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(54) **DOUBLE-SIDED DOOR WITH INTEGRATED UNIVERSAL HINGE**

(57) The present invention describes a component of furniture for decore, which has as its object a door with an internal integrated universal hinge.

Until today, hinges for doors, they are conceived differently.

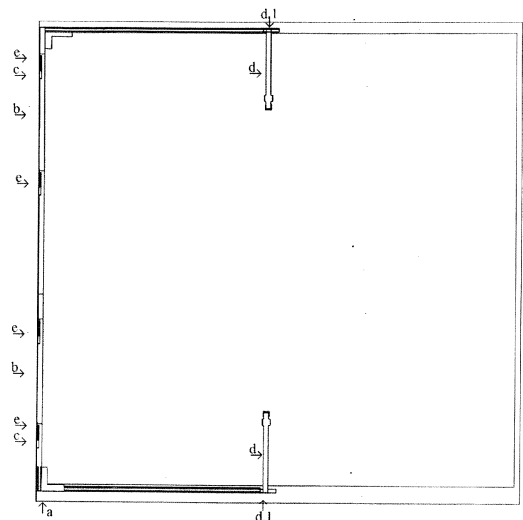
In fact, the hinge in question allows the door to rotate on itself, allowing the use of both sides of the panel.

The rotation of the door can have different types of practical applications; allow the use of the internal facade after the external one has deteriorated or damaged over time, allow the choice of different styles and / or colors, made on both sides (internal and external).

It should also be considered that the doors used today are exploited only on the outside, since holes are engraved on the inside that do not allow their use. The present invention improves and "revolutionise" the use of the door, giving the possibility of using both sides, thanks to the integrated universal hinge that guarantees the rotation and subsequent closing of the door itself. Therefore, the invention that is the subject of the application may provide for a practical application for various opening mechanisms for doors, such as, for example, the "swing", "tilting" or "flap" and "Chest of drawers".

The three types of openings can be applied to different styles of furniture and can be used for different types of housing needs.

Fig.2



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Description

[0001] The present invention, referred to as a double-sided door with integrated universal hinge, relates to a door which is internally composed of an integrated universal hinge. The invention is part of the technical sector concerning furniture and more generally furnishings of all kinds.

[0002] In particular, with the present invention it is possible to use both sides of a door which is part of any type of furniture.

[0003] To date, there are no doors on the market that allow the use of both sides. In fact, today's doors with attached hinges are conceived in a different way, with respect to the proposed invention. Since the doors are used only for their external part, leaving the internal part unused, since holes are engraved on the latter which do not allow the use of both sides of the door.

[0004] Furthermore, the only system currently in use, for being able to change, for example, the color of the door, is more onerous and less practical than the one proposed, since in order to be able to change the color of the door, it is necessary to have a door made of metallic, on which a magnetic "cover" can then be applied, which allows the color to be changed.

[0005] To date, there are no doors on the market that allow the use of both sides. In fact, today's doors with attached hinges are conceived in a different way, with respect to the proposed invention. Since the doors are used only for their external part, leaving the internal part unused, since holes are engraved on the latter which do not allow the use of both sides of the door.

[0006] Furthermore, the only system currently in use, for being able to change, for example, the color of the door, is more onerous and less practical than the one proposed, since in order to be able to change the color of the door, it is necessary to have a door made of metallic, on which a magnetic "cover" can then be applied, which allows the color to be changed.

[0007] With this system, which is very onerous, it is not possible to use different styles, between one side of the door and the other, as, by doing so, only the color of the door can be changed.

[0008] Furthermore, to date, another existing procedure for changing the color of the door involves the use of adhesive films on it which are naturally impractical for the end user and difficult to apply.

[0009] The double-sided door with integrated universal hinge, designed, allows the door to rotate on itself, allowing the use of both sides of the panel, both internal and external, as the integrated universal hinge is applied in the internal grooves of the door.

[0010] Therefore, with the present invention, the aim is to improve and revolutionize the use of the door, thus making it possible to use both sides, thanks to the special integrated universal hinges which guarantee the rotation and subsequent closure of the door itself. By doing so, there is a significant reduction in costs in the short and

medium-long term. In fact, the proposed invention allows for greater conservation over time of the doors, as both faces can be used.

[0011] Therefore, the rotation of the door/panel brings different types of benefits and different uses, such as:

1. Benefits/Uses For deterioration and/or wear. It is possible to use the internal facade after the external one has suffered damage or deterioration from external agents over time.
2. Benefits - Environmental in nature. The possibility of using both sides of the doors certainly brings benefits, also in environmental terms, for the saving of material, and since before replacing a door due to wear it will be possible to use the other side up to that moment not yet used.
3. Uses - Choice of color and/or style. With the rotation of the door, it is possible to choose different types of styles and/or colours, which can be made on both faces (internal and external).

[0012] The characteristics of the invention are highlighted in detail below reference to the attached drawings filed, in particular:

- Fig. 1, represents an example of the use of the invention, depicts an "axonometric exploded view", which shows the individual elements that make up the invention or the various assembly methods of the components themselves.
- Fig. 2 shows a "vertical section" of the double-sided door with integrated universal hinge. Shows the application of the hinge designed in the internal grooves of the door.
- Fig. 3, on the other hand, represents an enlargement of the locking system of the sliding carriage which allows to prevent the latter from coming out of the door on which the carriage is applied.
- Fig. 4 shows a first possible practical application of the invention, namely the opening of the "hinged" door. In fact, the door rotates on itself by 180°, allowing the use of both sides thanks to the integrated universal hinge.
- Fig. 5 represents a second possible practical application of the invention, i.e. the tilting or tilting opening. In fact, the door rotates on itself by 180°, allowing the use of both sides thanks to the integrated universal hinge.
- Fig. 6, depicts a third possible practical application of the invention, i.e. the chest of drawers opening. Since the door rotates 180° on itself, it allows the use of both sides thanks to the integrated universal hinge.

[0013] It should be noted that in the figures of the deposited drawings, identical or similar elements have been indicated with the same reference numbers. Furthermore, in the deposited drawings, the x-axis, i.e. the hor-

horizontal plane, and the y-axis, i.e. the vertical plane, are used as a spatial reference, which are also shown within the tables for a better understanding of the drawings. In particular.

[0014] Fig. 1 represents all the components that make up the invention. The door (a) has grooves on each side (a.1), and is made up of a series of aesthetic components/accessories (a.2 - a.3 - a.4 - a.5), which they go to hide the grooves. The integrated universal hinge, on the other hand, is formed by a series of carriages (b - c - d), the carriage (b), or a "c profile", has "female" cylinders on the end. Carriage (b) acts as a sliding rail for component (c), which has three holes and two cuts.

[0015] The carriage (c) in addition to having a vertical translation on the "y" axis, also acts as a semi-fixed part on the "x" axis.

[0016] Therefore, component (d) is made up of a cut on one side, while the other end is formed by a cylinder, which allows the rotary mechanism of the door, on which a "compression spring" is applied, which facilitates the expulsion of the cylinder from the leaf (a).

[0017] The component (d.1), (see Fig. 3), represents a locking system, both to prevent the cylinder from coming out of the hole, assisted by a spring inserted inside the hollow cylinder (d.3). While, with regard to parts (c - d), there are engraved cuts in which a "flat spring" (b.1 - c.1) is inserted, which allow the locking or unlocking of the rail opening mechanism, with the related vertical and/or horizontal scrolling (c - d). Furthermore, a "bearing" (h) is inserted to facilitate the sliding of the rail (d).

[0018] The component (e) allows the opening of the door (a), which is formed by a sheet with broken shapes, having a series of folds at 90°, modeled in order to be one with the grooves (a. 1). Furthermore, it is fixed with a bolt (e.1) to component (b). The end of component (e) is fixed to the inside of the cabinet, with the aid of screws, as better specified later in Fig. 4. The other bend of component (e) has two male cylinders, which with a bolt (e.1) is fixed to the female cylinders of component (b), (see Fig. 4.)

[0019] The component (f), i.e. a rectangular sheet, is applied to the furniture frame with the aid of screws, acting as a sliding carriage for the component (e), finding application for the "flap" and "chest of drawers" door. Component (g) is substantially a sheet with broken shapes, which is applied to an existing carriage of a coffered cabinet and to arms for already existing "flap" doors, furthermore it is fixed to the fixed part of component (c), through holes with the aid of screws.

[0020] Fig. 2 presents a front section of the invention in question. It represents the integrated universal hinge applied inside the door, the hinge adheres perfectly to the door through the grooves on each side, thus demonstrating its transparency in the prospectus.

[0021] Fig. 3 represents an enlargement of the component (d.1), that is, it concerns the locking system of the hinge and of the door, which allows the rotation of the same. The component (d.2) is a "tension spring"

which facilitates the expulsion of the cylinder from the leaf. The component (d.3), is fixed to the component (a) with the aid of screws and acts as a block to prevent the cylinder from coming out of the other component (d).

[0022] Fig. 4 represents the door rotation mechanism (a), made possible thanks to the integrated universal hinge, with the enlargement of the component (e). In step no. 1, one side of the door (a) already applied to the furniture frame is visible.

[0023] In step no. 2 shows the opening mechanism of the integrated universal hinge, which occurs through the translation along the "x" axis of component (a), which unlocks the opening of the integrated universal hinge. Then a translation of the component (c) takes place along the "y" axis thanks to the component (b) which acts as a sliding track. It is fixed to the piece of furniture using component (e), i.e. the lamina with broken shapes, with screws, and is instead fixed to component (b) with a bolt (e.1). Finally, a rotation of component (a) takes place.

[0024] In step 3 the component (a.1) is depicted. Furthermore, an enlargement of the coupling system between the fixed component (b) and the mobile one (e) with the aid of a bolt (e.1) is shown.

[0025] Fig. 5 represents the rotation mechanism of the double-sided door with integrated universal hinge applied on a flap-down cabinet. Once the piece of furniture has been opened, the component (g) with broken shapes is removed, which allows the opening mechanism of the integrated universal hinge to be released, in fact, it is fixed on an existing flap arm and is anchored to the component (c) through holes with the aid of screws.

[0026] The opening movement takes place, through the component (f), a rectangular lamina, fixed to the frame of the piece of furniture with the aid of screws. It acts as a sliding carriage for component (e) which is instead anchored to the fixed part of component (b). The integrated universal hinge opens by sliding the component (c) along the "x" axis by releasing the "flat spring" (b.1 - c.1) of the components (c - d), thus carrying out the rotation of component (a). In step 5, component (a.1) is shown.

[0027] Furthermore, an enlargement of the attachment between component (g) and component (c) by means of holes with the aid of screws is shown.

[0028] Fig. 6 represents the rotation mechanism of the door applied to a chest of drawers. In the figure step n. 1, one side of the door (a) already applied to the furniture frame is visible. While in the representation of step n. 2, the opening mechanism of the hinge is shown, which takes place with the removal of the component (g) lamina with broken shapes, which is fixed on pre-existing trolleys and anchored to the component (c) by means of the interlocking cylinders. In the representation of step n. 3, the opening of the universal hinge integrated along the axis of the "x" of the component (c) is represented through the release of the "flat spring", of the components of the tracks (c - d) which make it possible to rotate the component (a).

[0029] In step 5 component (a.1) is shown, and an enlargement of component (e) is also shown, i.e. foil with broken shapes, which allows the door to open.

[0030] With the filing of the present invention, three different types of implementation of the double-sided door with integrated universal hinge have been disclosed. (See Fig. 4, Fig. 5 and Fig. 6)

[0031] One of the aforesaid embodiments, reproduced in Fig. 4, represents a practical application of the invention, i.e. the so-called "hinged" opening of the door. In fact, the door rotates 180° on itself and this is made possible thanks to the integrated universal hinge placed inside, which in doing so makes it possible to use both sides.

[0032] Naturally, the solution described can be modified without departing from the scope of protection defined by the claims of the present patent. The door (a) has grooves on each side (a.1), and is made up of a series of aesthetic components/accessories (a.2 - a.3 - a.4 - a.5), which they are optional and can be made of different types of materials, and hide the grooves on the door (a).

[0033] The integrated universal hinge, forming part of the door (a), is made up of a series of carriages (b, c, d), which have a flat spring inside (b.1 - c.1), which allow locking or unlocking the opening mechanism of the integrated universal hinge.

[0034] Furthermore, in order to make the opening movement of the carriages (b, c, d) easier, the bearings (h) are inserted inside the carriages themselves.

[0035] The component (d), is made up of a cut on one side, while the other end is formed by a cylinder, which allows the rotary mechanism of the door (a), and on this a "compression spring" is applied (d.2), inserted inside the hollow cylinder (d.3), which facilitates the expulsion of the cylinder from the leaf (a).

[0036] While, the component (e), i.e., lamina with broken shapes, makes it possible to open the door (a) and is engaged on the carriage (b) with the aid of a bolt (e.1). Furthermore, the component (e) is characterized by a series of 90° folds, which adhere to the grooves (a.1) of the door (a), which make the universal hinge integrated in the prospectus invisible.

[0037] Instead, the component (f), called rectangular plate, is applied to the frame of the piece of furniture, with the aid of screws, acting as a sliding carriage for the component (e), finding application for one of the implementation methods, both for the "flap" door, and for the "chest of drawers" door.

[0038] The component (g) is a sheet with broken shapes, which is fixed on one side on the carriage (c), with the aid of screws, on the other side instead it is hooked onto already existing components, i.e. to the guide for the mobile drawers and on the arms for the flap doors.

[0039] Therefore, the primary intent of the present invention is to provide a double-sided door with integrated universal hinge of the type indicated, economical in its

production and simple in its use and operation.

[0040] The production of the integrated universal hinge attached to the double-sided door can be carried out using special industrial machinery, such as by way of example only: profiling and/or bending machines. While the double-sided door is produced using industrial type cutters or using hydraulic presses, for gluing several panels.

[0041] Therefore, it is clear from the foregoing that the double-sided door with integrated universal hinge allows the doors that form the furniture to be used in a wholly original way, different from those currently known, and therefore the proposed invention is capable optimize the use of both sides of the door through the universal hinge which allows it to rotate, creating new and sophisticated aesthetic effects, offering the furniture maker or user a wider range of entirely innovative creative variations.

Claims

1. The integrated universal hinge is made up of guides and carriages (b - c - d), the locking system (d.1), the plate **characterized by** broken shapes (e), the rectangular plate (f) and the plate having broken shapes (g), applied in the internal grooves of the door (a).
2. The integrated universal hinge, according to claim 1, comprising the double-sided door (a), formed by grooves (a.1), located on all four edges of the door (a).
3. The integrated universal hinge, according to claim 1, is formed by a sheet with broken shapes (g) which is applied on an existing carriage of a "chest of drawers" piece of furniture and/or on arms for "flap" doors.
4. The integrated universal hinge, according to the preceding claims, **characterized in that** the locking system (d.1) is formed by a "tension spring" (d.2) which facilitates the ejection of the cylinder applied to the carriage (d) from the leaf (a), as well as from a plate fixed to the leaf (a) with the aid of screws, which acts as a block to prevent the cylinder placed at the end of the rail (d) from coming out.
5. The integrated universal hinge, according to claim 1, comprising a lamina with broken shapes (e), which is **characterized by** a series of 90° folds, modeled in order to be one with the grooves of the door (a.1), becoming invisible in the prospectus, which is engaged on the carriage (b) with the aid of a bolt (e.1).
6. The integrated universal hinge, according to claim 1, is formed by the rectangular lamina (f) and is applied to the furniture frame with the aid of screws, acting as a guide for the sliding of the lamina **characterized by** broken shapes (e), system that can be

used only for the applications of "flap" doors and "drawers".

7. The double-sided door, according to the preceding claims, is **characterized in that** each groove (a.1) ⁵ is hidden by aesthetic accessories (a.2 - a.3 - a.4 - a.5).
8. The double-sided door (a), according to the preceding claims, comprises holes in the grooves, where ¹⁰ the cylinder placed on the end of the rail (d) is applied inside them, which allows the rotary mechanism of the door (a).

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Fig. 1

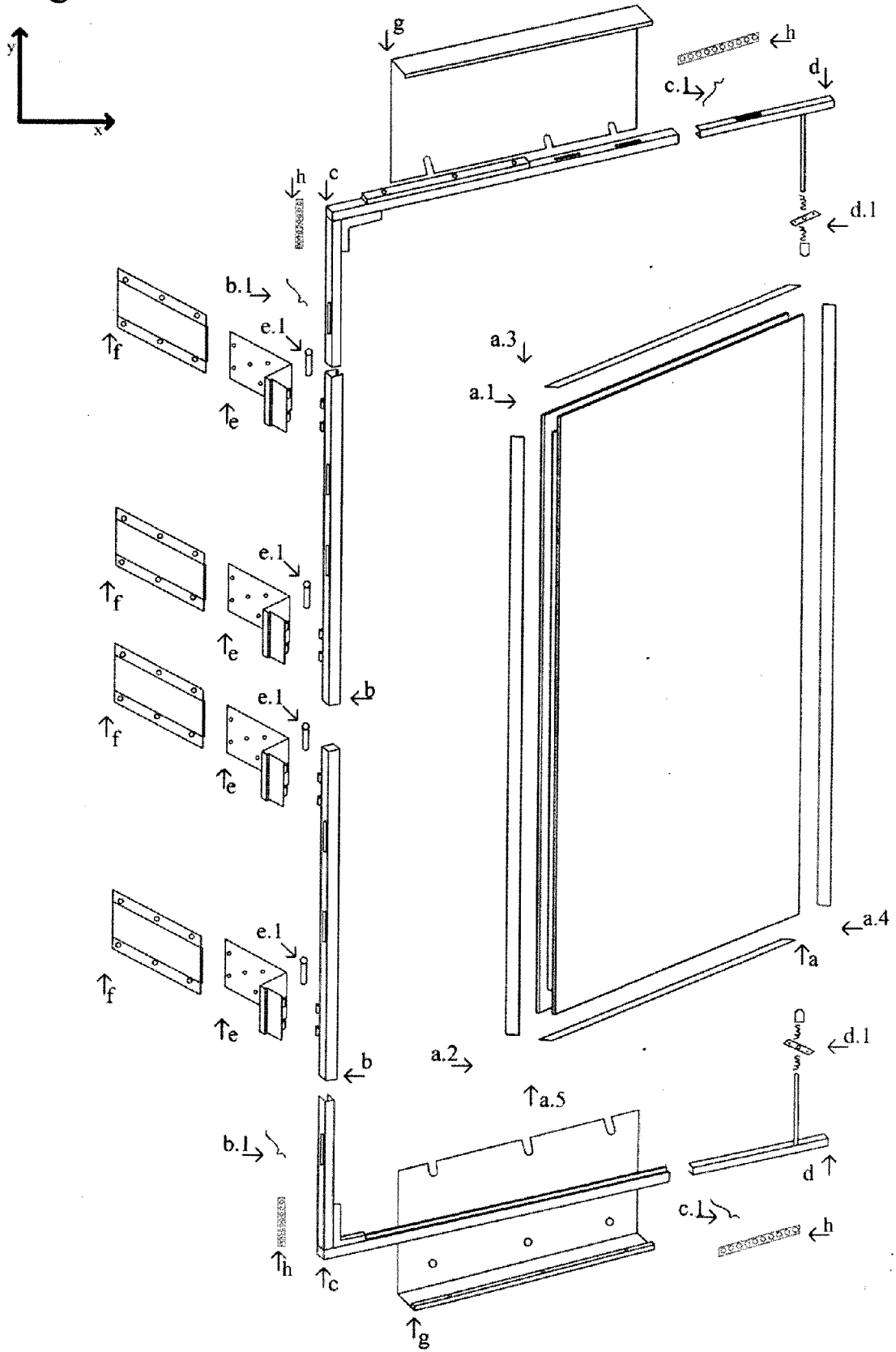


Fig.2

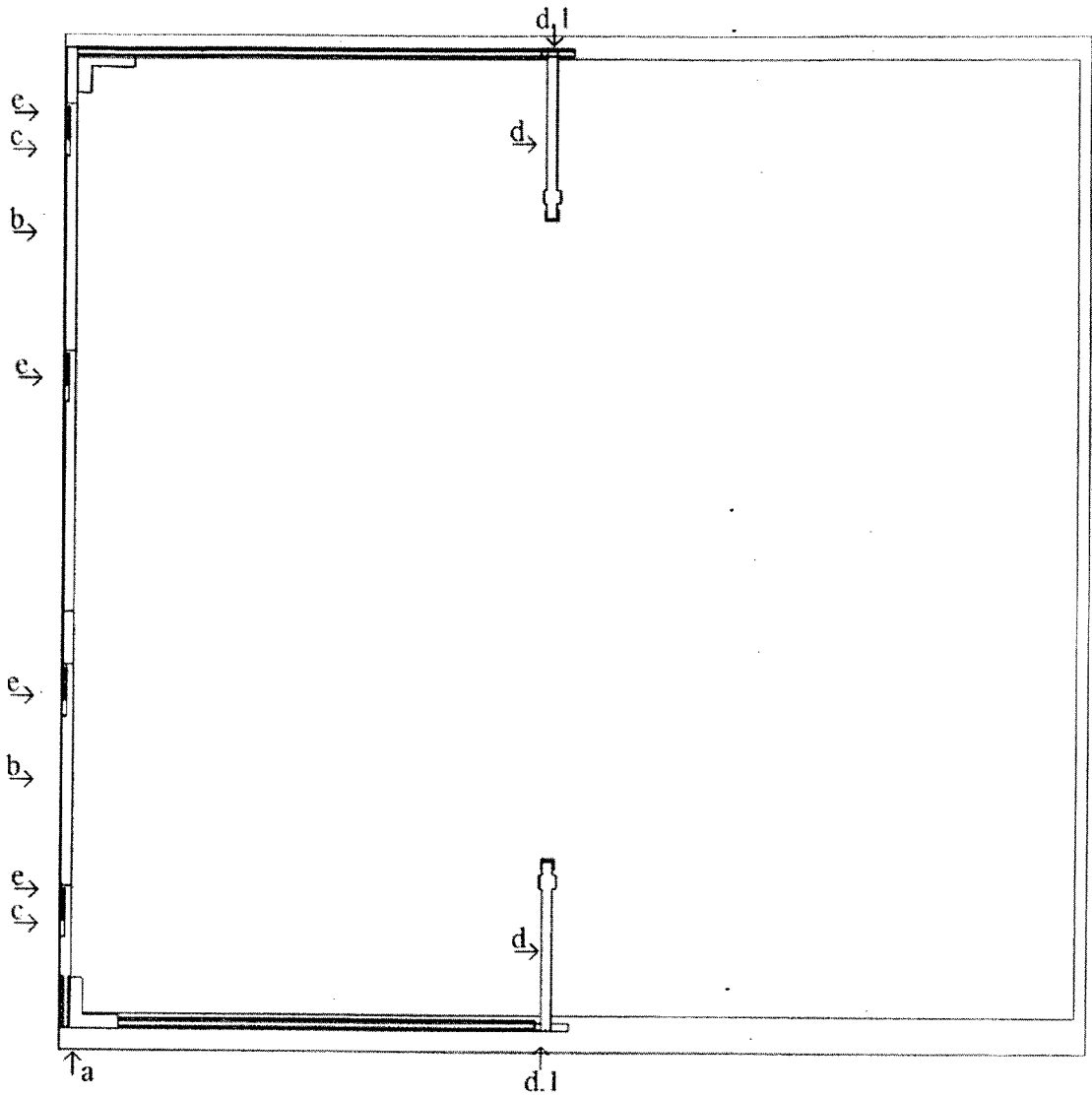


Fig.3

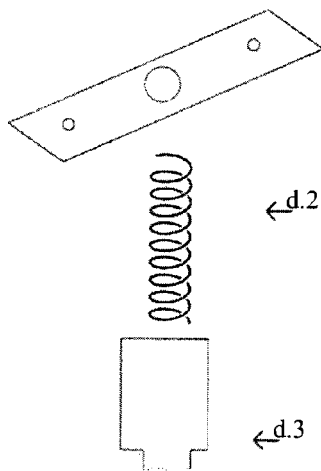


Fig.4

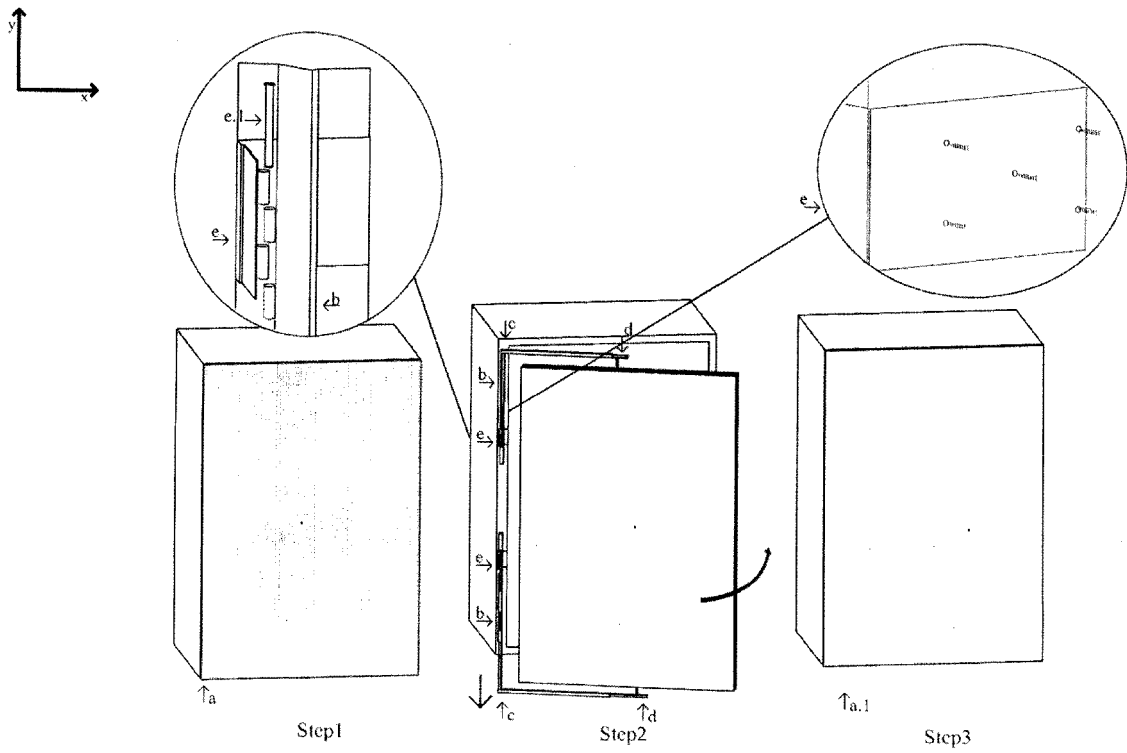


Fig.5

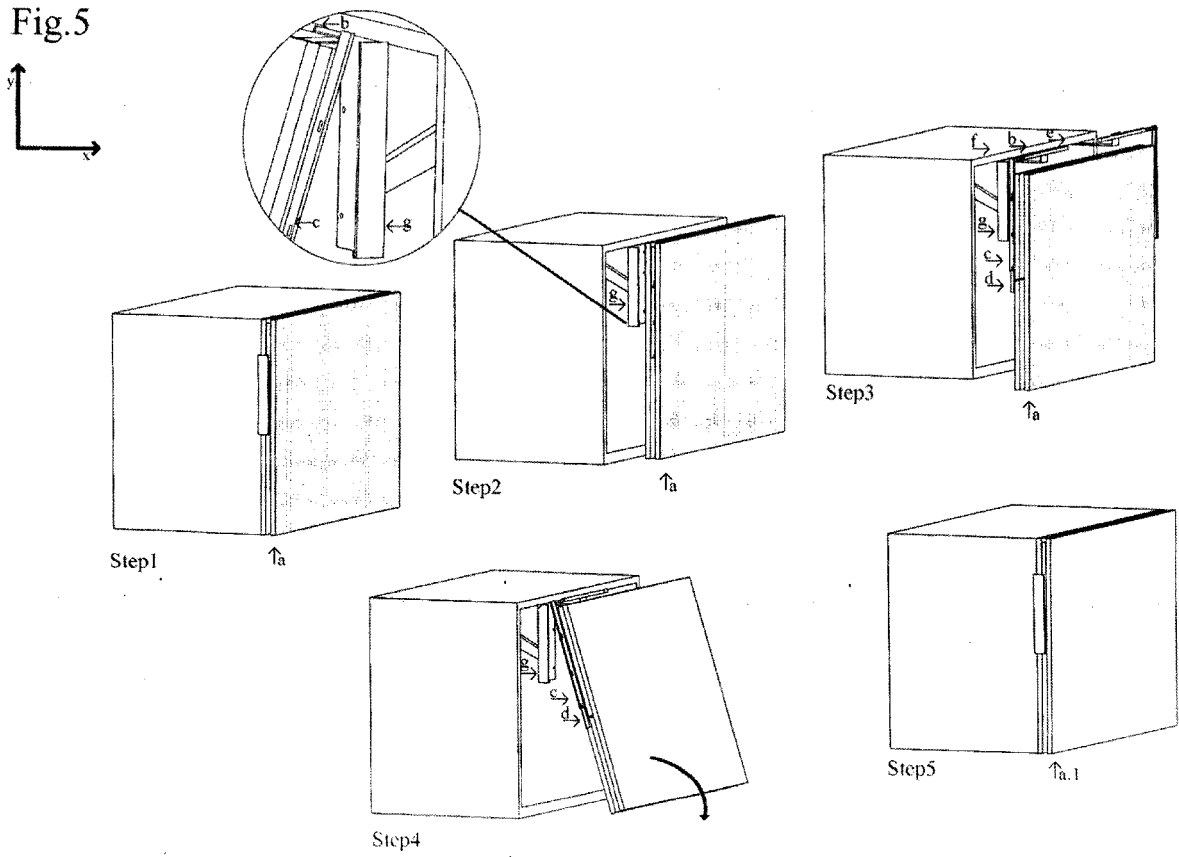
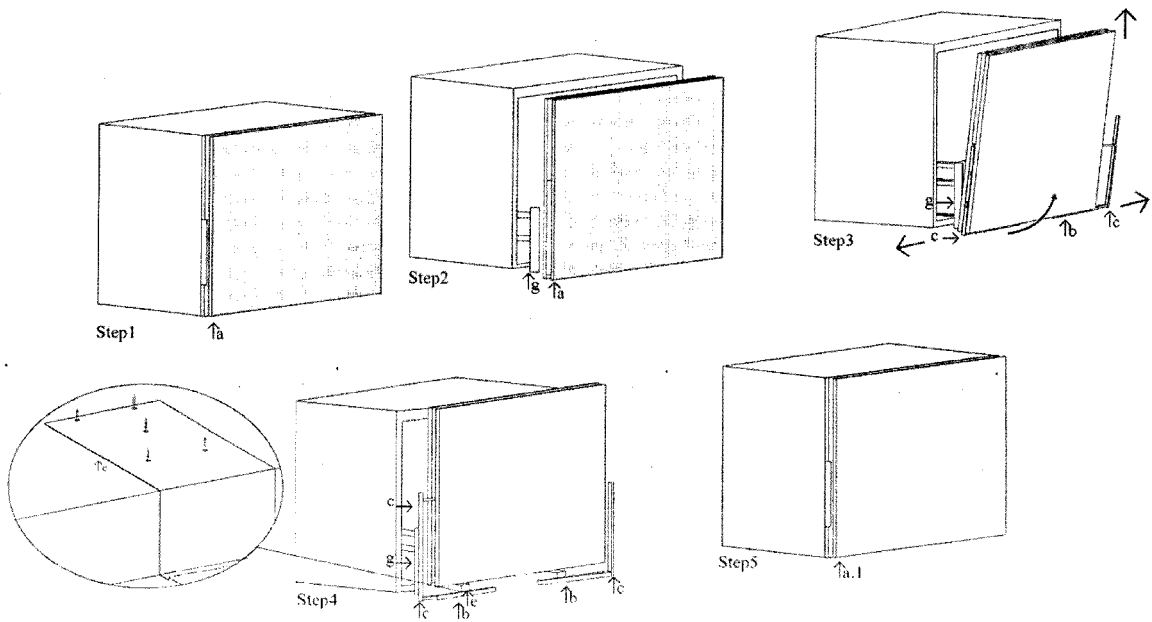
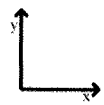


Fig.6





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Application Number

EP 23 42 5012

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The present search report has been drawn up for all claims			
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The Hague		22 September 2023	Prieto, Daniel
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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ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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