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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Device for fixing a built-in electric household appliance inside the associated compartment of a furniture unit

(57) Device for fixing an electric household appliance (1) of the type in which at least two walls (3, 4) which are parallel to each other define a transverse dimension of the appliance, inside an associated compartment (2) of a furniture unit defined by at least two opposite walls (5, 6) parallel to each other and separated by a distance substantially equal to or greater than the transverse dimension of the electric household appliance (1) to be mounted inside. The device comprises:

- a first part (7) fixed to each of the walls (3, 4) of the electric household appliance (1) and projecting from the latter towards the outside of the said appliance;
- a second part (11) fixed to each of the walls (5, 6) of

the compartment (2) of the furniture unit which are situated opposite those of the electric household appliance on which the said first part is mounted, when inserted inside the compartment, said second part (11) being directed towards the inside of the compartment (2);

- said first and second parts (7, 11) snap-engaging together resiliently in the direction of insertion of the electric household appliance (1) inside the compartment (2);
- said first and second parts (7, 11) being fixed onto the respective walls of the electric household appliance (1) and the compartment (2) of the furniture unit in positions such as to be stably engaged together when the electric household appliance (1) is completely and correctly inserted inside the compartment (2).

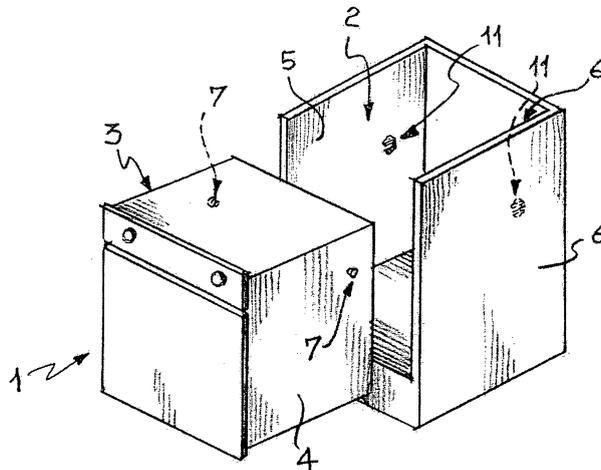


Fig-1

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Description

[0001] The present invention relates to a device for fixing an electric household appliance of the type in which at least two walls which are parallel to each other define a transverse dimension of the appliance, inside an associated compartment of a furniture unit defined by at least two opposite walls parallel to each other and separated by a distance substantially equal to or greater than the transverse dimension of the electric household appliance to be mounted inside.

[0002] In particular, although not exclusively, the device may be used when fixing ovens and dishwashers inside the respective compartments of kitchen furniture units.

[0003] In accordance with the known art, fixing of an electric household appliance of the type indicated above is performed by sliding the appliance inside the compartment of the furniture unit until it reaches the end position. At this point the appliance is fixed to the side walls of the compartment in the furniture unit by means of a plurality of self-tapping screws frontally inserted through the surrounding part of the frame of the appliance.

[0004] These screws, apart from having a negative aesthetic impact, since the associated heads are visible upon opening the door of the electric household appliance, do not allow installation in a practical and durable manner.

[0005] In fact insertion of the screws is performed in substantially "blind" conditions, without the certainty that they are inserted correctly into the thickness of the wall of the furniture compartment, more often than not damaging the furniture unit itself and in any case without ensuring firm and permanent fixing.

[0006] Moreover, since in most cases the walls of the compartments of the furniture units are made of chipboard or the like, the use of self-tapping screws does not ensure a uniform degree of fixing tightness in the event of repeated assembly and disassembly since the gripping force of the screws, acting inside the same holes, diminishes with time.

[0007] The object of the present invention is therefore to propose a device for fixing built-in electric household appliances inside the associated compartments of a furniture unit, which is able to overcome the drawbacks encountered in relation to the prior art described above.

[0008] The object is achieved by the device according to the invention as described in Claim 1 below.

[0009] The invention will now be described in greater detail with reference to some preferred examples of embodiment, provided solely by way of a non-limiting example and illustrated in the accompanying drawings in which:

- Figure 1 shows a schematic and perspective view of an electric household appliance such as an oven or a dishwasher, together with the respective compartment of a furniture unit inside which it must be

inserted and housed;

- Figure 2 shows a schematic and perspective view, on a larger scale, of a pair of parts for fixing the electric household appliance inside the associated compartment, in their embodiment shown in Figure 1;
- Figure 3 shows a schematic and perspective view of an electric household appliance, such as an oven or a dishwasher, together with the associated compartment of a furniture unit inside which it must be inserted and housed, using the fixing parts designed in accordance with a second embodiment;
- Figure 4 shows a cross-section through a zone for fixing the electric household appliance to the compartment of the furniture unit, after fixing has been performed using the parts designed in accordance with the embodiment of Figure 3, together with a tool able to achieve disengagement of the fixing system;
- Figure 5 shows a schematic and perspective view of a further embodiment of one of the parts for fixing the electric household appliance to the wall of the furniture unit compartment.

[0010] With reference to the abovementioned figures and in particular to Figures 1 and 2, 1 denotes overall an electric household appliance, such as, for example, an oven or a dishwasher, to be mounted fitted inside a compartment 2 of a kitchen furniture unit, not shown in its entirety in that it is conventional.

[0011] The electric household appliance 1 is of the type provided with opposite parallel vertical walls 3 and 4 which are intended to be positioned adjacent to corresponding walls 5 and 6 of the compartment 2.

[0012] In accordance with the present invention, each of the walls 3 and 4 of the electric household appliance 1 has, fixed thereto, a first fixing part 7 which, in the embodiment of Figures 1 and 3, is in the form of a pin 8 with associated support base 9. Mounting of the part 7 on the walls 3 and 4 is performed, for example, by means of a screw 10 which may also be of the self-tapping type.

[0013] Still in accordance with the present invention, a second fixing part, denoted overall by 11, is mounted on each of the walls 5 and 6 of the compartment 2. In the embodiment according to Figures 1 and 2, the part 11 comprises a C-shaped support 12 with a transverse core 13 and flanges 14. A pair of resilient arms 15 and 16 extends from the transverse core 13 in the opposite direction to the latter. These arms define a gripping member with an opening 17 through which the rigid pin 8 passes during insertion of the electric household appliance and a rear-lying zone 18 for stably housing the pin once the appliance is correctly and completely snap-engaged inside the compartment 2.

[0014] Consequently, when positioning the fixing part 7 on the side walls 3 and 4 of the electric household

appliance 1 and positioning the corresponding second fixing part 11 on the walls 5 and 6 of the compartment 2, it is necessary to take into account the overall depthwise dimensions of the electric household appliance 1 and the position which it must assume inside the compartment 2.

[0015] With reference to Figure 2, it can be seen that the free ends of the arms 15 and 16 have a portion 19 which is splayed with respect to the direction of insertion of the pin 8, said splayed portion forming a receiving section for insertion of the pin and defining a passage 20 with a narrow cross-section.

[0016] Once the pin 8 has reached the zone 18, its removal in the opposite direction which would allow extraction of the electric household appliance 1 out of the compartment 2 is prevented, unless an extraction force such as to cause splaying of the arms 15 and 16 is exerted on the appliance.

[0017] Mounting of the fixing part 11 on the walls 5 and 6 of the compartment 2 may be performed by means of screws 21, 22 which may be of the self-tapping type and which engage in the walls 5 and 6, passing through respective holes 23 and 24 formed in the lugs 25 and 26 integral with the flanges 14 of the support 12.

[0018] With reference to Figure 3, it can be seen that the fixing device according to the invention, in a different embodiment thereof, comprises a first part consisting of a resiliently flexible plate 27 projecting from the walls 3 and 4, while the second part consists of a locating stop 28 fixed to each of the walls 5 and 6 of the compartment 2. The resiliently flexible plate 27, while it allows snap-engagement of the electric household appliance 1 inside the compartment 2, after passing over the stop 28 at the end of the insertion, with its end portion 27a, ensures the stable positioning thereof engaging with the latter, as can be seen from the cross-section shown in Figure 4.

[0019] The plate 27 preferably is in the form of a cam structure with a contrasting action on the side of the end portion 27a.

[0020] As an alternative to a structure mounted on the outside of the walls of the electric household appliance, the plate 27 with its end portion 27a may be replaced by a corresponding shaped part formed by means of drawing of a portion of the corresponding wall of the electric household appliance, making sure that no undesirable openings are formed in the said wall.

[0021] The stop 28, in the embodiment shown in Figure 3, consists of the free edge of a flange 29 folded towards the inside of the compartment 2 and formed, in a conventional manner, by means of incision of a window 30 in a plate 31 which is fixed to the associated wall by means of removable fixing means, for example screws.

[0022] Once inserted inside the compartment 2, the electric household appliance 1 may be removed and extracted from the compartment by means of insertion of a tool, for example a screwdriver 32 shown in Figure 4, through a hole 33 provided in the surrounding part 34 of the electric household appliance 1, which is envisaged conventionally to make contact against the walls 5 and

6 of the compartment 2.

[0023] Since the hole 33 is in alignment with the resiliently flexible plate 27, using the tip of the tool 32 it is possible to bend either the plate 27 or the flange 29 and cause relative disengagement of the end portion 27a and the stop 28, which allows extraction of the electric household appliance 1 without having to perform the removal of screws.

[0024] With reference to Figure 5 it can be seen that the flange 29 of the embodiment according to Figure 3 is replaced by the flange 35 which is the folded terminal part of a plate 36.

[0025] The locating stop in this embodiment therefore consists of the free edge 37 of the flange 35.

[0026] From that described above it is clear that, by means of the fixing device according to the invention, a built-in electric household appliance may be inserted inside the associated compartment of a kitchen furniture unit, with the possibility of performing extraction thereof, even several times, without the risk of damaging the fixing parts which always remain in position mounted on the respective walls.

[0027] The dimensions as well as the materials may be of any nature according to requirements without thereby departing from the scope of the invention as described above and claimed below.

Claims

1. Device for fixing an electric household appliance (1) of the type in which at least two walls (3, 4) which are parallel to each other define a transverse dimension of the appliance, inside an associated compartment (2) of a furniture unit defined by at least two opposite walls (5, 6) parallel to each other and separated by a distance substantially equal to or greater than the transverse dimension of the electric household appliance (1) to be mounted inside, **characterized in that** it comprises:

- a first part (7) fixed to each of the walls (3, 4) of the electric household appliance (1) and projecting from the latter towards the outside of the said appliance;
- a second part (11) fixed to each of the walls (5, 6) of the compartment (2) of the furniture unit which are situated opposite those of the electric household appliance on which the said first part is mounted, when inserted inside the compartment, said second part (11) being directed towards the inside of the compartment (2);
- said first and second parts (7, 11) snap-engaging together resiliently in the direction of insertion of the electric household appliance (1) inside the compartment (2);
- said first and second parts (7, 11) being fixed onto the respective walls of the electric house-

- hold appliance (1) and the compartment (2) of the furniture unit in positions such as to be stably engaged together when the electric household appliance (1) is completely and correctly inserted inside the compartment (2).
2. Device according to Claim 1, **characterized in that** said first part (7) and said second part (11) are provided on respective facing walls which define, respectively, the transverse dimension of the electric household appliance (1) and the compartment of the furniture unit (2).
3. Device according to Claims 1 and 2, **characterized in that** the walls on which the said first and second parts are respectively fixed are vertical walls (3, 4) of the electric household appliance (1) and walls (5, 6) of the compartment (2) of the furniture unit, respectively.
4. Device according to Claims 1 to 3, **characterized in that** said first part (7) consists of a rigid pin (8) projecting from the wall on which it is fixed and said second part (11) consists of a resilient gripping member (15, 16), said pin (8) being stably engaged with said gripping member when the electric household appliance (1) is completely inserted inside the said compartment (2).
5. Device according to Claim 4, **characterized in that** said gripping member comprises a support base (12) for fixing to the associated wall (5, 6) and a pair of resilient arms (15, 16) supported by the said base (12), said resilient arms defining an opening (17) through which the said rigid pin (8) passes during insertion of the electric household appliance (1) and a zone (18) for stably housing the pin (8).
6. Device according to Claim 5, **characterized in that** the resilient arms (15, 16) of the said gripping member, at their free ends (19), have a portion splayed with respect to the direction of insertion of the said pin (8), said splayed portion forming a receiving section for insertion of the pin (8).
7. Device according to Claims 1 to 3, **characterized in that** said first part consists of a resiliently flexible plate (27) projecting from the wall (3, 4) to which it is fixed, while said second part consists of a locating stop (28, 37) fixed to the wall (5, 6) of the compartment (2), said resiliently flexible plate (27) engaging with said stop (28, 37) after passing over it at the end of insertion of the electric household appliance (1) inside the compartment (2), resulting in stable positioning thereof.
8. Device according to Claim 7, **characterized in that** said locating stop (28, 37) comprises a plate (31, 36)

fixed to the associated wall (5, 6) by means of removable fixing means.

9. Device according to Claims 1 to 3, **characterized in that** said first part consists of a cam-shaped part formed by means of drawing of the wall of the electric household appliance and projecting from the said wall (3, 4).

Amended claims in accordance with Rule 137(2) EPC.

1. Device for fixing an electric household appliance (1) of the type in which at least two walls (3, 4) which are parallel to each other define a transverse dimension of the appliance, inside an associated compartment (2) of a furniture unit defined by at least two opposite walls (5, 6) parallel to each other and separated by a distance substantially equal to or greater than the transverse dimension of the electric household appliance (1) to be mounted inside, comprising

- a first part (27) fixed to each of the walls (3, 4) of the electric household appliance (1) and projecting from the latter towards the outside of the said appliance;
- a second part (29) fixed to each of the walls (5, 6) of the compartment (2) of the furniture unit which are situated opposite those of the electric household appliance on which the said first part is mounted, when inserted inside the compartment, said second part (29) being directed towards the inside of the compartment (2) ;
- said first and second parts (27, 29) snap-engaging together resiliently in the direction of insertion of the electric household appliance (1) inside the compartment (2);
- said first and second parts (27, 29) being fixed onto the respective walls of the electric household appliance (1) and the compartment (2) of the furniture unit in positions such as to be stably engaged together when the electric household appliance (1) is completely and correctly inserted inside the compartment (2) the walls on which the said first and second parts are respectively fixed being walls (3, 4) of the electric household appliance (1) and walls (5, 6) of the compartment (2) of the furniture unit, respectively,

characterized in that said first part (27) consists of a cam-shaped part formed by means of drawing of the wall of the electric household appliance (1) and projecting from the said wall (3, 4).

2. Device according to Claim 1 **characterized in that** said first part consists of a resiliently flexible plate (27) projecting from the wall (3, 4) to which it

is fixed, while said second part consists of a locating stop (28) fixed to the wall (5, 6) of the compartment (2), said resiliently flexible plate (27) engaging with said stop (28) after passing over it at the end of insertion of the electric household appliance (1) inside the compartment (2), resulting in stable positioning thereof.

3. Device according to Claims 1 and 2, **characterized in that** said locating stop (28) comprises a plate (31) fixed to the associated wall (5, 6) by means of removable fixing means.

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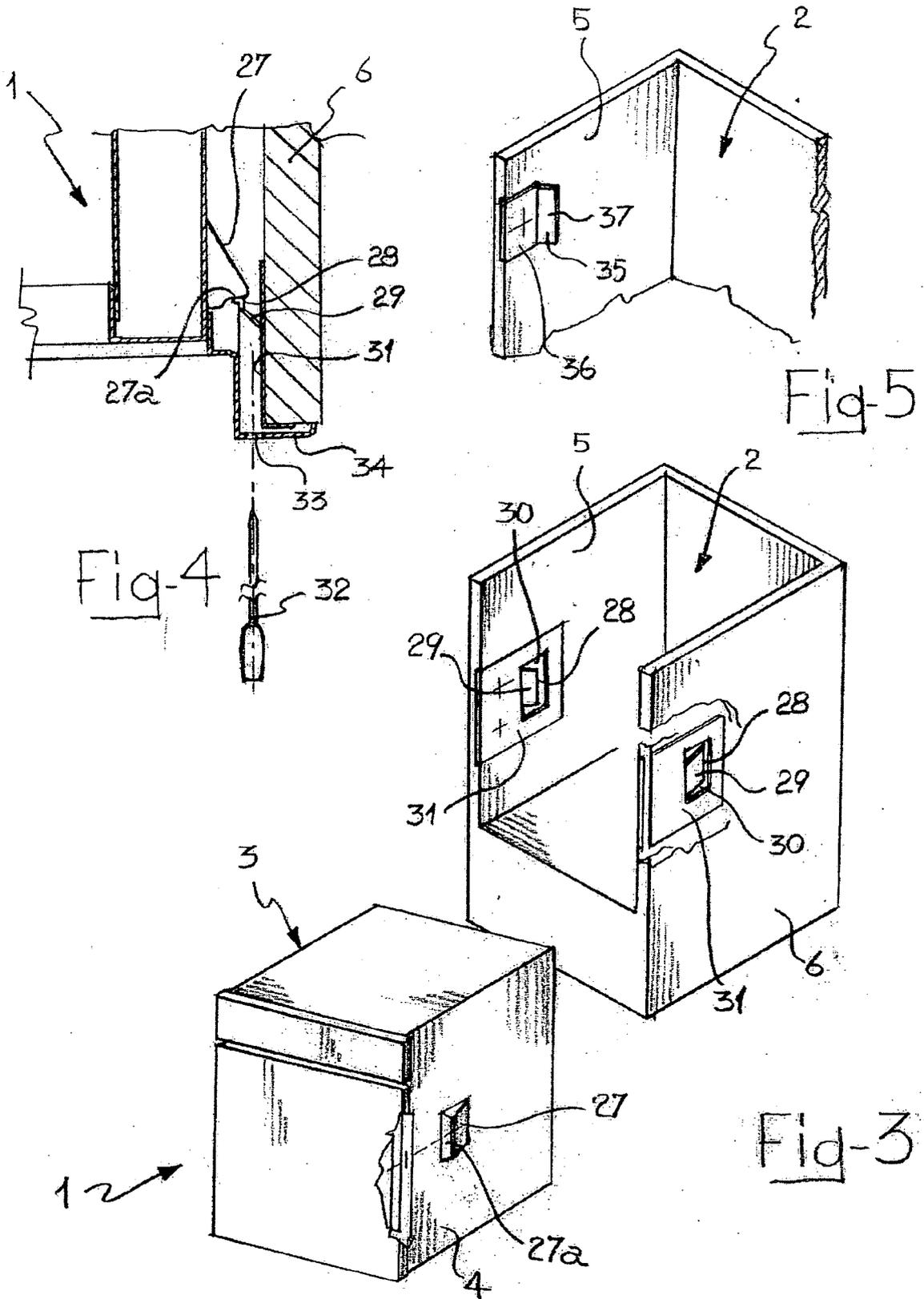
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 January 2007	Examiner Courrier, Gilles
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier 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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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