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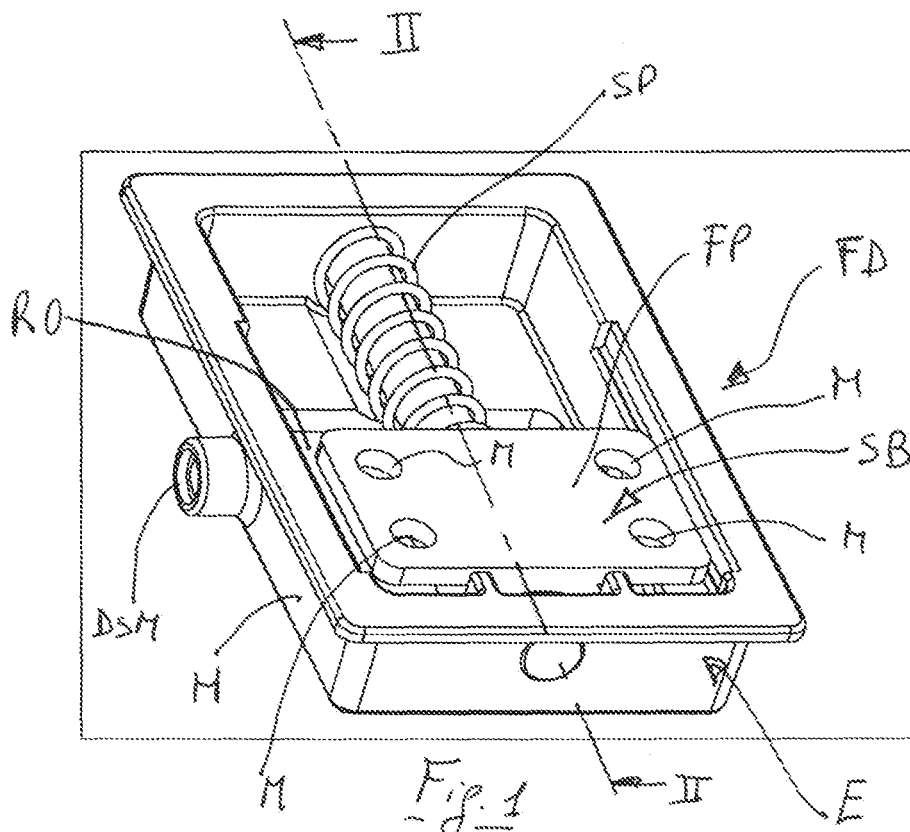
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(54) **Slidable fixation for the aesthetic panel on a dishwasher door**

(57) A device for the fixation of a decorative panel (DP) on an appliance door (D), particularly suitable for a built in dishwasher door comprising an housing (H) suitable to be fitted and secured to said door (D), a shaft

(SH) longitudinally arranged into said housing (H), a slidable element (SB) mounted on said shaft (SH) said slidable element (SB) being suitable to be connected with the decorative panel (DP).



Description

[0001] The present invention concerns a door for a household appliance, in particular for a dishwasher. More specifically, the present invention concerns a device for the fixation of a decorative panel on an appliance door, particularly suitable for a built in dishwasher door.

[0002] Household appliances such as dishwashers are quite popular nowadays. It is known how the market very often requires that these appliances are arranged as an integral part of the home furnishings. This choice, in fact, offers considerable advantages from the ergonomics and aesthetics of the home environment.

[0003] Unfortunately, since the appliance has to be inserted in an environmental context that is different from time to time, its structure needs often to be arranged in order to properly match the surrounding furniture. To this aim, for example, adjustable plinth elements or removable spacers are commonly used.

[0004] In addition, aesthetic door panels are often used to provide the exterior of the appliance with a design that aesthetically matches with the design lines of neighboring pieces of furniture.

[0005] The fastening of these aesthetic panels is often cumbersome and they remarkably extend beyond the hinge line of the door to cover the plinth region of the appliance.

[0006] Even if they considerably improve the external aesthetic appearance of the appliance, these aesthetic panels have a considerable impact from the functional point of view. In fact, their remarkable height may be of prejudice for a correct rotation of the door, particularly during its opening movement.

[0007] In order to solve this problem, the height of the appliance structure or body may be varied but this choice introduces severe constraints for a correct matching of the appliance with the surrounding furniture.

[0008] Thus, some known appliances have been provided with relatively complex hinged and/or geared mechanisms to operatively connect the door and the main body of the appliance. Thanks to these mechanisms, the door can move according to a translational trajectory with respect to main body of the appliance.

[0009] Unfortunately, these hinged and/or geared mechanisms have proven to be relatively expensive for a production at industrial level. Further, they are relatively complex to install on the appliance with a remarkable waste of time and labour.

[0010] The main aim of the present invention is to provide a fixing device for the decorative panel of a household appliance, in particular a dishwasher, which allows the overcoming of the above mentioned drawbacks.

[0011] Within this aim, it is an object of the present invention to provide a fixing device, which allows the door panel of the household appliance to move according to a translational trajectory.

[0012] It is an object of the present invention to provide a door-panel fixing device, which has a simple structure

and which is easy to be installed on a household appliance.

[0013] It is also an object of the present invention to provide a door fixing device, which is easy to manufacture at industrial level, at competitive costs.

[0014] Thus, the present invention provides a door-panel fixing device for a household appliance, according to the attached claims.

[0015] The fixing device according to the invention comprises a sliding mechanism, to which the aesthetic/decorative door panel is connected and that is mounted on the inner door of the appliance, and preferably an additional contact part which is solidly connected to the aesthetic panel. The contact part is useful to protect the door panel from damages when coming in contact with the lower structure of the appliance.

[0016] Said sliding means are arranged to force the door to move according to a translational trajectory with respect to the main body of the appliance.

[0017] It is therefore possible to install longer decorative panels on the door and reduce the height of the plinth.

[0018] The appliance structure can thus be arranged with less severe constraints, thereby obtaining an improved and easier integration with the surrounding furniture, with considerable advantages from the ergonomic and aesthetic point of view.

[0019] The fixing device, according to the invention, has a simple and robust structure and it is quite easy to manufacture and install at industrial level.

[0020] Other features and advantages of the present invention will become readily apparent to the skilled artisan from the following detailed description when read in the light of the accompanying drawings, in which:

- Fig. 1 shows a perspective sight view of the fixing device of the present invention;
- Fig. 2 shows a sectional view along line II-II of figure 1;
- Fig. 3 shows a detail of the lateral view of the installed dishwasher when the decorative panel begins to slide forced by the door opening movement; and
- Fig. 4 shows a frontal view of a dishwasher door wherein four fixing devices according to the present invention are mounted on the appliance door.

[0021] With reference to the drawings, a built-in dishwasher DW to be installed into a modular kitchen presents a door D for closing and sealing from the outside the cavity in which the kitchenware is washed. The outer surface of the dishwasher presents a control panel CPN, which is not present for the models in which the controls are placed inside the machine, and a raw surface RS on which is applied a decorative panel DP that matches the aesthetics of the modular kitchen. In order to fix the decorative panel on the portion of the door, four seats SL in the proximities of the four corners of the door D are embedded with the door. Near each of the seats SL the door is provided with lateral openings for accessing to secure

with screws or similar devices the fixing devices FD connected with the decorative panel DP, to the door D.

[0022] The decorative panel DP to be installed is preferably prepared with the application of four identical fixing devices FD according to the present invention, even if a lower number of devices FD can be used.

[0023] In a preferred embodiment, each of the fixing devices FD presents a housing H preferably made of plastic material, in particular POM (Polyoximethylene), and is provided with a rectangular box shape. The housing H contains a shaft SH which is arranged along the longitudinal dimension of the housing. A spring SP is slidably associated with the shaft SH, arranged between a wall of the housing to which the shaft is connected, and a sliding block SB which is also slidably associated with the shaft. The shaft SH is connected to the opposite walls of the housing. The spring force is useful to ensure a smooth sliding movements of the decorative panel and to avoid any blocking of the mechanism caused by frictions, due for instance to misalignments of the mounted panel. The device FD itself can work without the springs due to the gravity force of the decorative panel DP, when connected to the door D, even if the use of a spring is preferred.

[0024] The slidable block SB is provided with a flat portion FP which is planar with the rectangular opening of the housing H in which it slides. On the flat portion FP four bores M are disposed through which four screws passes for coupling the slidable block SB to the decorative panel DP. Instead of the four bores M, the flat portion of the slidable block can present different coupling means M for connecting the panel DP is compatible with the present invention.

[0025] On the opposite side of the flat surface of the slidable block, the housing H presents a rear opening RO for accessing with a tool (for instance a screwdriver) to screw/drill screws into the decorative panel DP during the installation.

[0026] The housing H of the fixing device FD presents door securing means DMS for securing the housing to the door, when fitted into the seats SL of the door D, for instance a threaded hole. These means DMS are preferably embedded with the housing H. Optionally, some contact parts CP, for instance made of low friction plastics, are applied to the lower portion of the decorative panel and glued or fixed with screws to the same panel.

[0027] The shape of the housing H can be different from rectangular, but must always include a shaft SH with an elongated shape.

[0028] During the installation of the dishwasher into a modular kitchen, the decorative panel, which is mostly made of wood, is prepared for the installation by fixing the fixing devices FD to the back side of the panel by means of screws with the aim to have the best alignment of the decorative panel with the kitchen furniture when the door is closed. More specifically, their positions are determined by means of measures or by the use of specific dimes. The fixing devices are disposed with their

longitudinal direction according to the vertical direction of the panel disposing their slidable blocks in the lower side of the decorative panel, as described in Fig. 4.

[0029] After being positioned with their flat portion in contact with the decorative panel, each fixing FD device is fixed to the same panel DP by means of the coupling means M, for instance by screws threaded to the decorative panels which pass through the bores M. There is easy access to the screws thanks to the rear opening RO provided with the housing H.

[0030] When the devices FD have been connected, the decorative panel DP is mounted on the dishwashing door D by inserting the housings of the fixing device into the corresponding door slots SL. Each fixing device FD is then secured to the door D by means of screws or the like, inserted from the lateral side of the door D and coupled with door securing means DSM of the fixing device FD. In this way also the decorative panel DP is slidably coupled to the dishwashing door D. Once installed, the decorative panel on the closed door is in its lower position and matches the design lines of the surrounding furniture. As shown in Fig. 3, when the door is opened, the door and the decorative panel DP starts to rotate around the door hinge. When during the opening movement the contact part CP starts abutting the lower portion of the washing machine, the decorative panel starts to slide toward an upper position, allowing to the door to be opened without interference. The optional contact parts CP are mounted on the area of the decorative panel DP which first enters in contact with the lower portion of the appliance, when the door is opened.

[0031] When the dishwashing door is then closed, at least for the effect of the gravity, the decorative panel slides back to its lower position. The fixing device FD of the present invention allows using long decorative panels DP to cover the anti-esthetical portions of the washing machine in its lower part, and to easily open frontally the door for loading or unloading the washing machine.

[0032] As shown in Fig. 1 when a spring is included into the fixing device, smooth movements of the sliding mechanism, are obtained especially when frictions are present, for instance caused by a not perfect aligned panel DP installation. The smooth movement is obtained because the springs SP forces the sliding block towards the one end portion E of the shaft SH and causing the contact part CP to remain in contact with the lower portion of the washing machine.

[0033] A second spring (not shown) can also be inserted in the shaft SH between the slidable block and the connection of the shaft to the housing, in order to further render smooth the movements.

[0034] For sake of completeness, there exist other possible configurations for the fixing device FD of the present invention to slidably connect the decorative panels to the appliance door. For instance, one of these configurations includes one or two devices FD of the present invention in combination with one or more other known sliding devices applicable to the decorative panels, such

as slidable hooks. All these equivalent configurations are considered within the scope of the present invention.

[0035] It has been so disclosed a cheap device, easy to be installed that provides a versatile installation of the decorative panel.

[0036] It has been also disclosed a cheap configuration of the door of a built in appliance which is adapted to match several possible configurations of the surrounding furniture by a translational movement of the decorative panel.

Claims

1. Device (FD) for fixing a decorative panel (DP) on a door (D), particularly a door of a built in appliance such as a dishwasher, comprising: an housing (H) suitable to be fitted and secured to said door (D), a shaft (SH) longitudinally arranged into said housing (H), a slidable element (SB) mounted on said shaft (SH), said slidable element (SB) being suitable to be connected with the decorative panel (DP), the fixing device providing a slidable configuration of the decorative panel (DP) with the door (D) in the direction of the shaft (SH) when the slidable element (SB) is connected to decorative panel (DP) and the housing (H) is fixed to the door (D).

2. Device for fixing a decorative panel on a door according to claim 1 further comprising a spring (SP) mounted on said shaft (SH), said spring (SP) being suitable to force said slidable element (SB) towards one end portion (E) of the shaft (SH).

3. Device for fixing a decorative panel on a door according to any of the proceeding claims wherein a second spring is mounted on the shaft (SH) between said end portion of the shaft (SH) and the slidable element (SB).

4. Device for fixing a decorative panel on a door according to any of the proceeding claims wherein said housing (H) presents a rear opening (RO).

5. Device for fixing a decorative panel on a door according to any of the proceeding claims wherein the slidable element further comprises a flat portion (FP) presenting coupling means (M) for fixing the decorative panel (DP)

6. Device for fixing a decorative panel on a door according to any of the proceeding claims wherein the housing (H) further comprises door securing means (DSM),

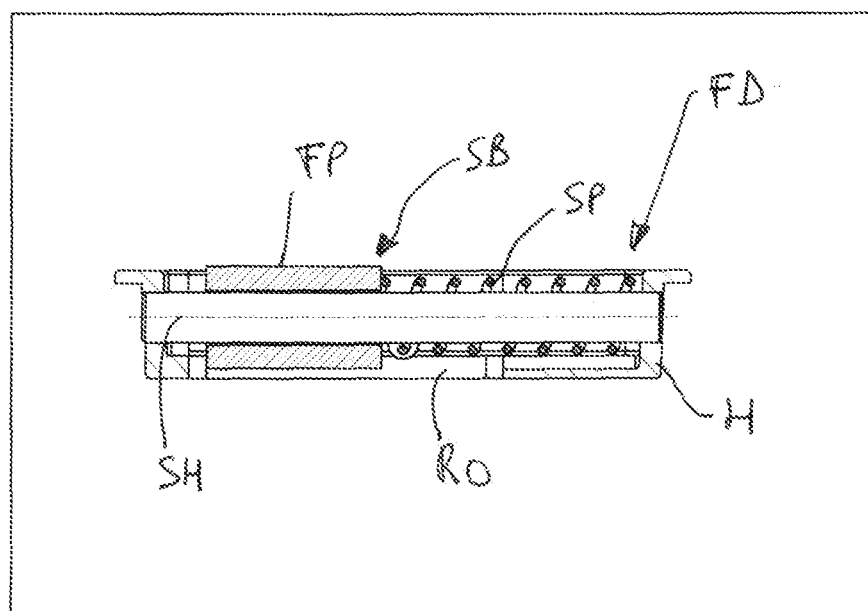
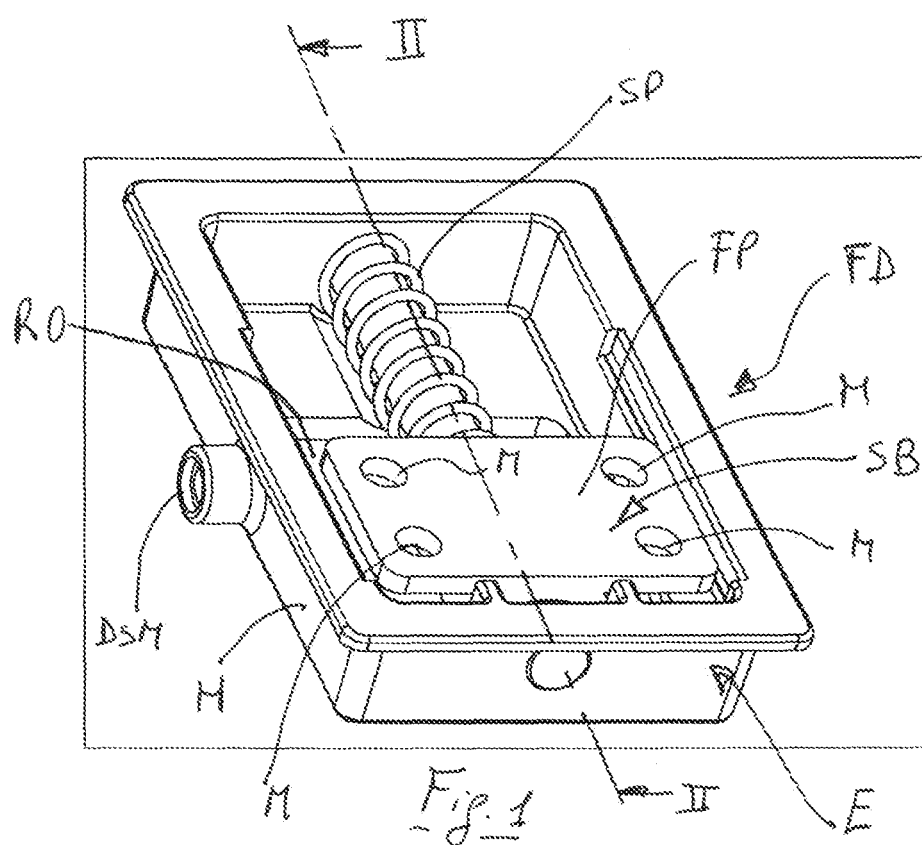
7. Appliance provided with a decorative panel (DP) slidable with an appliance door (D) **characterized in that** it comprises devices according to claim 1 for

fixing the decorative panel on the door (D).

8. Appliance according to claim 7 further comprising a contact part (CP), said part (CP) being coupled with a portion of the decorative panel (DP), said contact part (CP) being the first contact point of the decorative panel (DP) with the appliance, when the door is in its open configuration.

9. Appliance according to claims 7 or 8, wherein the fixing devices are positioned in order to have the shaft arranged according to a vertical position of the door (D).

10. Appliance according to any of the claims 7 to 9, wherein the decorative panel is adapted to abut a body structure of the appliance, in the open configuration of the door, at least a couple of fixing devices allowing a sliding movement of the decorative panel (DP) following a further rotation of the door (D).



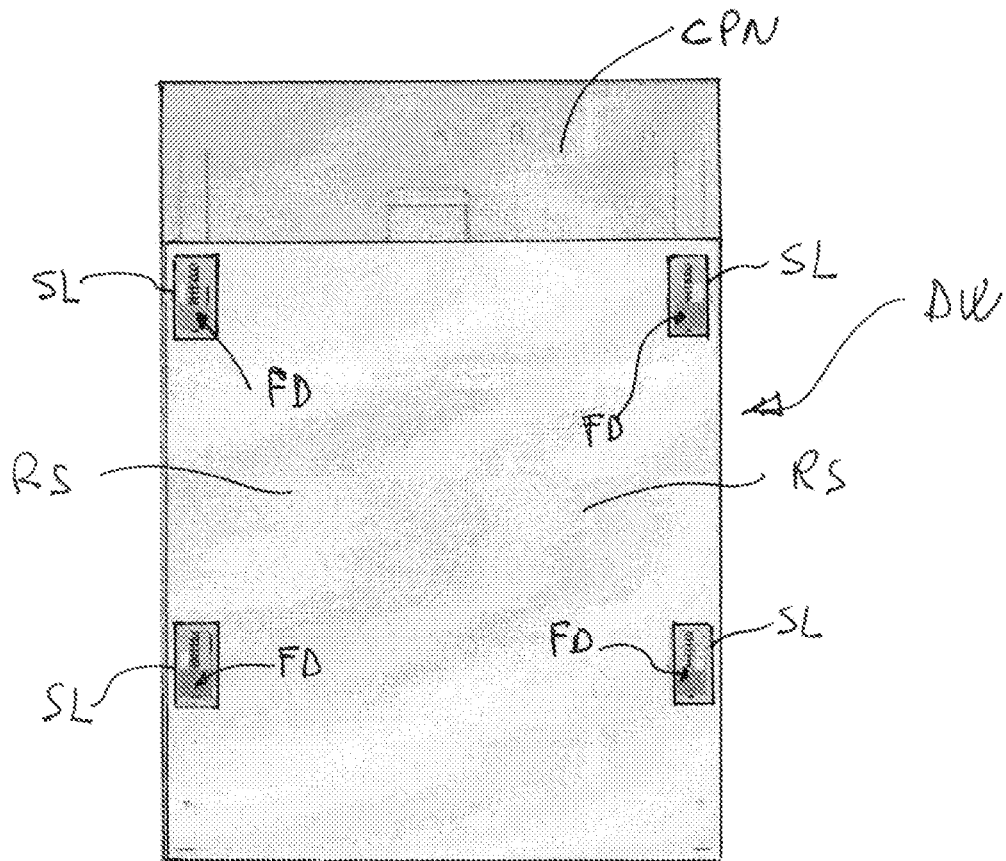
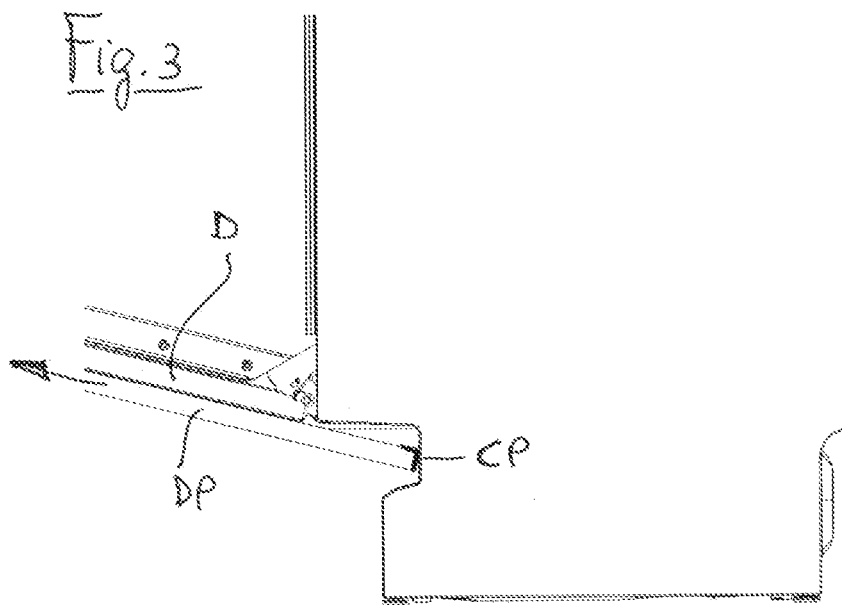


Fig.4



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Place of search Munich		Date of completion of the search 2 September 2008	Examiner Fachin, Fabiano
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			

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