



(11) **EP 2 357 302 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.08.2011 Bulletin 2011/33

(51) Int Cl.:
E05B 1/00 (2006.01) F25D 23/02 (2006.01)

(21) Application number: **11154570.3**

(22) Date of filing: **15.02.2011**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

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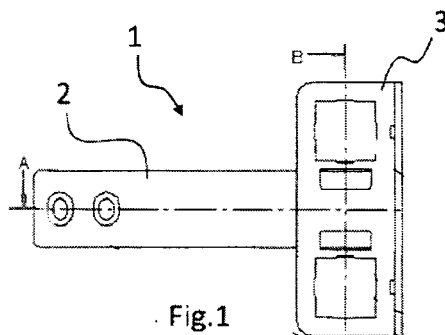
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(30) Priority: **17.02.2010 IT TO20100119**

(54) **Grip device for a door of a household appliance, and household appliance fitted with such a device**

(57) The present invention relates to a grip device (1,10) for doors (5) of household appliances, which com-

prises at least one magnet (7) for securing said grip device (1,10) to said door (5).



Description

[0001] The present invention relates to a grip device for a door of a household appliance, such as a refrigerator, a refrigerator-freezer, a dishwasher, a washing machine or the like. Household appliances can be subdivided into two main categories, i.e. undercounter units and free-standing units.

[0002] The difference between the two is essentially that the former are prearranged for being installed inside suitable recesses in kitchen cabinets, and are hidden by panels (usually having the same style and colour of the other kitchen cabinets), whereas the latter, once installed, stay uncovered by any panels.

[0003] In general, the above-described household appliances have an access opening through which it is possible to reach an inner operational space, e.g. the drum of a washing machine, the tub of a dishwasher, or the refrigerated cells of refrigerators and refrigerator-freezers.

[0004] Said openings are usually closed by a door fitted with a grip device through which the door can be put into the closed or open condition.

[0005] In free-standing household appliances, the grip device is a handle of the type suitable for being gripped by a user, which handle is secured to the door by means of screws, bolts or the like.

[0006] In undercounter household appliances, the situation is different and more complex, in that in this case the door is coupled to a cover panel which can be moved together with the door itself.

[0007] Normally both the door and the cover panel are hinged, the former to the appliance itself and the latter to the cabinet that houses the appliance.

[0008] Therefore, the hinges of the door and those of the cover panel do not coincide, with the result that, in order to couple the two elements together, a door grip device is usually provided which couples the door to its cover panel, the latter, in turn, includes a handle adapted to be gripped by a user.

[0009] In these cases, the door grip device typically consists of a rail and female guide respectively secured to the door and to the cover panel, and adapted to slidably engage with each other so as to allow for the simultaneous rotation of both the door and the cover panel on the respective hinges.

[0010] The rail and the female guide are fastened to the door and to the cover panel, respectively, by means of screws or bolts or the like.

[0011] It should also be considered that these household appliances are often fitted on both sides with vertical-axis hinges, which allow the door to be hinged on the right or on the left: in certain installation conditions, in fact, the available room may make it preferable to choose this second option.

[0012] Of course, moving the hinges from the right to the left implies that the door grip device must be moved as well in order to be able to provide its function, with the

result that, should conditions arise in the course of the service life of the household appliance that require the hinges to be moved (e.g. because the owner has moved to a new house or the like), it will be necessary to make new holes in the door to secure the grip device in the new position.

[0013] Another drawback is that the two grip devices (for undercounter and free-standing household appliances) are not easily interchangeable: in fact, in order to do this work it is necessary to unscrew the screws or bolts, drill new holes and fasten the new grip device, so that the old holes will remain visible.

[0014] Moreover, it is not always appropriate to drill holes in the door of a household appliance; for instance, in a refrigerator or a refrigerator-freezer this could impair thermal insulation, while in a washing machine or a dishwasher it could compromise the water tightness of the door, thus adversely affecting the operation of the appliance itself.

[0015] Yet another drawback, which is particularly perceived in undercounter household appliances, relates to the fact that the grip device, i.e. the rail and the guide, must be positioned very accurately on the door and on the cover panel to avoid that a mutual offset may adversely affect the simultaneous opening or closing rotation of both: as can be intuitively understood, the rotation of the door and of the panel coupled through different hinges having non-matching axes involves a relative movement between the two which must be taken into account when mounting the rail and the guide, and therefore requires a relatively time-consuming and accurate installation.

[0016] The present invention relates to a grip device for doors of household appliances and to a household appliance fitted with such a device, which can overcome these and other drawbacks.

[0017] It is one object of the present invention to provide a grip device for doors of household appliances according to claim 1.

[0018] It is another object of the present invention to provide a household appliance fitted with such a grip device.

[0019] The idea at the basis of the present invention is to secure the grip device by means of a magnet, thus avoiding drilling holes in the panel or in the door.

[0020] The magnetic fixing also allows the rail and the guide to be positioned in a simpler and quicker manner, with the possibility of making small corrections and adjustments without having to drill any holes in the door.

[0021] This solution also makes the household appliances more versatile, since the grip devices can be interchanged without having to drill holes in the door.

[0022] Further advantageous features of the invention will be set out in the appended claims. These features as well as further advantages of the present invention will become apparent from the following description of an embodiment thereof as shown in the annexed drawings, which are supplied by way of non-limiting example,

wherein:

Fig. 1 is a plan view of a first type of grip device according to the present invention;

Fig. 2 shows the device of Fig. 1 according to section BB;

Fig. 3A shows the device of Fig. 1 according to section AA;

Fig. 3B shows the device of Fig. 1 according to section AA, in accordance with an advantageous variant of the present invention;

Fig. 4 shows a second type of grip device;

Fig. 5 shows a different view of the device of Fig. 4.

[0023] Referring now to Figs. 1, 2, 3A and 3B, there are shown two embodiments of the grip device 1.

[0024] This is of the type suitable for being mounted to a door of an undercounter household appliance (as defined in the above discussion, to which reference should be made for further details).

[0025] In the example shown, the household appliance is a cooling appliance, such as a refrigerator or a refrigerator-freezer, fitted with refrigerated compartments closed by a door 5 rotatable about vertical-axis hinges.

[0026] On the door 5 there is a cover panel 4, which is also rotatable together with the door 5 about similar vertical-axis hinges.

[0027] The hinges of the panel 4 and of the door 5 however do not have coinciding axes, because the former is rotatably associated with the kitchen cabinet providing the recess in which the household appliance is placed, whereas the door 5 of the latter is rotatably associated with the side walls of the household appliance itself, so that during the rotational motion of both elements about the hinges' vertical axes there is also some relative sliding therebetween.

[0028] The user opens or closes the door by acting upon the cover panel 4, which for this purpose is fitted with a handle (not shown because per se known).

[0029] In order to cause the user's action upon the panel 4 to drag open the door 5 as well, and to comply with the mutual sliding motion mentioned above, it is necessary that between the two there are suitable grip means 1.

[0030] These comprise for this purpose a rail 2 and a guide 3 that embraces the rail 2 in a manner such as to be able to slide relative thereto.

[0031] The guide 3 comprises two L-shaped profiles 20 housed in corresponding undercuts of the rail 2, as shown in Fig. 2; the guide 3 is associated with the door 5 of the household appliance by means of magnets 7.

[0032] The symmetrical shape of the guide 3 with respect to the rail 2 ensures optimal load distribution.

[0033] Also the arrangement of the magnets on the guide 3 is symmetrical with respect to the rail 2.

[0034] To this end, the entire door 5 or at least a portion thereof is metallic, so that the magnets can properly adhere thereto.

[0035] The rail 2 is typically fastened by means of

screws to the panel 4, which is usually made of wood.

[0036] If the panel 4 is made of metal or includes any metal surfaces, it is conceivable to secure thereto the rail 2 by means of magnets as well.

[0037] During the opening movement, the guide 3 slides along the rail 2, and the presence of the L-shaped profiles 20 engaged with the respective undercut allows the force exerted by the user on the panel 4 to be transferred to the door 5, which is thus rotatably dragged together with the panel (which completes the step of opening or closing the door).

[0038] The presence of the magnets 7 advantageously implies that it is not necessary to drill any holes in the door 5 and that during the assembly process the guide 3 can be positioned accurately without requiring drilling additional holes for making any position corrections. As shown in Fig. 3A, the guide 3 is mounted in a fixed position to the end of the door 5, at the edge thereof.

[0039] In order to prevent the guide 3 from moving, it comprises a bent edge 8 arranged perpendicularly to the guide body fitted with the L-shaped profiles 20.

[0040] In the assembled condition, said bent edge 8 arranges itself around the free edge of the door, so as to prevent the guide 3 from moving relative to the door 5 when the door is opening and closing.

[0041] The bent edge 8 is made of plastic and its "L" shape ensures structural stability which prevents the guide 3 from being deformed by the force exerted by the magnets.

[0042] The combination of the bent edge 8 and the magnets 7 therefore allows obtaining a simple but stable coupling between the guide 3 and the door 5, without however requiring the use of excessively big magnets 7 and without having to drill the door 5.

[0043] Of course, in the event that during the life of the household appliance the guide 3 should be repositioned (e.g. due to the necessity of opening the door on the right or on the left or to any in-process changes), this can be done without having to drill the door by simply moving the guide 3.

[0044] Mounting the rail 2 onto the panel 4 may be facilitated by prearranging on one end of the rail 2 an extension 9 (shown in the variant of Fig. 3B and manufactured, for example, in one piece with the rail 2, the extension 9 having preferably a smaller cross-section than the remaining portion of the rail 2), which ends flush with the lateral edge 40 of the panel 4 so that, when the panel 4 is closed, the extension 9 is hidden from view and does not ruin the appearance of the panel 4. As an alternative, the extension 9 may end with a tooth (not shown) which meets the lateral edge 40 of the cover panel 4 and, when the door is closed, is arranged at about 90° to the latter.

[0045] The extension 9 is adapted to ensure the correct and univocal mounting of the rail 2 to the lateral edge 40 of the panel 4, and is preferably made in one piece with the rail 2.

[0046] The extension 9 also provides the advantage

of acting as a shock absorber between the panel 4 and the side 80 of the cabinet, damping the stresses generated as the panel 4 hits the side 80 when the door 5 is closed and preventing the panel 4 and/or the side 80 from suffering possible damage. To this end, the extension 9 may comprise, on the surface thereof facing the side 80, a damping projection 90 as shown in Fig. 3B which, when the door 5 is closed, hits the side 80; said projection is made of a material such that any damage to the side 80 due to this impact is avoided.

[0047] This ensures the optimal distance between the rail 2 and the edge of the panel 4.

[0048] As to the example shown in Figs. 4 and 5, it shows a grip device 10 for a free-standing household appliance.

[0049] In this embodiment, the grip device 10 is a cylindrical-symmetry knob fitted with a magnet 7 adapted to be placed in contact with the door of the household appliance, which is, similarly to the above, metallic or includes metallic parts that allow the magnet to firmly adhere thereto.

[0050] In addition to the magnet 7, the device 10 comprises a body portion 11 adapted to be gripped by the user and having an inner threaded collar 12.

[0051] In its turn, the magnet 7 has an axial extension 15 ending with a thread that engages with that of the collar 12, so as to make the body 11 and the magnet 7 integral with each other.

[0052] The threaded collar 12 may alternatively be replaced with a nut screwed onto the threaded end of the axial extension 15 of the magnet 7; in this latter case, the body 11 can be divided into two parts to allow screwing the nut.

[0053] Of course, although the above-described example has shown a grip device 10 made in the form of a knob, it is understood that the teaching at the basis of the present invention may also be used for grip devices having different shapes, e.g. like a traditional handle or otherwise.

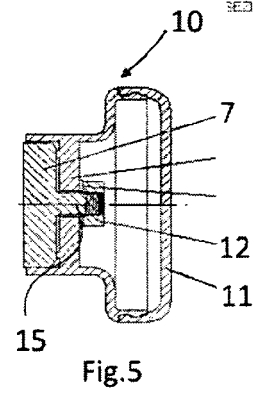
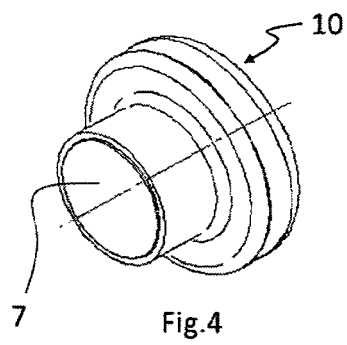
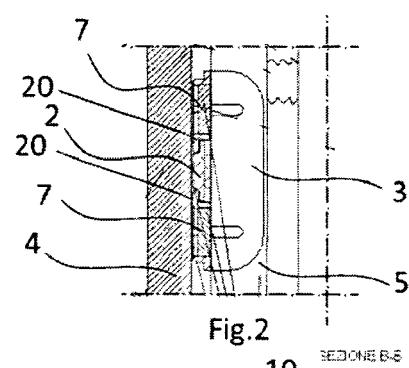
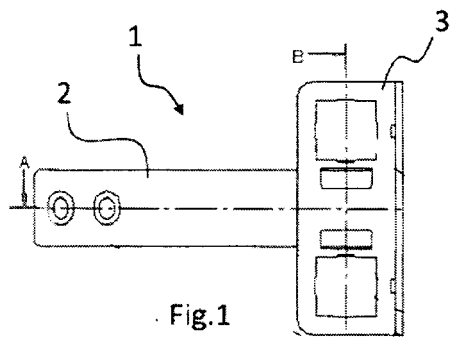
[0054] As regards the magnets 7, it should be noted that their dimensions or type are proportional to the force exerted on the door. For example, for the present invention one may use a flat-base neodymium supermagnet having a diameter greater than 32 mm and a thickness of approximately 7 mm.

[0055] At any rate, it is appropriate that the magnets 7 are sized so as to resist the stresses that they must undergo in the household appliance where they are to be installed. Advantageously, one may use magnets having a traction force approximately greater than 18 kg.

[0056] For example, if they are to be mounted in a refrigerating apparatus, it is necessary to take into account that opening the door requires a certain force, and therefore, to prevent the magnet 7 from coming off, the force exerted by the magnet 7 will have to be greater than the force necessary for opening the door.

Claims

1. A grip device (1,10) for doors (5) of household appliances,
characterised in that
it comprises at least one magnet (7) for securing said grip device (1,10) to said door (5).
2. Device according to claim 1, comprising a rail (2) and a guide (3) which slideably engages onto said rail (2).
3. Device according to claim 2, wherein said guide (3) comprises at least one magnet (7) adapted to be secured to said door (5).
4. Device according to claim 2 or 3, wherein said guide (3) comprises at least one L-shaped profile (20), and wherein said rail (2) comprises at least one undercut, said profile (20) and said undercut being adapted to engage with each other.
5. Device according to one or more of claims 2 to 4, wherein said guide (3) comprises a bent edge (8) arranged perpendicularly to the guide body.
6. Device according to one or more of claims 2 to 4, wherein one end of said rail (2) has an extension extending past the region where the rail (2) engages with the guide (3), said extension being preferably manufactured in one piece with said rail (2).
7. Device according to one or more of the preceding claims, comprising a body portion (11) suitable for being gripped by the user and adapted to be secured to said magnet (7).
8. Device according to claim 7, wherein said magnet (7) comprises an axial extension (15) ending with a thread to be screwed into said body portion (11).
9. Device according to one or more of the preceding claims, wherein said magnet (7) is a magnet having a traction force approximately greater than 18 kg.
10. A household appliance, in particular a refrigerating appliance such as a refrigerator or a refrigerator-freezer, comprising at least one compartment closed by a door (5), wherein said door (5) can be moved in order to open or close said compartment by acting upon a grip device according to one or more of the preceding claims.



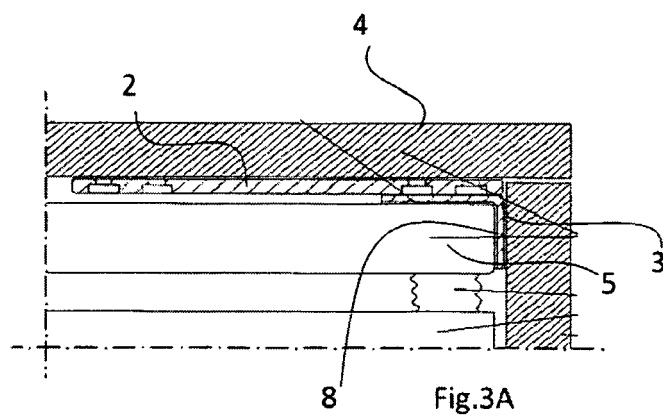


Fig.3A

SEZIONE A-A

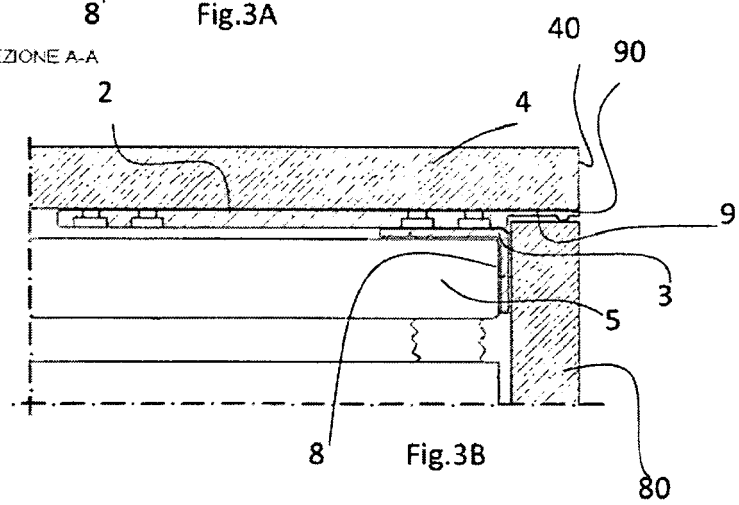


Fig.3B