



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 364 609 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.11.2003 Bulletin 2003/48

(51) Int Cl.7: **A47L 15/42**

(21) Application number: **02425296.7**

(22) Date of filing: **15.05.2002**

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

(72) Inventor: **Gobbi, Ezio**
46037 Roncoferraro MN (IT)

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

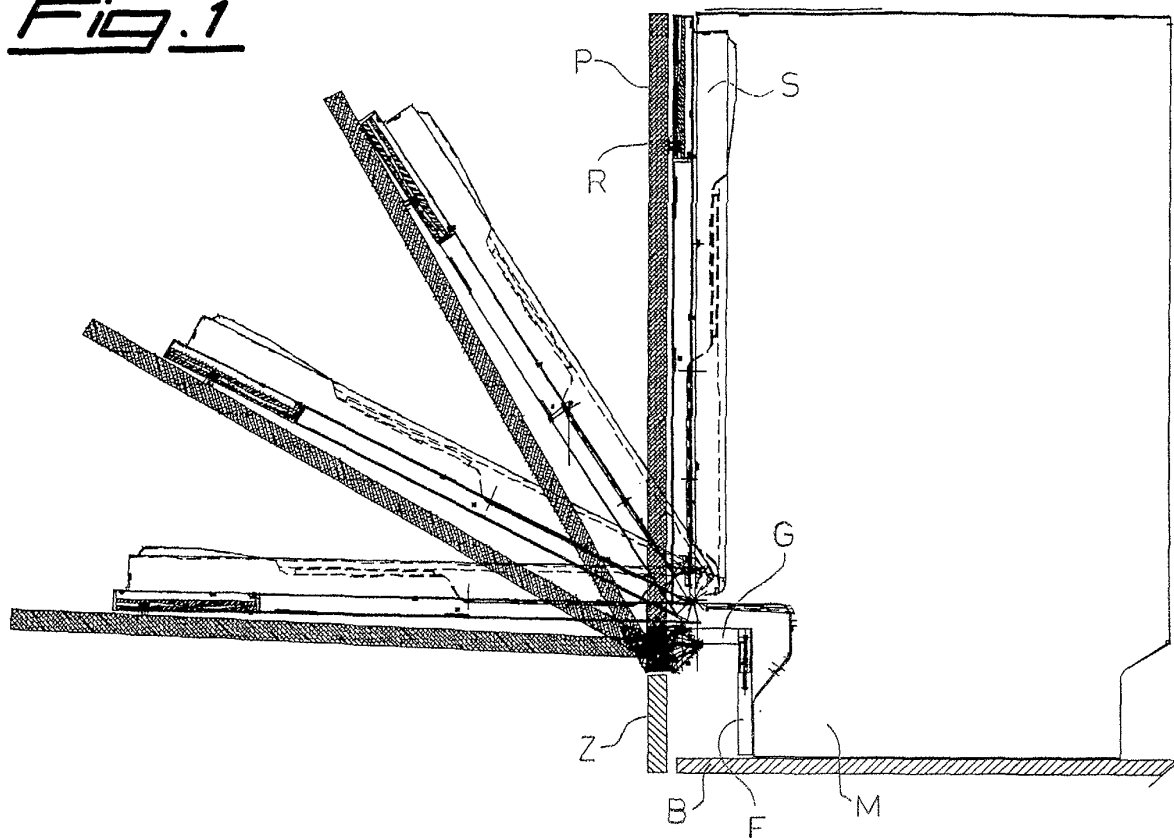
(71) Applicant: **Bonferraro S.p.A.**
37060 Bonferraro (VR) (IT)

(54) **Built-in domestic appliance with decorative panel applied to the door**

(57) In a built-in domestic appliance with a door (S) hinged along its bottom side and provided with a decorative panel (P), the latter is applied through a mounting system including a top sliding coupling (R) between the panel (P) and the door (S), and a bottom parallelogram hinge connecting the panel (P) to a support (G) which is in turn carried by a bracket (F) secured to the appli-

ance base (M), the vertical position of the support (G) being preferably adjustable. In this way the machine can be easily and quickly installed inside the furniture without requiring any modification of the latter and it is also possible to mount panels of greater height simply by adjusting the position of the support (G) without affecting neither the housing furniture nor the accessibility to the controls.

Fig. 1



EP 1 364 609 A1

Description

[0001] The present invention relates to built-in domestic appliances having the door lined with a decorative panel, and in particular to domestic appliances installed in kitchen furniture which completely encloses them (so-called "fully integrated"). Reference will be made hereafter to a dishwasher while it is clear that what is said applies to any other domestic appliance having a similar door hinged along its bottom side, e.g. a washing machine.

[0002] This type of decorative panel is known to be used to camouflage a built-in appliance so that it blends with the kitchen furniture. This is achieved by applying to the door of said appliance, by various means, a panel having the same appearance of the other doors. In this way there is no visible element allowing to distinguish the appliance from the other members which make up the kitchen, its controls being accessible only when the door is open.

[0003] However, the presence of this panel poses a particular problem in the case of installation inside a piece of furniture, i.e. when the dishwasher rests on the bottom of the furniture and is placed flush with the side walls thereof. In fact in this case the panel must also cover the front edge of said side walls, same as normally occurs with the other doors. But in this way it would interfere with the walls when the dishwasher door is opened and the panel moves back into the space behind the plinth.

[0004] The solutions presently available to prevent such an interference are only those of forming a recess in the side walls or of hinging the panel directly to the piece of furniture which contains the dishwasher. In the first case it is required to carry out a significant work of furniture adaptation to form in the sides the space for receiving the panel when the door is opened. In the second case it is necessary to mount a spacer on the bottom of the furniture and to find the exact hinging level for a smooth operation of the panel. Moreover, the plinth cannot be applied and must be replaced by an underlying element, such as the front face of a bottom drawer, to cover the spacer and the hinges mounted thereon.

[0005] In both cases these additional workings make the installation long and costly, and moreover the direct mounting on the furniture causes a further drawback. In fact the presence of the spacer on the furniture bottom makes complicated to pull the dishwasher out of the furniture if need arises for a maintenance intervention, since it is necessary to take away and then put back in place the spacer on the furniture as well as the panel on the dishwasher door.

[0006] It should be noted that these mounting solutions cannot even be standardized, in that the required working changes depending on the panel height and therefore on the hinging level which corresponds to the position of the panel flush with the kitchen top when the door is closed.

[0007] Moreover, in the case of mounting on the door of panels having a height greater than the standard height of 720 mm the panel must be mounted higher on the door. This is necessary to prevent the interference of the panel with the dishwasher base at the end of the door opening, otherwise the door could not open completely to 90°. This implies not only a poor accessibility to the controls located along the top edge of the door due to the projecting panel, but even the need to raise the kitchen top and therefore introduce a supporting structure in the space which is created between said top and the dishwasher top.

[0008] Therefore the object of the present invention is to provide a domestic appliance provided with a mounting system for the decorative panel suitable to overcome the aforementioned drawbacks.

[0009] This object is achieved by means of a domestic appliance in which the panel is mounted through a top sliding coupling between the panel and the door and a bottom parallelogram hinge secured to the base of the machine itself, preferably through a height-adjustable support.

[0010] The main advantage of the domestic appliance with the panel mounting system according to the present invention is the possibility of easily and quickly carrying out the installation inside the furniture without requiring any modification of the latter.

[0011] A further advantage of this solution is that of being able to mount also panels of greater height simply by adjusting the position of the bottom hinge support without affecting neither the housing furniture nor the accessibility to the controls.

[0012] Still another advantage of the present system stems from its extreme structural simplicity which makes it cheap and reliable.

[0013] These and other advantages and features of the domestic appliance according to the present invention will be evident to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the attached drawings, wherein:

Fig. 1 is a diagrammatic sectional side view showing a dishwasher according to the invention provided with a standard-size panel;

Fig. 2 is a view similar to the preceding one of a dishwasher provided with an oversize panel;

Fig. 3 is an enlarged side view of the bottom members of the panel mounting system, with the door in the closed position;

Fig. 4 is a view similar to the preceding one with the door in the initial opening phase;

Fig. 5 is a view similar to the preceding one with the door fully open;

Fig. 6 is an enlarged side view of the top members of the panel mounting system, with the door in the closed position;

Fig. 7 is a view similar to the preceding one with the door in the initial opening phase; and

Fig. 8 is a view similar to the preceding one with the door fully open.

[0014] With reference to Figs. 1, 3 and 8, there is seen that a dishwasher introduced inside a piece of furniture (only the bottom B of the latter being shown) includes a decorative panel P applied to the door S, the distance between the bottom edge of panel P and the furniture bottom B being covered by a plinth Z. Panel P is applied to the dishwasher through a mounting system including a top sliding coupling R and a bottom parallelogram hinge mounted on an L-shaped support G which is in turn inserted onto a bracket F secured to the dishwasher base M.

[0015] More specifically, panel P carries at its bottom end a bracket H connected through pins C to rods J, K which are in turn connected through pins D at their opposite ends to said support G. The latter is inserted onto bracket F through slide guides (not shown) and secured by screws V whose vertical position can be adjusted within adjustment slots A formed in bracket F. The dotted lines T of Fig.3 illustrate the paths of pins C during the opening movement.

[0016] At the top end, coupling R consists of a pin X, integral with panel P, which slides with bi-directional restraint along a shaped channel Y formed in the top portion of door S. The shape of channel Y is designed to prevent interference between panel P and door S during the opening, due to the relative angle which is formed, and also to keep a proper axial play.

[0017] The simple and effective operation of the present mounting system for panel P is readily understood from the description above with the help of the other figures.

[0018] In the first opening phase from Figs.3 and 6 to Figs.4 and 7, corresponding to about a 30° opening, rods J, K rotate upward around pins D being drawn by bracket H through pins C, while pin X moves along the first portion of channel Y shifting outward to compensate for the different hinging level of door S with respect to panel P.

[0019] Upon complete opening at 90°, pin X is in the top portion of channel Y and panel P has returned to the initial distance from door S, while rods J, K of the bottom hinge have reached a substantially horizontal position.

[0020] From these figures it is clear that in no phase of the movement panel P interferes with plinth Z or moves closer to the dishwasher, whereby there is no problem of interference with the furniture sides. Furthermore, since the whole mounting system is secured to the dishwasher, the latter can be easily pulled out of the furniture for maintenance without requiring the removal of any member.

[0021] Also the adaptation to panels of different heights is simple and readily understood from Fig.2. In this case panel P' has a height greater than the standard panel P, and therefore also plinth Z' is correspondingly lower than plinth Z. However this does not pose any

problem since to maintain it flush with the dishwasher top it is sufficient to adjust the position of support G on bracket F, by lowering it along slots A through a distance L equal to the exceeding height of panel P'.

[0022] It is clear that the above-described and illustrated embodiment of the domestic appliance according to the invention is just an example susceptible of various modifications. In particular, the top sliding coupling R may be made in other ways and the same applies to the support/bracket assembly for the bottom hinge as long as the latter is mounted directly on the machine base and positioned so as to keep panel P outside the furniture throughout the opening movement.

Claims

1. A built-in domestic appliance with a door (S) hinged along its bottom side and provided with a decorative panel (P), **characterized in that** said panel (P) is applied to the appliance through a mounting system including a top sliding coupling (R) between the panel (P) and the door (S), and a bottom parallelogram hinge connecting the panel (P) to a support (G) which is in turn carried by a bracket (F) secured to the appliance base (M).
2. A built-in domestic appliance according to claim 1, **characterized in that** the position in height of the support (G) on the bracket (F) is adjustable.
3. A built-in domestic appliance according to claim 1 or 2, **characterized in that** the top coupling (R) consists of a pin (X), integral with the panel (P), which slides with bi-directional restraint along a shaped channel (Y) formed in the top portion of the door (S), the shape of said channel (Y) being designed to prevent interference between the panel (P) and the door (S) during the opening.
4. A built-in domestic appliance according to one or more of the preceding claims, **characterized in that** the panel (P) carries at its bottom end a bracket (H) connected through pins (C) to rods (J, K) which are in turn connected through pins (D) at their opposite ends to an L-shaped support (G).
5. A built-in domestic appliance according to one or more of claims 2 to 4, **characterized in that** the support (G) is mounted onto the bracket (F) by means of screws (V) whose vertical position can be adjusted within adjustment slots (A) formed in the bracket (F).

Fig. 1

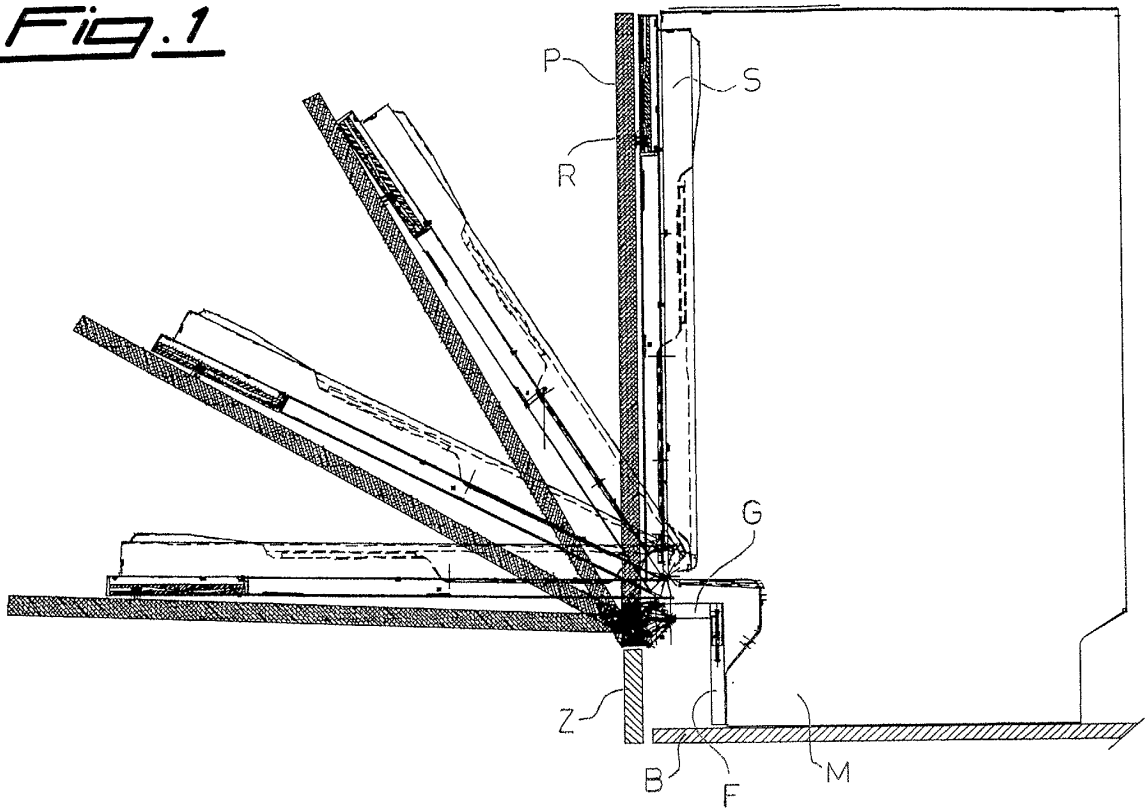
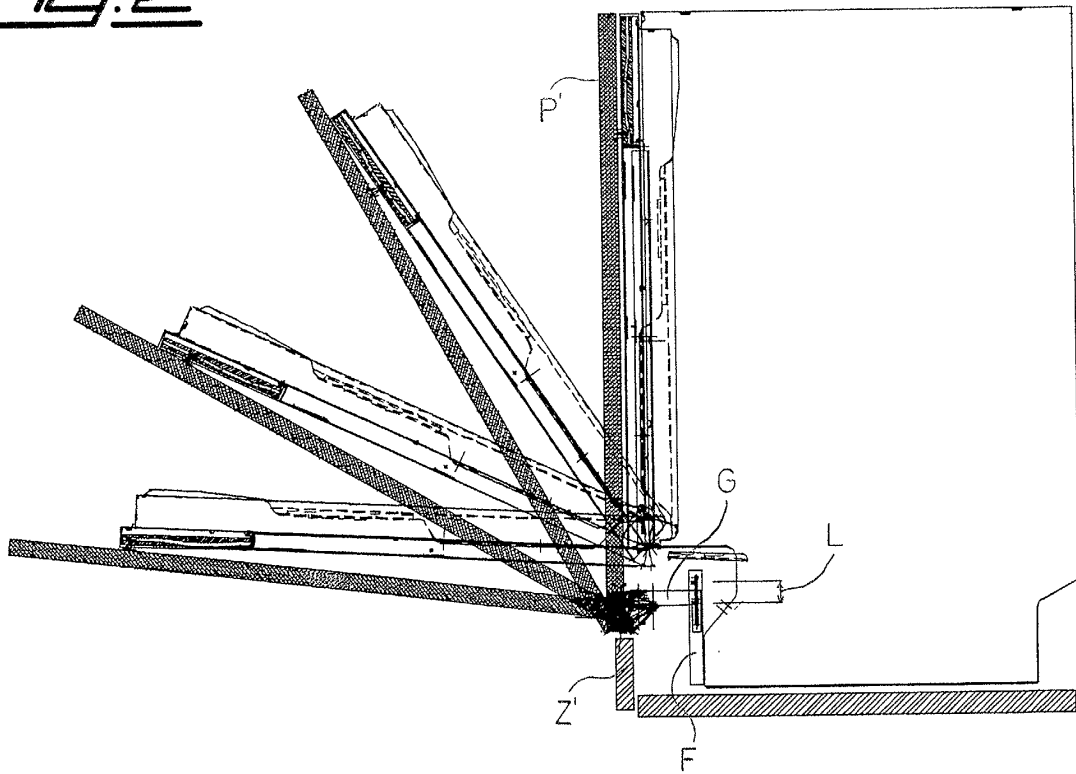


Fig. 2



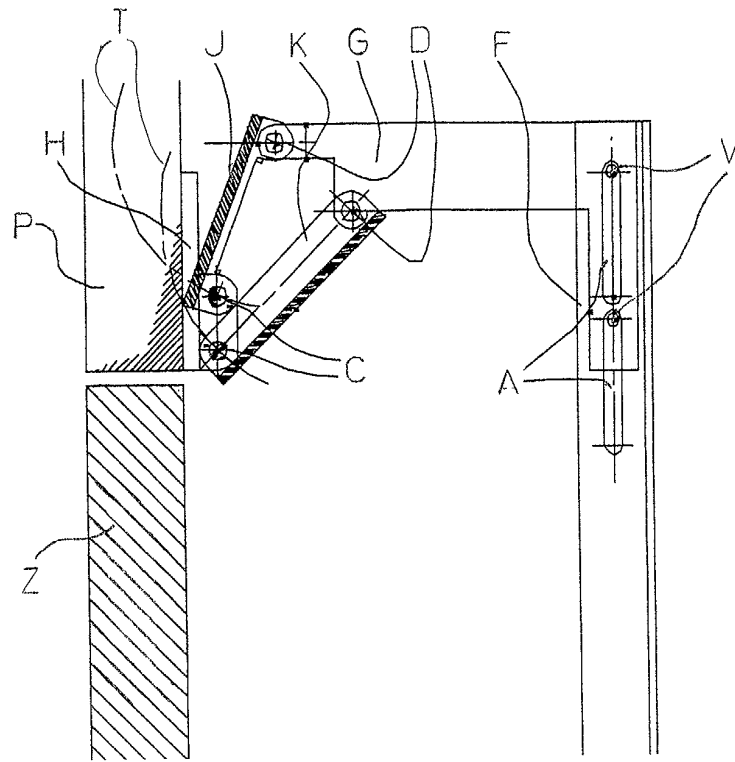


Fig. 3

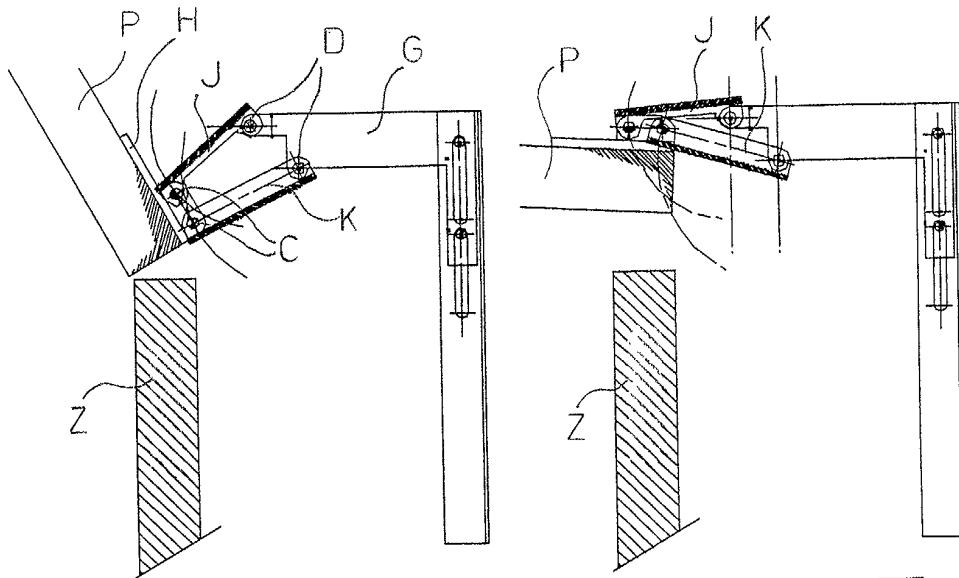


Fig. 4

Fig. 5

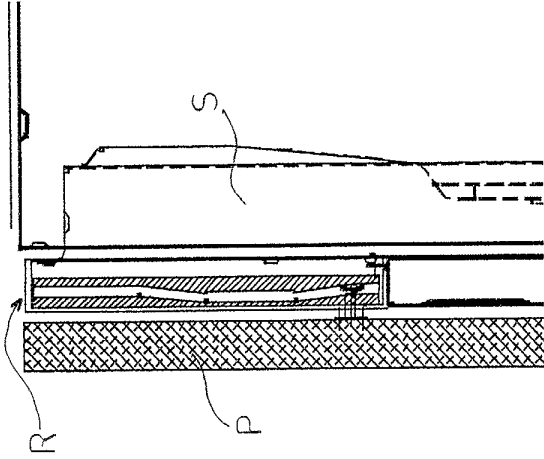


FIG. 6

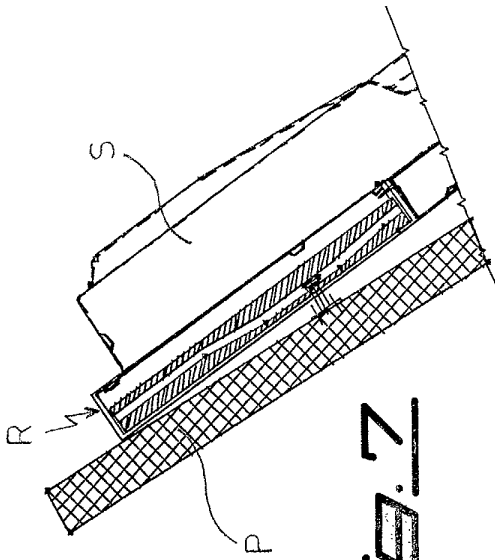


FIG. 7

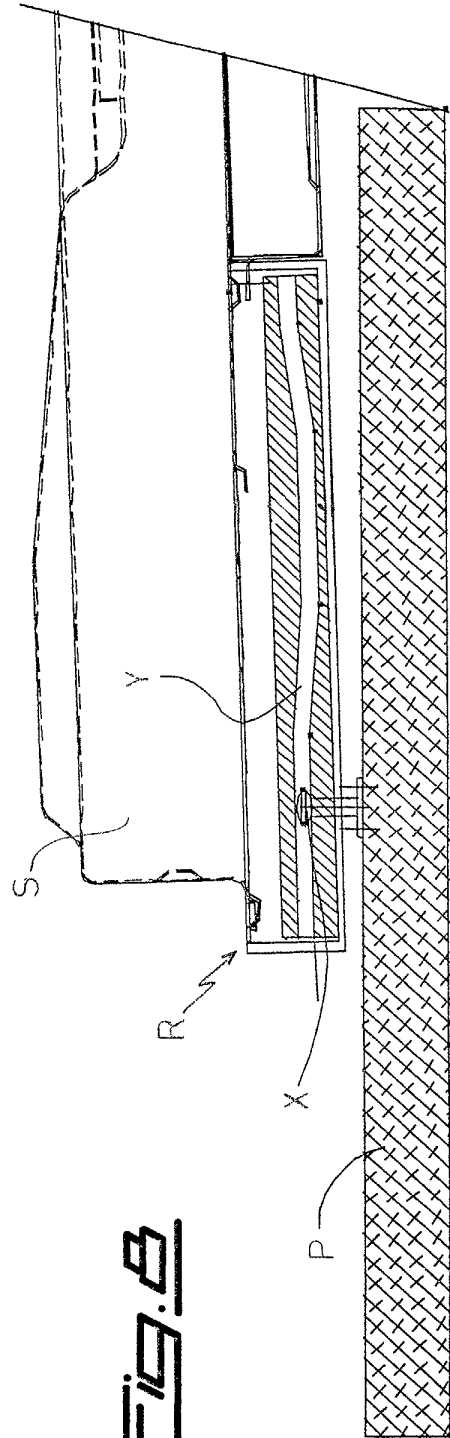


FIG. 8



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5296

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)
Y	FR 2 464 689 A (BOSCH SIEMENS HAUSGERAETE) 20 March 1981 (1981-03-20) * page 4, line 25 - page 5, line 16; figures 1,4 *	1,3,4	A47L15/42
Y	US 5 471 709 A (LANZANI ORESTA) 5 December 1995 (1995-12-05) * column 1, line 25 - line 35 * * column 2, line 13 - line 24 * * column 2, line 63 - column 3, line 8; figures 2,4,5 *	1,3,4	
A	DE 38 26 750 A (BALAY SA) 16 February 1989 (1989-02-16) * column 3, line 37 - line 42 *	2,5	
A	EP 0 420 227 A (MERLONI ELETTRODOMESTICI SPA) 3 April 1991 (1991-04-03) * column 2, line 16 - line 31 *	3	
A	FR 2 464 693 A (BOSCH SIEMENS HAUSGERAETE) 20 March 1981 (1981-03-20) * page 3, line 1 - line 4 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	EP 0 520 963 A (SMEG SPA) 30 December 1992 (1992-12-30) * figures 1-3 *	1	A47L D06F
A	US 4 514 021 A (SUNDERMEIER GUNTER ET AL) 30 April 1985 (1985-04-30) * figure 2 *	4	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
MUNICH		16 September 2002	Papadimitriou, S
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 (P/AC01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 42 5296

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.

16-09-2002

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
FR 2464689	A	20-03-1981	DE	2937404 A1	02-04-1981
			FR	2464689 A1	20-03-1981
			IT	1132824 B	09-07-1986

US 5471709	A	05-12-1995	IT	1271922 B	10-06-1997
			DE	4345081 A1	14-07-1994
			ES	2089960 A2	01-10-1996
			FR	2706120 A3	16-12-1994
			GB	2274677 A , B	03-08-1994

DE 3826750	A	16-02-1989	ES	2008727 A6	01-08-1989
			DE	3826750 A1	16-02-1989
			FR	2619001 A1	10-02-1989
			GB	2208527 A	05-04-1989

EP 0420227	A	03-04-1991	IT	1233910 B	21-04-1992
			EP	0420227 A1	03-04-1991

FR 2464693	A	20-03-1981	DE	2937455 A1	02-04-1981
			FR	2464693 A1	20-03-1981
			IT	1132822 B	09-07-1986

EP 0520963	A	30-12-1992	IT	222647 Z2	24-04-1995
			DE	69209165 D1	25-04-1996
			DE	69209165 T2	28-11-1996
			EP	0520963 A1	30-12-1992
			ES	2085609 T3	01-06-1996

US 4514021	A	30-04-1985	DE	3215607 A1	27-10-1983
			AT	393068 B	12-08-1991
			AT	127283 A	15-01-1991
			FR	2525448 A1	28-10-1983
			GB	2119435 A , B	16-11-1983
			SE	442036 B	25-11-1985
			SE	8302378 A	28-10-1983
