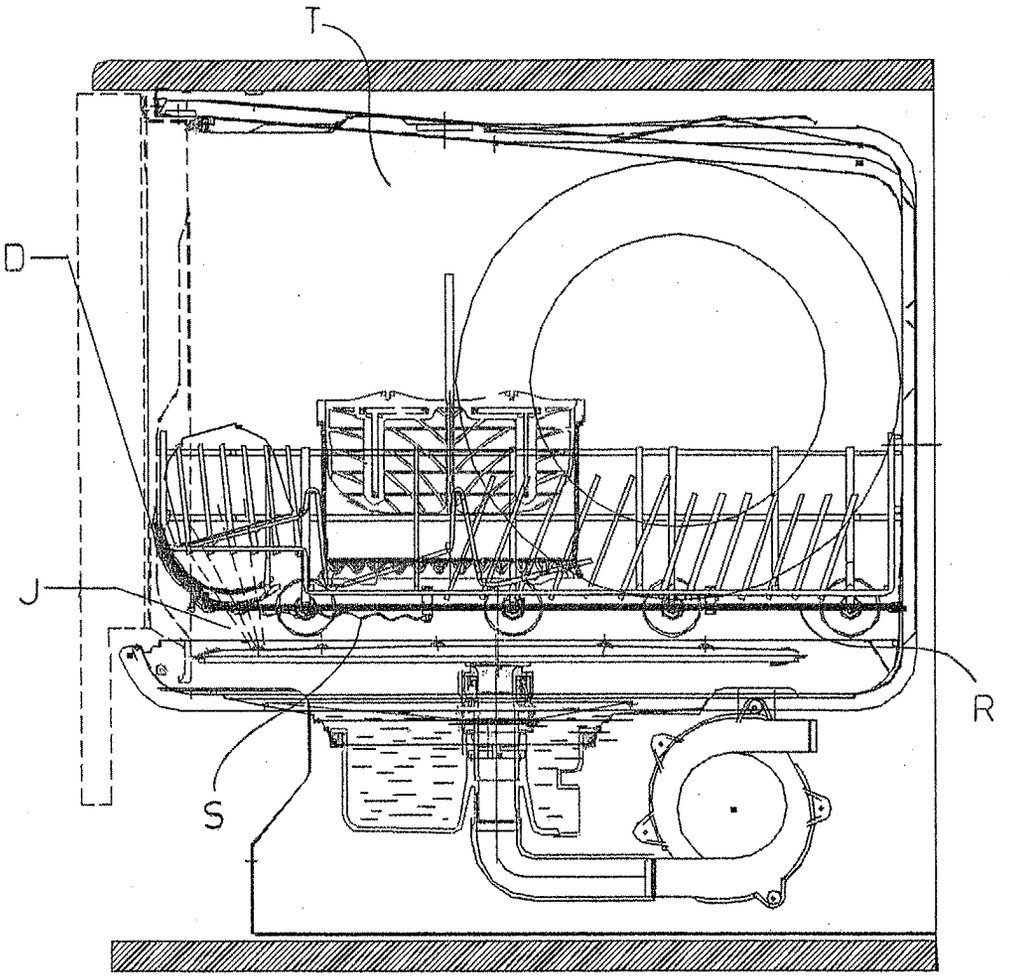

Fig.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5206

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)
A	US 2002/148493 A1 (WENDT KARL R C ET AL) 17 October 2002 (2002-10-17) * page 1, paragraph 16 - page 2, paragraph 19; figures 3-5 *	1-9	A47L15/50
A	US 3 306 694 A (HAUSER CHARLES E) 28 February 1967 (1967-02-28) * column 4, line 13 - line 18; figures 1-3 *	1-9	
A	US 3 099 585 A (KAHN LEO M) 30 July 1963 (1963-07-30) * the whole document *	1-9	
A	GB 925 989 A (LEO MARCUS KAHN) 15 May 1963 (1963-05-15) * the whole document *	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	11 September 2003	Lodato, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 42 5206

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-09-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002148493 A1	17-10-2002	CA 2373971 A1	12-10-2002
US 3306694 A	28-02-1967	NONE	
US 3099585 A	30-07-1963	CH 390481 A	15-04-1965
		DE 1194544 B	10-06-1965
		FR 1237486 A	29-07-1960
		GB 937751 A	25-09-1963
GB 925989 A	15-05-1963	NONE	