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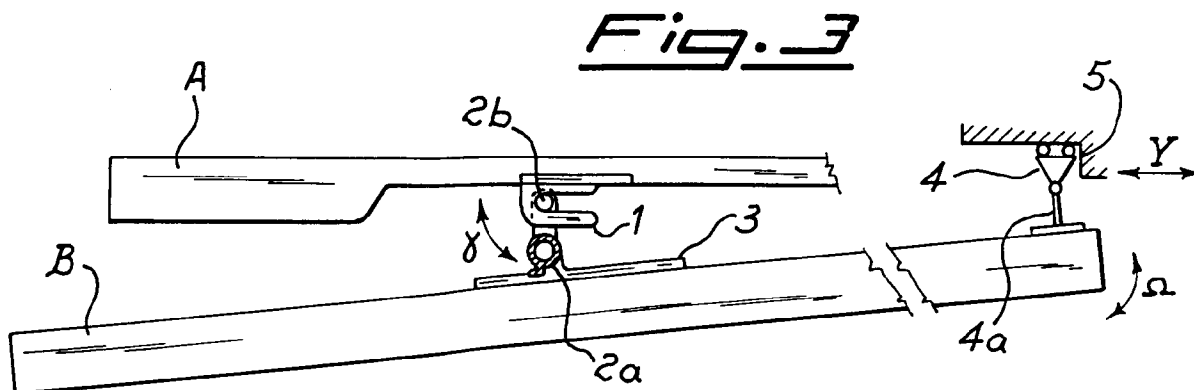
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(54) **A device for slidably-partingly mounting a lining panel on the door of an embedded household appliance.**

(57) A mounting device for a normally solid wood panel adapted to cover the front door of an embedded household appliance, in particular a dishwashing machine, when opening said bottom edge pivoted door, causes a sliding and simultaneous parting motion of said panel relative to the door. This is obtained through known rolling supports or sliding guides, in the upper portion of the panel where it contacts the door, and through an engagement between stationary hooks and lever or link members in the lower portion thereof, adapted to make said panel to part from said door, due to gravity, when opening said door.



This invention concerns a device for slidably-partly mounting the lining panel on the door of an embedded household appliance, in particular a dishwasher machine.

As it is known, the present general trend, complying in particular with the furniture-maker requirements, is to have embedded household appliances which are as much as possible integrated with the surrounding furniture, so that not even the front control panel shows outside, nor any other detail which may be suggesting the nature thereof, or which may not match perfectly with the other pieces of furniture and household appliances in the kitchen environment.

It is already known to use lining panels for the bottom-edge pivoted dish-washer front loading doors, which panels are mounted in different ways on said doors, and in particular, according to the most recent approach, by providing a sliding motion of said panel relative to the appliance door. The purpose of this is to avoid an exaggerated backwards tilting motion of the lower end of the panel, which cannot be contained within the special recess provided underneath the door, particularly in those cases where the height of said panel had to be modified in order to make the panel still completely integrated when the machine is installed with the support feet raised at their maximum height for alignment at a higher level, while the base board has remained the standard size. This is obtained by hooking the panel to the door in fixed points at the bottom side and by providing sliding guides in the top region.

However it has been found, mainly for safety reasons, that it is preferable to divide the motion of the panel relative to the appliance door in an angular motion for parting from said door in addition to a simple sliding motion.

Therefore, it is an object of this invention to provide an embedded household appliance door lining panel mounting device, in particular for a dish-washer machine, which enables a combined sliding-parting motion to take place, when opening said door.

The above object is met by providing at least a small plate, fastened in the area of the lower side of said panel, carrying the end of a small fork-shaped link or lever pivoted thereon, which has the opposite end freely engageable by a hook correspondingly fastened on the appliance door.

Due to the weight of the panel, the opening of the door through a downward tilting around the bottom hinges causes the panel to part from said door while the lever turns and comes to a position perpendicular to the confronting surfaces of the panel and door, with a simultaneous forward sliding motion of said panel, permitted by the known type upper guides. The latter are provided with a stop or limit means which naturally prevents an exaggerated sliding motion and unhooking of the mounting lever.

The above and other objects, advantages and

features of the device according to this invention will become apparent from the following detailed description of a preferred embodiment thereof, reported herein for exemplary and non limiting purposes, reference being made to the attached drawings wherein:

Figure 1 shows a device according to this invention, during assembly;

Figure 2 shows the same device in the closed door, vertical position; and

Figure 3 shows still the same device in an open door, substantially horizontal position.

Referring now to the drawings, there is partially and schematically shown at A an embedded household appliance door, which is pivoted at the bottom edge thereof in a known way by means of hinges (not shown), typically although not necessarily a dishwasher door. At B there is shown a panel, preferably solid wood, provided for completely lining and covering door A. In a known fashion, at the top of door A there is provided a device, schematically shown at 4 as a sliding-rolling support, comprising for instance a guide means within which a pin 4a may slide and rotate only in the sliding plane, being fastened to the top portion of panel B. Then, the engagement 4-4a provides two degrees of freedom only in the plane of the drawing.

According to this invention, on the lower side of panel B there is fastened at least a single support 3, and preferably a pair of metal plates, each of which carries pivoted thereon end 2a of a lever or small link 2 whose body is provided with a through opening, not shown in the drawings, located between said end 2a and the opposite free end 2b, and having preferably a cylindrical shape whose centerline runs transverse to the longer dimension of said lever, and parallel to the pivoting axis of fulcrum 2a.

For each member 2, door A carries correspondingly fastened thereon, a hook 1 provided with an upwards facing hooking member.

Referring now in particular to Figure 1, panel B is assembled on door A by first subjecting said panel to a traversing motion, shown schematically by arrow  $\beta$ , in order to insert hook 1 through lever 2 whereby free end 2b of the latter may be freely received within the U-shaped seat provided by said hook. Panel B is then made to perform a pivoting motion shown schematically by arrow  $\alpha$  to hook it at the upper portion thereof by means of pin 4a within guide means 4, or rolling-sliding support 4.

Therefore, when the door is closed, the situation is like the one shown in Figure 2, wherein lever or link 2 is substantially parallel to hook 1, with pivot pin 2a underneath the latter, then parallel also to the confronting surfaces of door A and panel B. The room taken in the transverse direction is substantially only the one corresponding to hook 1. When opening the door, due to the force of gravity, panel B parts from the door under the effect of its own weight while the link goes

through a motion shown at  $\gamma$ , coming to a position perpendicular to the confronting surfaces and transverse to hook 1. Meanwhile the panel rotates through an angle  $\Omega$  and simultaneously it moves forward by Y.

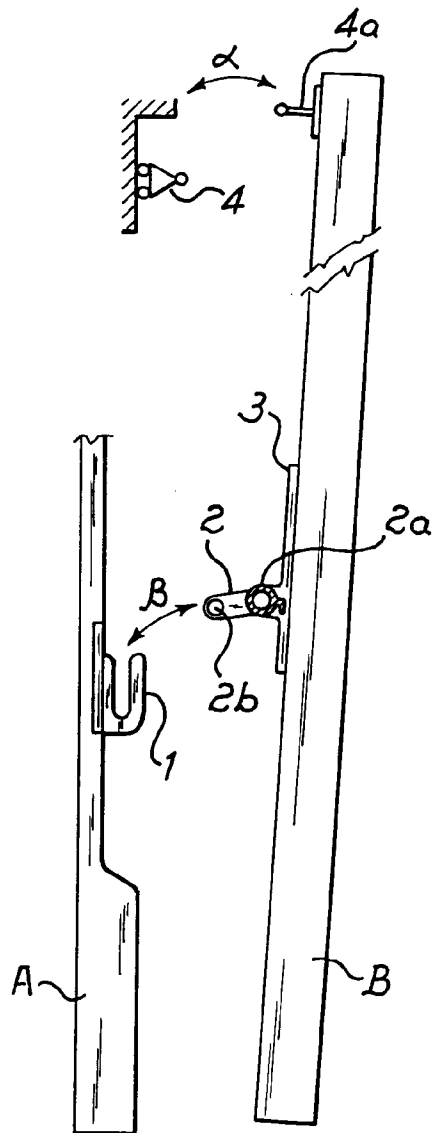
It should be noticed that, although link 2 is not strictly confined by hook 1, which makes a necessary condition for fast assembly and disassembly operations, accidental unhooking of panel B due to link 2 sliding along hook 1 is prevented, since rolling-sliding support 4 has a well-defined stroke which, as it is shown schematically in Figure 3, comes to an end when rolling support 4 comes into engagement with an abutment 5 provided on said door A, when the latter is in an open position, whereby any further motion Y of panel B is prevented. It should further be noticed that the substantially free mounting arrangement of panel B on door A, i.e. free from springs or any other means inducing a compression force between the two members, provides the inventive device with a safety feature, in that the user is protected from the risk of having his/her fingers pinched if left inadvertently between the door and the panel, or between the latter and a stationary member of the machine, while the sliding motion along direction Y is taking place. In both cases the parting motion promptly takes place, possibly supported by the force of gravity, and it causes the panel to move apart from the dish-washer door, thereby preventing possible accidents as mentioned above.

Additions and/or modifications may possibly be made by those skilled in the art to the embodiment of the mounting device of this invention, as described and shown herein above, without exceeding the scope of protection which, as it is understood, extends to all the mechanically equivalent approaches which are equally useful.

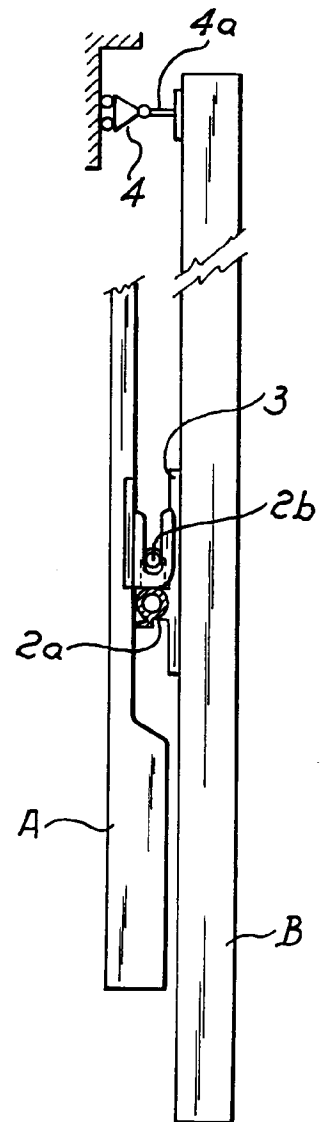
## Claims

1. A device for mounting lining panel (B) on an embedded household appliance bottom edge pivoted door (A), including rolling-sliding support means (4, 4a) for mutual hooking and sliding, on the top portion thereof, characterized by including, in the lower region of panel (B) at least a support plate (3) having pivoted thereon an end (2a) of a fork-shaped link or lever (2) whose opposite end (2b) is freely engageable by a hook (1) correspondingly fastened on appliance door (A), whereby the opening of the door which moves from a vertical to a horizontal position, causes said panel (B) to part from said door due to gravity, and a simultaneous rotation of said lever or link (2) accompanied by a panel sliding motion (Y) in the direction permitted by said rolling-sliding guide means (4, 4a).
2. The device of claim 1, characterized in that it includes a pair of said levers or links (2) symmetrically arranged on the surface of panel (B) which confronts door (A), in a symmetrical position relative to a vertical center line of said panel, wherein each of said levers (2) has a cylindrical through opening between said pivoted end (2a) and free end (2b), while on the confronting surface of door (A) there is correspondingly fastened a pair of upward opening hooks (1) whose free end may be received in said through opening of lever (2), whereby free end (2b) of the latter may in turn be freely received in the U-shaped seat of said hook.
3. The device of claim 1 or 2, characterized in that said sliding motion guiding means (4) have a stop abutment for limiting said sliding motion (Y) to the length corresponding to said rotation of lever or link (2), so preventing end (2b) of the latter from sliding along said hook (1).

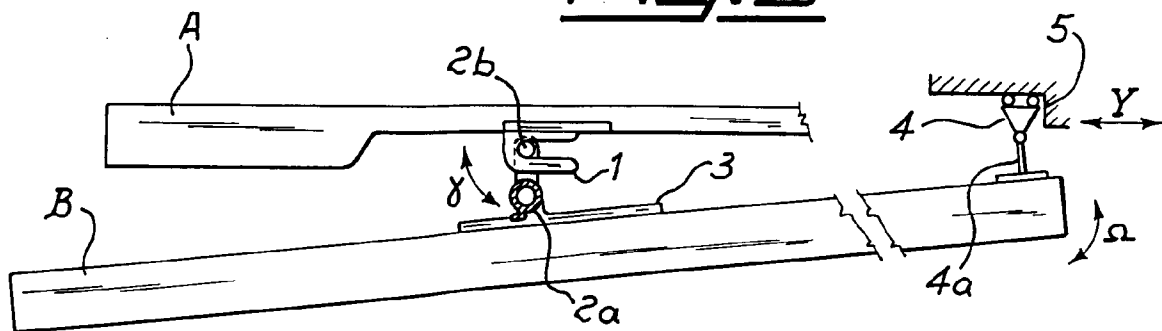
*Fig.1*



*Fig.2*



*Fig.3*





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0332

| 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) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | EP-A-0 162 028 (AKTIEBOLAGET ELECTROLUX)<br>* abstract; figures 1-3 *                           | 1                                                   | A47L15/42<br>F24C15/02                        |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FR-A-2 485 913 (INDUSTIE ZANUSSI S.P.A.)<br>* page 1 - page 2, line 8; figures 1,2 *            | 1,2                                                 |                                               |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FR-A-2 457 097 (BOSCH-SIEMENS HAUSGERATE GMBH)<br>* page 1 - page 3, paragraph 1; figures 1,2 * | 1                                                   |                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                 |                                                     | TECHNICAL FIELDS SEARCHED (Int. Cl.5)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                 |                                                     | A47L<br>F24C<br>A47B<br>D06F                  |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                 |                                                     |                                               |
| Place of search<br>THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                 | Date of completion of the search<br>12 OCTOBER 1992 | Examiner<br>JONES C.                          |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons<br/> &amp; : member of the same patent family, corresponding document</p> |                                                                                                 |                                                     |                                               |

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