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(54) **System for the fastening of a front panel to the door of a household appliance.**

(57) The invention relates to a system for fastening a front panel to the door of a household appliance, particularly a dishwasher, wherein the door (7) and the panel (1) are connected together by means of an articulated leverage comprising at least an upper arm (4) and a lower arm (5); the main feature of the described system is that there is provided a magnetic element (9), connected to the panel, which in the closed-door position cooperates with the door in order to keep the panel adjacent to the door.

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SYSTEM FOR THE FASTENING OF A FRONT PANEL TO THE DOOR OF A HOUSEHOLD APPLIANCE

The present invention refers to a system for fastening a front panel to the door of a household appliance, particularly a dishwasher, wherein the door and the panel are connected together by means of an articulated leverage comprising at least an upper and lower arm. A system of the cited type is disclosed by the English Patent Application No. 2 079 589.

In this system, a front panel, having aesthetical functions, is connected to the door of a dishwashing machine by means of two pivoted arms, an upper one and a lower one, which constitute, together with the panel and the door, a parallelogram system.

The purpose of such a system is to allow the detachment of the panel from the door during the door opening; in fact the panel, for aesthetical reasons, is longer than the door, from which it projects inferiorly, and without said artifice the door could not be open. In the door-open position the panel is kept apart from the door, by virtue of its same weight; in the closed position it is kept more or less adherent to the door, also in this case due to gravity.

However, if the machine has not a perfect vertical standing, the door can stay away from the door even in the closed-door position; furthermore the fastening of the two pivoted arms to the panel (which usually is made out of wood, block wood or pressed chip wood, but it could also be made out of plastics or other appropriate material) can give rise to some problems, concerning the positioning precision, particularly when the panel has to be substituted outside the manufacturing factory, to adapt it to the user's need, or when it has been damaged during the transport.

It is the object of the present invention to obviate the cited drawbacks of the known system, teaching as it is possible to obtain a simple and functional system for fastening a front panel to the door of a household appliance.

To obtain said object, the subject of the present invention is a system for fastening a front panel to the door of a household appliance, particularly a dishwasher, wherein the door and the panel are connected together by means of an articulated leverage comprising at least an upper arm and a lower arm, characterized in that there is provided a magnetic element, connected to the panel, which in the closed-door position, cooperates with the door, in order to keep the panel adjacent to the door.

Further objects and advantages of the present invention will be clear from the detailed description which follows and from the attached drawings,

which are supplied only as an explanatory and not limiting example, wherein the figure shows schematically a system for the fastening of a front panel to the door of a dishwashing machine according to the invention.

With reference to the figure, which shows schematically in section a system for fastening a front panel to the door of a dishwashing machine according to the invention, there can be seen three parts, indicated with the letters A, B and C.

The part A represents in view the fastening system, in the closed-door position; the part B represents the same system in cross-section; the part C represents in cross-section the system in the open-door position.

In the figure, reference number 1 indicates the panel; reference number 2 indicates a vertical element of the parallelogram system, which is fixed to the panel by means of screws 3.

Reference number 4 indicates the upper pivoted arm of the parallelogram, and reference number 5 indicates the lower pivoted arm.

Both the arms are pivoted to the vertical element 2 and to a further vertical element, indicated with reference number 6, fixed to the metal sheet door, a part of which can be seen at the points 7 and 7a. As it can be seen in the part A of the figure, the vertical element 6 has at a given point a lozenge-shaped redoubling, so that a central portion of the door metal sheet, indicated with reference number 8, remains uncovered.

Reference number 9 indicates a permanent magnet, connected to the upper arm 4, which in the closed-door position, touches the metal sheet of the door in the position 8, so keeping the panel 1 adjacent to the door 7. In the position 10 it is indicated one of the bolts fixing the vertical element 6 to the door 7.

The metal sheet of the door 7 has, how it can be seen from the figure, an oval shaping or dishing, which determines a space useful to contain the parallelogram and in particular the arms 4 and 5, in order to avoid that the panel 1 remains away from the door 7 in the closed position.

The magnet 9 is fixed to the upper arm 4 so that it can be axially moved, by screwing or unscrewing its threaded shank. So, in the upper arm it is obtained at least a threaded hole and the shank of the magnet is threaded; the magnet is then screwed to the upper arm, and its axial positioning in respect of the door metal sheet can be adjusted in the closed position.

The positioning of magnet 9 can also be changed in the vertical direction, along the upper arm 4, in order to adjust the detachment resistance

of the panel from the door.

There can be consequently obtained three holes along the upper arm 4, which correspond to three positions (minimum, medium and maximum) which allow the adjusting of the detachment resistance of the panel from the door, in function of the weight and the barycenter of the wood utilized, according to the hole where the magnet is screwed in. The characteristics of the described system for fastening a front panel to the door of a household appliance are clear from the given description and the annexed drawing.

Also clear are the advantages of the system for fastening a front panel to the door of a household appliance object of the present invention.

Particularly, they are represented by the fact that the positioning of the two pivoted upper and lower arms (4 and 5), permanently connected between themselves through the two vertical elements 2 and 6, is not altered if the panel is substituted, and by the fact that, in any case, the adherence of the panel to the door, in the closed-door position, is assured in a perfect way, by virtue of the magnet 9.

A simple variation to the described system can be realized, for example, by fixing the magnet 9 to the lower arm 5 so that, with the door closed, the magnet touches the uncovered metal sheet of the door, in a point lower than point 10.

Furthermore, the fixing between the magnet and the upper and lower arm can be advantageously realized without the threading of the shank. A perfect adjustment of the application of the magnet against the metal sheet of the door can also be obtained by providing, instead of the threaded hole on the upper (4) or lower (5) arm, a slot which allows small movements, along the arm 4 or 5, of the shank supporting the magnet. In this way small angular variations in respect of the door plane are allowed to the shank itself, so to recover the eventual manufacturing tolerances, which could not permit a perfect coplanarity between the magnet surface and the plane of the door metal sheet and could consequently reduce the fastening action of the magnet. In this solution the fixing of the shank to the slot can be advantageously obtained by means of an elastic ring.

However, it is obvious that many other variations to the system for fastening a front panel to the door of a household appliance described as an example are possible for the man skilled in the art, without departing from the novelty principles inherent to the invention.

Claims

1. System for fastening a front panel to the door of

a household appliance, particularly a dishwasher, wherein the door (7) and the panel (1) are connected together by means of an articulated leverage comprising at least an upper arm (4) and a lower arm (5), characterized in that there is provided a magnetic element (9), connected to the panel (1), which in the closed-door position, cooperates with the door (7) in order to keep the panel (1) adjacent to the door (7).

2. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 1, characterized in that in order to connect together the door (7) and the panel (1) there is provided a complete articulated parallelogram (2,4,5,6).

3. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 2, characterized in that the parallelogram comprises a first vertical element (2), fixed to the panel (1), a second vertical element (6), fixed to the door (7), an upper arm (4), pivoted to the first vertical element (2) and to the second vertical element (6) and a lower arm, also pivoted to the first vertical element (2) and to the second vertical element (6).

4. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 1, characterized in that it comprises means which allow said magnetic element (9) to move along its own axis and/or a variation of the angle of said axis.

5. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 1, characterized in that said magnetic element (9) is fixed to the upper pivoted arm (4).

6. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 4 and 5, characterized in that said means which allows the axial movement of the magnetic element (9) is a threaded hole obtained in the upper pivoted arm (4) and a threaded shank of the magnetic element (9) which has to be fixed to the upper pivot arm (4).

7. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 1, characterized in that it comprises means which allows the magnetic element (9) to move in the vertical sense on the upper pivoted arm (4).

8. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 5 and 7, characterized in that said means which allows the movement in the vertical sense of the magnetic element (9) are realized by means of two or more threaded holes obtained in the upper pivoted arms (4), in the longitudinal sense in respect of the arm itself.

9. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 3, characterized in that said second vertical element (6) presents a redoubling, so to determine a central uncovered zone (8) of the metal sheet of the door (7). 5

10. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 9, characterized in that said central uncovered zone (8) of the metal sheet of the door (7) is a correspondent element, cooperating the the magnetic element (9) in order to keep the panel adjacent to the door (7). 10

11. System for fastening a front panel to the door of a household appliance, particularly a dishwasher, according to claim 2, characterized in that said door (7) has a shaping in the metal sheet in order to let space available for the parallelogram, so that the panel (1) remains adjacent to the door (7) in the closed position. 15 20

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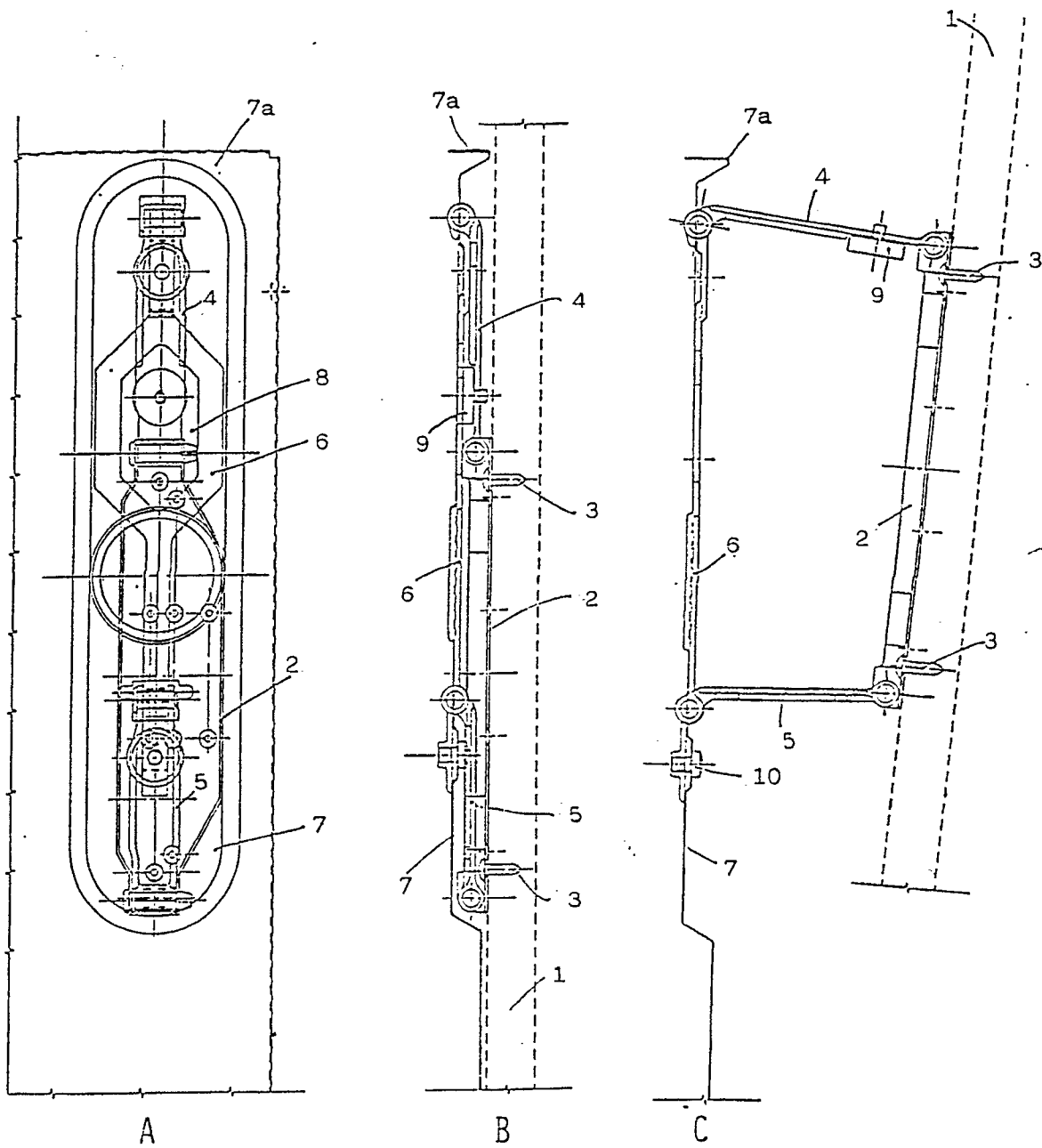
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FIG.





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EUROPEAN SEARCH REPORT

Application Number

EP 90 11 8537

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.5)
X	DE-A-3 026 637 (EURO HAUSGERAETE GMBH) * page 5, lines 1 - 7; figures 1-4 *	1-3	A 47 L 15/42
A	FR-A-2 619 001 (BALAY S.A.) * the whole document *	1-3	
A	EP-A-0 047 685 (ESSWEIN S.A.) * the whole document *	1-3	
A	EP-A-0 046 314 (SMEG)		
D,A	GB-A-2 079 589 (ZANUSSI)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 47 L
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 12 December 90	Examiner SCHARTZ J.
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