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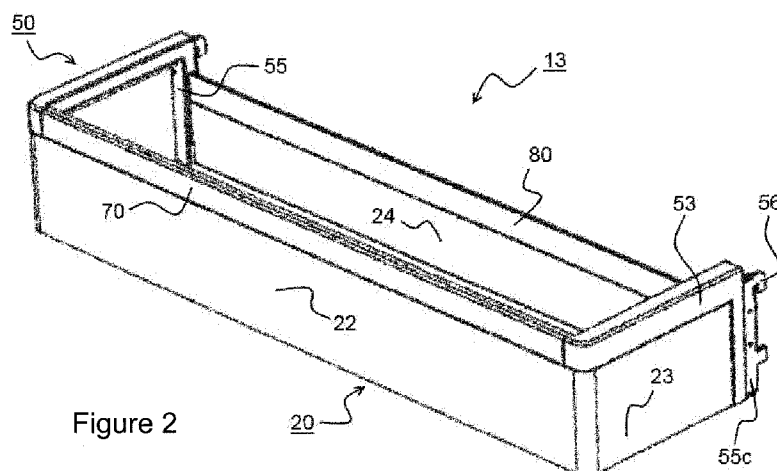


Figure 2

(57) Abstract: The present invention is a home appliance (1), particularly a refrigerator, comprising a door (10); and a door shelf (13) positioned on a door face (11) and having a compartment (20) and a frame (50) which has at least three edges and which encircles an upper opening (26) of the compartment (20) and which is connected to the compartment (20); characterized in that the frame (50) has at least one connection element (56) for providing supporting of the compartment (20), connected to the frame (50), on the door (10).

SPECIFICATION

A HOME APPLIANCE COMPRISING A DOOR SHELF HAVING A FRAME WHICH SUPPORTS A COMPARTMENT

TECHNICAL FIELD

The present invention relates to a home appliance, particularly a refrigerator having a door and a door shelf provided on a door face.

KNOWN STATE OF THE ART

In a home appliance like a refrigerator, particularly a domestic refrigerator having a door, a storage space is defined by the door and the home appliance body. In general, compartments called door shelf are placed onto the inner face of the door. Thus, the storage space can be used in a more efficient manner.

The door shelf has a front wall, two mutual side walls and a base. When the door shelf is connected to the door, the related face of the door is functioning as a rear wall for the door shelf. The door shelf has no upper wall, and it has an opening. Thus, an item which is to be kept in the home appliance can be put to the door shelf or said item can be taken from the door shelf.

The door shelf is in general connected to a connection section, provided on the door, in a removable manner. Thus, the door shelf can be connected to one of pluralities of connection sections provided on the door, and thereby usability can be provided.

The door shelf comprises a frame connected to the walls of the door shelf mostly in a manner surrounding the opening. As an example to this, the door shelf described in the patent document WO2014090726A1 can be given. According to the document, the invention relates to a cooling device having a door shelf. The door shelf comprises a body, and a frame fixed to the body. The door shelf moreover has an auxiliary frame. On the two side walls of the body, a holding device is provided for connecting the door shelf to the door. On the frame,

there are recesses corresponding to the holding devices. Thus, the frame does not cover the holding devices.

In such door shelves, the load, formed on the door shelf due to the items put at the door shelf and due to the own weight of the door shelf, is transferred onto the door through the holding devices provided on said body.

The invention provides an additional improvement, an additional advantage or an alternative to the present art described above.

OBJECT OF THE INVENTION

The main object of the present invention is to provide a home appliance having a door shelf providing distribution of the load, placed into the door shelf, without concentrating in a region on the compartment.

In order to achieve the abovementioned object, the present invention relates to a home appliance, particularly a refrigerator, comprising a door; and a door shelf positioned on a door face and having a compartment and a frame which has at least three edges and which encircles an upper opening of the compartment and which is connected to the compartment. The present invention is characterized in that the frame has at least one connection element for providing supporting of the compartment, connected to the frame, on the door. Thus, the load formed on the compartment can be distributed onto the edges of the frame, supporting the compartment, through at least three walls of the compartment. By means of this, the load can be prevented from being concentrating at a specific point of the compartment, and from leading to a possible physical deformation on the compartment. This may favorably affect the usage lifetime of the compartment. In other words, the usage lifetime of the compartment can be extended. Additionally, compartments with different designs can be formed on the same frame, and the door shelf can be differentiated without increasing complexity according to the brand or model.

In a possible embodiment of the present invention, the frame and the compartment are coupled to each other by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the assembly processes required for obtaining the door shelf can

be facilitated and accelerated. Moreover, since no external connection element is used, the material and labor costs and thus the production costs can be kept low. For instance, the frame may comprise a frame recess which provides connection of the frame to the compartment and which faces downwardly such that the open side faces into the compartment and/or such that the open side faces a side wall of the compartment whereto the frame is connected. In the same embodiment or in another probable embodiment, the frame comprises a frame protrusion which provides connection to the compartment and which extends inwards the compartment and/or which extends towards a side wall of the compartment whereto the frame is connected. In a possible embodiment of the present invention, in order to provide the connection of the compartment to the frame, a compartment recess may be provided whose open side faces towards the frame and/or whose open side faces towards outside of the compartment. In the same embodiment or in another probable embodiment, in order to provide the connection of the compartment to the frame, a compartment protrusion is provided which extends towards the frame and/or which extends towards outside of the frame.

The frame recess and the frame protrusion and the compartment recess and the compartment protrusion can be provided mutually in a compliant manner completing each other. Thus, they may form shape coupling or force coupling. For instance, they may be connected to each other by means of methods like engagement, locking or slider engagement.

In a possible embodiment of the present invention, the frame comprises a connection extension having connection element and extending in a parallel manner with respect to the door face whereto the door shelf is connected. Thus, the only feature contacting the door and transferring the load to the door is the frame. This may prevent application of an external and regional load onto the compartment and may prevent exertion of a force onto the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment of the present invention, the compartment comprises a housing wherein the connection extension is positioned. Thus, the appearance of the connection extension as a protrusion or as an excessive part on the compartment can be prevented. The door shelf can be viewed as a whole. Moreover, by means of the housing, it can be

understood that the frame and compartment connection is made in a correct and firm manner. In other words, the housing can be used as an assembly guide.

In a possible embodiment of the present invention, the connection extension comprises a support protrusion which prevents bending of a wall of the compartment, which is adjacent to the connection extension, inwards the compartment. Thus, in compartment embodiments without rear wall or without side wall not connected to the rear wall, the bending of the side wall into the compartment can be prevented. By means of this, the physical deteriorations which may occur on the compartment can be prevented.

In a possible embodiment of the present invention, the frame comprises a dampening element positioned on a face of the frame which contacts the door face. Thus, the noise, which may occur due to the contact between the door face and the frame, can be dampened. For instance, the noises, which may occur due to the contact between the metal frame and the metal door face, can be eliminated or reduced by means of a dampening element made of plastic, etc. material.

In a possible embodiment of the present invention, the frame comprises two side edges forming the two mutual edges, and a third edge connected to the side edges and extending between the side edges. Thus, by means of the sectional frame, the connection between the frame and the compartment can be facilitated. The frame may have different designs for different brands or models as a result of the variation of different features.

In a possible embodiment of the present invention, the side edge is in L-form having connection element and whose one arm forms an edge of the frame and whose other arm extends in a parallel manner with respect to the door face where to the door shelf is connected. Thus, by means of a single piece, both the section, providing the connection of the frame to the door, and the frame edge can be obtained; for instance the above mentioned connection extension can be obtained.

In a possible embodiment of the present invention, the third edge comprises an edge recess which accommodates an edge protrusion provided on the side edge. Thus, the connection between the third end and the side edges can be provided in a mechanical manner. There may remain no need for an additional fixation element. However, in a possible embodiment,

the frame comprises a fixation element, for instance, a screw which fixes the edge extension of the side edge inside the edge recess of the third edge.

In a possible embodiment of the present invention, the compartment comprises a base, two mutual side walls, and a front wall. Thus, a compartment can be obtained without consuming material for forming the rear wall. After the door shelf is coupled to the door, the related door face may form the rear wall of the compartment. Thus, an item placed into the compartment can be kept inside the compartment.

In a possible embodiment of the present invention, the compartment comprises a rear wall. Thus, in embodiments where a clearance is left between the door and the door shelf, an item placed into the compartment can be kept inside the compartment.

In a possible embodiment of the present invention, the door shelf comprises a rear profile connected to the rear wall of the compartment. Thus, by means of a rear profile which will be obtained from a material which is more resistant when compared with the material of the rear wall, the deflection of the rear wall due to the load inside the compartment can be prevented.

In a possible embodiment of the present invention, the rear profile is connected to the remaining section of the frame by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the load formed on the compartment can be distributed in a better manner on the frame. In more details, by means of a rear profile which functions as a fourth edge, a greater area can be formed for distributing the load. Moreover, by means of the rear profile, the assembly of the remaining part of the frame can be facilitated. This may reduce labor, assembly and production costs. For instance, in a possible embodiment of the present invention, the frame comprises a groove for the rear profile at a position which is close to the rear wall of the compartment.

In a possible embodiment of the present invention, the rear wall of the compartment comprises a wall extension placed to the groove provided in the frame. Thus, also the rear wall can be carried together with the frame. By means of this, the load may be prevented from accumulating at a specific point of the compartment, and from leading to a physical deformation on the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment of the present invention, the connection element is in the form of a hook placed to a shelf opening provided on the door. Thus, the door shelf can be easily connected to the door. Moreover, the door shelf can be easily displaced by the user as desired.

In a possible embodiment of the present invention, the door shelf comprises a support element which contacts the door when it is on the door. Thus, the base of the door shelf fixed to the door by means of the connection element can be provided in a parallel manner with respect to the floor. By means of the design of the connection element, the clearance between the door shelf and the door can be compensated.

The frame can be obtained from metal material, for instance from aluminum and/or zamak (zinc, aluminum, magnesium and copper alloy) by means of extrusion and/or metal injection. Moreover, the frame can also be produced from another material which has high resistance and which can resist the loads expected to be carried by the door shelf.

On the contrary, the compartment can be obtained from a polymer material except plastic or metal, or from any material known to be used in production of door shelf compartment in the related art.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 is the perspective view of a refrigerator which is a possible home appliance.

Figure 2 is the frontal perspective view of the first embodiment of the door shelf.

Figure 3 is the rear perspective view of the first embodiment of the door shelf.

Figure 4 is the frontal perspective exploded view of the first embodiment of the door shelf.

Figure 5 is the rear perspective view of the compartment of the first embodiment.

Figure 6 is the frontal perspective view of the left side edge of the first embodiment.

Figure 7 is the left dismantled partial view of the rear profile and of the compartment of the first embodiment.

Figure 8 is the dismantled perspective view of the third edge of the frame and the compartment of the first embodiment.

Figure 9 is the right view of the third edge of the second embodiment.

Figure 10 is the rear perspective view of the second embodiment of the door shelf.

Figure 11 is the rear perspective partial view of the side and front wall of the compartment of the second embodiment.

Figure 12 is the front perspective partial view of the base and rear wall of the compartment of the second embodiment.

Figure 13 is the right view of the front section of the base of the compartment of the second embodiment.

Figure 14 is the rear perspective exploded view of the third embodiment of the door shelf.

Figure 15 is the frontal perspective exploded view of the third embodiment of the door shelf.

Figure 16 is the frontal perspective view of the left side edge of the third embodiment.

THE DETAILED DESCRIPTION OF THE INVENTION

All directional references such as front, top and bottom are based on reference to the cooling device (1) shown in Figure-1, where the section provided at the left side is described as "left" and the section provided at the right side is described as "front" and the section provided at the upper side is described as "top". For instance, the door (10) of the home appliance (1) is illustrated where the door (10) is connected to the right side of the front wall of the home appliance (1) and opened towards the right side. One or more of possible embodiments of the present invention will be described as examples in detail below.

In a possible embodiment of the present invention, the home appliance (1) is a refrigerator as exemplified in Figure 1. The refrigerator door (10) is opened by rotating around a hinge towards the right side.

On an inner door face (11) of the door (10), two door shelves (13) are positioned. The door shelf (13) can be greater or smaller in number as desired. The door shelves (13) are connected to linear shelf openings (12) provided on the door face (11). There are hanger rails (not illustrated in the figures) behind said shelf openings (12). By means of the connection element (56) provided on the door shelf (13), the door shelf (13) is placed to a hanger housing provided on these rails, and the door shelf (13) is supported on the door (10).

First embodiment:

In Figure 2, the assembled view of the possible first embodiment of the door shelf (13) is given. The door shelf (13) is illustrated in a perspective view from the front right side thereof. The door shelf (13) comprises a compartment (20) and a frame (50). The compartment (20) has a front wall (22), two side walls (23), a base (21) and a rear wall (24).

In Figure 3, the rear perspective view of the door shelf (13) of the first embodiment is given from the right side.

In Figure 4, the frontal perspective view of the door shelf (13), presented as the first embodiment, is given from the right side where all items are in dismantled form. The frame (50) surrounds an upper opening (26) of the door shelf (13). The frame (50) comprises one each side edges (53) provided on the side walls (23), a third edge (70) provided on the front wall (22), and a rear profile (80) provided on the rear wall (24).

In Figure 5, the rear left perspective view of the compartment (20) of the first embodiment is given.

A compartment protrusion (30), particularly a front compartment protrusion (30a) is provided at the upper edge of the front wall (22) of the compartment (20) for connecting the third edge (70) of the frame (50). The front compartment protrusion (30a) extends substantially along the front wall (22). However, it can extend as a single piece at a specific section; or pluralities

of front compartment protrusions (30a) can be provided in a separated manner at specific intervals. The front compartment protrusion (30a) extends upwardly vertically or substantially vertically from the upper edge of the front wall (22). The front compartment protrusions (30a) has a cross section which is widening as moved away from the front wall (22). In the embodiment given in Figure 5, the front compartment protrusion (30a) has a rough drop cross section. The narrow part of the drop can continue with the same thickness, not with increasing thickness up to a specific point, and at a point, it can join with a circle cross section whose diameter is greater than the thickness of the narrow section.

On the side walls (23) of the compartment (20), a compartment recess (29) is formed such that the open inlet thereof faces outside of the compartment (20). In order to form the compartment recess (29), again a compartment protrusion (30), in other words the side compartment protrusion (30c) is formed which extends towards the outer side of the compartment (20). Said compartment recess (29) and the side compartment protrusion (30c) are defined by a first line (30d) inclined in a manner moving away from the compartment base (21) and inwards the compartment (20) from the upper edge of the side wall (23), a second line (30e) extending upwardly from the end of the first line (30d), and a third line (30f) extending out of the compartment (20) in a parallel manner with respect to the base (21) from the end of the second line (30e). The side compartment protrusion (30c) extends along the side wall (23). However, the side compartment protrusion (30c) may extend in a single piece manner at a specific section of the side wall (23), or pluralities of side compartment protrusions (30c) can be provided in a separated manner at specific intervals.

The described side compartment protrusion (30c) embodiment can be used instead of the front compartment protrusion (30a) on the front wall (22).

In Figure 6, the perspective view of the side edge (53) positioned on the left side wall (23) of the compartment (20) is given. The side edge (53) mostly has a quadrangular, for instance, rectangular or square cross section. The side edge (53) is formed in L-shape. While an arm of the L-shape is connected onto the side wall (23) of the compartment (20), the other arm is placed behind the side wall (23).

At the arm of the side edge (53) corresponding onto the side wall (23), there is a frame protrusion (52), and a frame recess (51), in other words, a side frame recess (51b) is

provided in a compliant manner to the side compartment protrusion (30c) and the compartment recess (29). When the side edge (53) is placed on the side wall (23), the side compartment protrusion (30c) is inserted into the side frame recess (51b); and the frame protrusion (52) is inserted into the frame recess (29). The features which are inserted into each other are compliant to each other in terms of cross section, and they complete each other. By means of this, the movement of the side edge (53) into the compartment (20), and the vertical and orthogonal movements thereof are restricted.

The arm placed to behind the side wall (23) is particularly called connection extension (55). When the door shelf (13) is connected to the door (10), the connection extension (55) stays between the side wall (23) and the door face (11). In order for the rear wall (24) to be formed in a very close or contacting manner to the door face (11), a housing (27) is provided for the connection extension (55) in the joining region of the rear wall (24) and of the side wall (23) of the compartment (20) (Figure 5). The rear wall (24) and the side wall (23) and the faces of the connection extension (55) placed to the housing (27), which face the outside of the compartment (20) are substantially aligned, or a slight difference occurs.

On the front wall (55a) of the connection extension (55), in other words, on the side of the compartment (20) facing the side wall (23), there is a support protrusion (55b). The support protrusion (55b) is a protrusion which is in semi-sphere or cut-sphere form. The support protrusion (55b) is provided in the region between the right and left edge of the front wall (55a) such that a specific clearance is provided between the edges and the support protrusion (55b). The side wall (23) of the compartment (20) is placed in the region between the support protrusion (55b) and the edge which is far from the compartment (20). By means of the support protrusion (55b), bending of the side wall (23) into the compartment (20) is prevented.

At the front end of the side edge (53), an edge extension (54) is provided in an orthogonal manner with respect to the side edge (53), in other words, an edge extension (54) is provided in a parallel manner with respect to the third edge (70). Said edge extension (54) is used for the connection provided between the third edge (70) and the side edge (53) as it will be described below.

On the face of the connection extension (55) facing the rear wall (24) of the compartment (20), a groove (58) is provided. Said groove (58) extends along the connection extension (55) for a specific distance. Therefore, it is in the form of a thin and long depression. The housing (27) is used for the connection of the rear profile (80) and the rear wall (24) as it will be described below.

On the rear wall (55f) of the connection extension (55) facing the door face (11), a connection element (56) is formed (Figure 3 and Figure 6). The connection element (56) is in the form of a hook in L-shape whose free end faces downwards. There is one connection element (56), however, there may be more than one connection element (56).

At the connection extension (55), a support element (57) is provided in a manner staying under the connection element (56). The support element (57) can be in the form of a linear extension (Figure 10) extending towards the door face (11) or in the form of a plate (Figure 3) extending towards the door face (11).

A dampening element (59) is fixed onto the connection extension (55). The dampening element (59) is in the form of a plate. The dampening element (59) is obtained from a material like plastic, etc. However, the dampening element (59) is bent in a manner having two flaps (59a, 59b) fixed onto the connection element plate (55c), where the connection element (56) is provided, such that a first flap (59a) extends to the rear wall (55f) of the connection extension (55) and the second flap (59b) extends from the connection extension (55) into the shelf opening (12) provided on the door face (11). The bending is realized with an angle of approximately 90 degrees. On the other hand, instead of bending, the two plates can be joined to each other in an inseparable manner (for instance, by means of plastic welding) in a manner forming said two flaps (59a, 59b). On the first and second flap (59b), there is one or more than one connection element (59d). The connection element (59d) may be an opening or a protrusion for a screw. On the first flap (59a), an opening is provided for a fixation element like screw. Thus, the dampening element (59) is connected to the connection extension (55). On the second flap (59b), two protrusions are provided which are placed to the two recesses (55d) provided on the connection element plate (55c). On said second flap (59b), three grabbing edges (59c) are formed which grab the connection element plate (55c) for providing a firmer connection. The grabbing edges (59c) grab the upper edge and the lower edge of the connection element plate (55c), and they grab the section,

provided between the connection element (56) and the support element (57), of the rear edge where the connection element (56) and the support element (57) exist.

A wall extension (24a) extends from the rear wall (24) of the compartment (20) towards the housing (27). The wall extension (24a) is integrated to the rear wall (24). The wall extension (24a) reaches a height which is equal to the height of the groove (58) together with the rear profile (80) placed onto the rear wall (24). Therefore, a clearance, which is equal in length to the clearance between the groove (58) and the base (21), is left between the wall extension (24a) and the base (21). Thus, the movement of the rear profile (80) in the vertical and orthogonal direction is restricted by the groove (58) and the rear wall (24). Accordingly, the width of the groove (58) is equal to the thickness of the rear profile (80). Thus, the frontal and rearward movement of the rear profile (80) is also restricted. Additionally, the screw, passing through the screw opening providing the connection of the dampening element (59) to the connection extension (55), extends up to the rear profile (80), and it exactly fixes the rear profile (80) to the connection extension (55) and thus, it fixes the rear profile (80) to the remaining section of the frame (50) (Figure 3).

In Figure 7, the view of the compartment (20) is given from the right side. The side edge (53) is not provided on the compartment (20). Therefore, the rear wall (24) of the compartment (20) can be seen. On the rear wall (24), the rear profile (80) is illustrated in a separate manner. The rear profile (80) is placed onto the rear wall (24) of the compartment (20). The rear profile (80) is in a plate form, and it is positioned on the rear wall (24) in an orthogonal manner, in other words, it is positioned such that the wide surfaces thereof face the front and rear sides. On the edge of the rear profile (80) facing the rear wall (24), a frame recess (51), particularly a rear frame recess (51c) is formed. Accordingly, on the upper edge of the rear wall (24) facing the rear profile (80), there is a compartment protrusion (30), particularly a rear compartment protrusion (30g). Said rear frame recess (51c) and the rear compartment protrusion (30g) are formed in a compliant manner and in a manner completing each other (Figure 7). The rear wall of the rear frame recess (51c) extends downwardly when compared with the front wall. Thus, the rear wall (24) which has the risk of bending outwards the compartment (20) due to the load exerted on the door shelf (13) can be supported in a more robust manner. The rear profile (80) extends along the rear wall (23) and along the wall extensions (24a). The reason for giving this name to the rear frame recess (51c) is the use of the rear profile (80) as a frame edge in possible embodiments. A frame recess (51) is formed

in the same manner at a rear profile (80) which is independent from the frame (50); and thereby the connection between the rear wall (24) and the frame recess (51) can be provided.

In Figure 8, the compartment (20) is illustrated and additionally, the third edge (70) is illustrated. The partial view of the compartment (20) is illustrated, in other words, only the front wall (22) and the left side wall (23) of the compartment (20) are illustrated. The third edge (70) of the frame (50) is obtained from a metal material or from a very resistant material. In the embodiments illustrated in the figures, the third edge (70) is metal (aluminum, etc.). The third edge (70) is a profile obtained by means of extrusion. However, it can also be obtained by means of a different method like injection molding known in the related art. The third edge (70) has a specific thickness. The third edge (70) has two mutual faces having a width which is wider than said thickness. One of said faces face frontally, and the other one faces the rear side. In other words, the face facing the rear side faces the door (10) and it is parallel or substantially parallel with respect to the door face (11). On the edge of the third edge (70) with respect to the front wall (22) of the compartment (20), there is a frame recess (51), in other words, there is a front frame recess (51a). The front frame recess (51a) is compliant to the above mentioned front compartment protrusion (30a). In the embodiment provided in Figure 8, since the third edge (70) is not obtained from a flexible material (metal, for instance, aluminum, steel, etc.), the connection between the front frame recess (51a) and the front compartment protrusion (30a) is realized by means of sliding process. In this process, the third edge (70) is provided such that the right or left end of the front compartment protrusion (30a) is inserted into the front frame recess (51a) through the opening provided at the opposite end of the front frame recess (51a) – for instance, the right end of the front compartment protrusion (30a) is inserted into the front frame recess (51a) through the left end of the front frame recess (51a). Afterwards, the third edge (70) is slid such that the front compartment protrusion (30a) is completely inserted into the front frame recess (51a). The third edge (70) comprises an edge recess (71) between the front frame recess (51a) and the upper edge thereof. The edge recess (71) may be a recess provided at the ends of the third edge (70) and having an end or a bottom. On the other hand, it may be in the form of a tunnel extending along the whole third edge (70) and formed at the two ends of the third edge (70). In the embodiment provided in the figures, the tunnel type, which is the second alternative, has been preferred. This is compliant to production by means of extrusion, and this provides advantage in the material costs. The abovementioned edge

extension (54), provided on the side edge (53), is placed to said edge recess (71). Therefore, the cross sectional shapes of the edge extension (54) and of the edge recess (71) are compliant to each other. After the edge extension (54) is completely inserted into the edge recess (71), a connection element opening (72), provided on the rear face of the third edge (70) facing the compartment (20) and opened to the edge recess (71), and a connection element opening (72), provided at the edge extension (54), are corresponded to each other. By means of this, the third edge (70) and the side edges (53) are connected to each other by means of a connection element (56) like a screw.

Second Embodiment:

In Figure 9, a possible second alternative of the third edge (70) is illustrated. In this alternative, the edge recess (71) is not in the form of a tunnel or a recess. The edge recess (71) is formed on the face of the third edge (70), facing into the compartment (20), in the shape of a channel leading to formation of an opening along the third edge (70). The edge extension (54), provided on the side edge (53), is obtained in a compliant manner to the cross section of said channel and in a manner corresponding to the edge recess (71).

In Figure 10, the right-top and rear side view of a second possible embodiment of the door shelf (13) is given where the door shelf (13) is in mounted form. In the second embodiment in the figure, the second alternative of the third edge (70) has been used. In fact, in the second embodiment presented in the figure, there is no rear profile. In the second embodiment, the compartment (20) is presented for providing an alternative about the third edge (70) and the side edges (53) of the frame (50). In a similar manner, the rear wall (24) of the second embodiment may comprise the rear compartment protrusion (30g). A rear profile (80) having a compliant rear frame recess (51c) can be positioned on the rear wall (24). Again, in a similar manner, the side edges (53) of the frame (50) may comprise a groove (58) for the rear profile (80).

In the second embodiment, the compartment (20) again comprises a base (21), a front wall (22), two mutual side walls (23), and a rear wall (24). On the rear wall (24), there is no rear profile (80) which belongs to the frame (50). Therefore, the frame (50) of the second embodiment has three edges, namely, it has two mutual side edges (53) and a third edge

(70). The third edge (70) has the abovementioned differences and similarities. The side edge (53) is again in L-shape. However, on the connection extension (55), there is no connection element plate (55c). Moreover, there is no dampening element (59). However, optionally, dampening element (59) can be positioned onto the face or faces of the connection extension (55) which is/are possible to contact the door face (11). Since there is no connection element plate (55c), the connection element (56) extends directly from the rear wall (55f) of the connection extension (55) towards the door (10). The connection element (56) is in the form of a hook whose end faces downwards in the same manner. In the second embodiment, the support element (57) is in the form of a small protrusion, when compared with the connection element (56), which is in the form of a pin or cut sphere, etc. formed on the rear wall (55f) of the connection extension (55). Additionally, the connection extension (55) comprises two fixation element channels (55e) for the fixation of the rear wall (24). The frame recess (51) and the frame protrusion (52) are the same as the ones in the first embodiments.

The greatest difference of the second embodiment is in the compartment (20). The base (21) and the rear wall (24) of the compartment (20) are integrated (Figure 12). The integrated structure is obtained from a metal material (aluminum, stainless steel, etc.). They can be obtained together during production, or they may be joined in an inseparable manner afterwards. On the right, left and front edge of the base (21), a wall housing (21a) is formed. The wall housing (21a) begins from the rear end of the right edge, and continues along the right edge, the front edge and the left edge, and continues until the rear end of the left edge. The wall housing (21a) is in the form of a recess formed on the right, left and front edge of the base (21) (Figure 13). Thus, when viewed from the lateral side, a cross section with C form is viewed. The open side of the cross section faces frontally at the front edge, and it faces to the right at the right edge, and it faces to the left at the left edge. At the bottom and top of the recess, there is the lower plate (21c) and the upper plate (21b). The plates are in the form of continuation of the lower and upper face of the base (21), and they are integrated with the base (21). Since the wall housing (21a) is obtained by means of carving the edges of the base (21) in a parallel manner with respect to the base (21). However, the upper plate (21b) extends at a shorter distance with respect to the lower plate (21c) on the wall housing (21a). Said short distance is equal to the thickness of the front wall (22) and the side walls (23) of the compartment (20). Thus, after the assembly of the walls (22, 23), the lower plate (21c) does not form protrusion outwards the door shelf (13). The rear wall (24) of the

compartment (20) does not comprise wall extension (24a); however, there are two fixation element housings (24b) at the right and at the left. The rear wall (24) is fixed to the frame (50) by means of a fixation element like screw, etc. placed to the fixation element channels (55e) provided on the fixation element housings (24b) and the connection extension (55).

The front wall (22) and the side walls (23) formed for the compartment (20) of the second embodiment are integrated. The compartment recess (29) and the compartment protrusions (30, 30a, 30c, 30g), provided at the upper edges of the walls (22, 23), are provided as in the first embodiment. However, at the lower edges, there is a base connection element (25) placed to the wall housing (21a) provided at the base (21) (Figure 11). The base connection element (25) is a plate which extends in a parallel manner with respect to the base (21) and in an orthogonal manner with respect to the walls (22, 23) in a manner placing the wall housing (21a). The single piece which is compliant to the wall housing (21a) extends along all the walls. The thickness thereof is equal to the inner height of the wall housing (21a). The compartment (20) walls (22, 23) which are in integrated form are obtained from a plastic material or a resistant material which can bend at a determined proportion and which returns to the prior position when the force exerted thereon is removed.

Third Embodiment:

The third embodiment of the door shelf (13) is substantially similar to the first embodiment. In Figure 14, the dismantled form of a door shelf (13), which is compliant to the possible third embodiment, is illustrated. The door shelf (13) is illustrated in a perspective manner from the rear side and from the left-upper direction.

The compartment (20) is one-piece and again, it has a base (21), side walls (23), a front wall (22) and a rear wall (24). However, the rear wall (24) and the side walls (23) are connected in an integrated manner. The side walls (23) and the rear wall (24) are joined by means of two housing walls (27a) formed in a vertical manner with respect to each other in a manner providing the housing (27). The wall extension (24a) of the rear wall (24) is also provided in this embodiment. However, the wall extension (24a) is formed along the rear wall (24) height. The wall extension (24a) extends towards the housing (27). Thus, it is placed into the groove (58) provided on the connection extension (55). The groove (58), provided at the connection extension (55) used in the third embodiment, extends until the lower end of the connection

extension (55) in a compliant manner with respect to the edge extension (54). Besides, the lower end thereof is opened to the space, and it has no lower wall (Figure 16).

The rear profile (80) has a rear frame recess (51c) whose open side faces the rear wall (24). The rear wall (24) has a compliant rear compartment protrusion (30g). The rear profile (80) extends along the rear wall (24), and it is placed to the groove (58). Afterwards, it is fixed together with the dampening element (59) by means of fixation element like a screw, etc.

The dampening element (59) comprises a resistance extension (59e), extending towards the connection extension (55), on the first flap (59a) which faces the connection extension (55) in a different manner (Figure 15). The resistance extension (59e) comprises walls surrounding a space which is in L form when viewed from the front side. Thus, the material consumed for the resistance extension (59e) is used less and the production cost has been kept low when compared with a full extension which is in L form. The resistance extension (59e) is placed into a resistance recess (60) provided on a rear wall (55f) which faces the dampening element (59) of the connection extension (55) in a manner corresponding thereto. The dampening element (59) comprises cutout around the connection elements (59d) provided on the second flap (59b). The cutout partially surrounds the connection element (59d). Thus, the plate, where the connection element (59d) is provided, bends in the section with no cutout, and it provides flexibility in the assembly of the connection element (59d).

The support element (57) provided on the connection extension (55) is in the form of a hook like the connection element (56). Therefore, both the support element (57) and the connection element (56) can fulfill its function.

The side compartment protrusion (30c) of the compartment (20) is in the form of a wall rising on the side wall (23) in order to provide a compartment recess (29) facing to the right or to the left outwards the compartment (20). The compartment recess (29) is provided on said wall (Figure 14 and Figure 15). The side compartment protrusion (30c) is provided at a region which is close to the rear end of the side wall (23), it is approximately provided at the rear half of the side wall (23). Accordingly, the side edge (53) has a frame protrusion (52) extending into the compartment (20) in a manner corresponding to the compartment recess (29) (Figure 16). The side compartment recess (29) and the frame protrusion (52) relatively have a very short thickness when compared with the length like a line.

The front compartment protrusion (30a) of the compartment (20) has the same form as the side compartment protrusion (30c) used in the first embodiment. Therefore, it is shaped by means of a first line (30d), a second line (30e) and a third line (30f) as described for the side compartment protrusion (30c) used in the first embodiment (Figure 14). The third edge (70) of the frame (50) is embodied by means of a front frame recess (51a) having similar cross sectional shape in a compliant manner to the front compartment protrusion (30a). The third edge (70) is connected to the front wall (22) by means of application again. However, the front compartment protrusion (30a) is thinner than the front frame recess (51a) in terms of cross section. It comprises only one balance element (30b) or it comprises pluralities of balance elements (30b) formed at specific intervals as exemplified in Figure 14. The balance element (30b) has the same cross section as the front frame recess (51a) in terms of cross section. Thus, when the third edge (70) is applied onto the front compartment protrusion (30a) in order to be connected to the compartment (20), less friction force is faced, and the application process is facilitated. Since it has the same cross section, the third edge (70) stops on the front wall (22) in a balanced manner; and it does not realize undesired bending towards the front side or towards the rear side due to the front frame protrusion (52) with thin cross section. Additionally, on the side edge (53), in addition to the edge extension (54) mentioned before, an additional edge extension (54) is provided. Said second edge extension (54) is inserted into the front frame recess (51a) of the third edge (70) through the right and left openings. Thus, it provides support for the balancing of the third edge (70). For this purpose, the second edge extension (54) has the same cross section as the front frame recess (51a).

Each feature used in the above mentioned embodiments can be used by means of compliant design harmonizing in one of the other embodiments except the described embodiment. For instance, the edge extension (54) described in the third embodiment and having the same cross section as the front compartment protrusion (30a) can also be used in the first embodiment. The only thing to be done is to harmonize the cross section form of said edge extension (54) to the cross sectional form of the front compartment protrusion (30a) as provided in the first embodiment. However, on the contrary, the front compartment protrusion (30a) of the first embodiment is formed in the form of cross section of the front compartment protrusion (30a) of the third embodiment; the edge extension (54) of the third embodiment can be used in the first embodiment in the same manner.

A further aspect is described as follows:

A home appliance comprises a door; and a door shelf positioned on a door face and has a compartment comprising a base, two mutual side walls, a front wall and a rear wall. It is particularly characterized in that the door shelf has a rear profile connected to the rear wall of the compartment. Thus, by means of a rear profile made of a material more resistant compared to the material of the rear wall, the deflection of the rear wall due to the load inside the compartment can be prevented.

In a possible embodiment, the rear profile is coupled to the remaining section of the door shelf by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the assembly of the remaining section of the door shelf and the rear profile can be facilitated. At the same time, this can reduce the labor, assembly and production cost. For instance, in a possible embodiment, the door shelf comprises a groove for the rear profile at a position which is close to the rear wall of the compartment.

In a possible embodiment, the rear wall of the compartment comprises a wall extension placed to the groove. Thus, the rear wall can further be supported against a possible physical deformation. This may extend the usage lifetime of the compartment.

In a possible embodiment, the door shelf has a frame, having at least three edges, which encircles an upper opening of the compartment and which is connected to the compartment. Thus, door shelves, having the same compartment but different frame, are obtained, and product variety can be provided.

In a possible embodiment, the frame and the compartment are connected to each other by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the assembly processes, which are required for obtaining door shelf, can be facilitated and accelerated. Moreover, since an external connection element is not used, the material and labor costs, thus the production costs can be kept low. For instance, the frame may comprise a frame recess providing connection to the compartment and having an open side facing into the compartment and/or downwardly in a manner facing a side wall of the compartment connected. In the same embodiment or in another possible embodiment, the frame may

comprise a frame protrusion providing connection to the compartment and having an open side facing into the compartment and/or towards a side wall of the compartment connected. In a possible embodiment, the compartment may comprise a compartment recess having an open side facing towards the frame and/or towards the outside of the compartment so that the compartment is connected to the frame. In the same embodiment or in another possible embodiment, the compartment may comprise a compartment protrusion towards the frame and/or towards outside of the compartment for providing connection to the frame.

The frame recess and the frame protrusion and the compartment recess and the compartment protrusion can be provided mutually in a compliant manner completing each other. Thus, they may form shape coupling or force coupling. For instance, they may be connected to each other by means of methods like engagement, locking or slider engagement.

In a possible embodiment, the frame has at least one connection element in order to carry the compartment, connected thereto, on the door. Thus, the load, occurring on the compartment, can be distributed through at least three walls of the compartment onto the edges of the frame carrying the compartment. By means of this, the load may be prevented from being accumulated at a specific point of the compartment and from leading to a possible physical deformation on the compartment. This may favorably affect the usage lifetime of the compartment. In other words, the usage lifetime of the compartment can be extended. Additionally, compartments with different designs are formed at the same frame, and the door shelf can be diversified without increasing complexity according to the brand or model.

In a possible embodiment, the frame comprises a connection extension which has connection element and which extends in a parallel manner with respect to the door face the door shelf is connected thereto. Thus, only the frame contacts the door and transmits the load to the door. This may prevent application of external and regional load onto the compartment and exert of force to the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment, the compartment comprises a housing for providing positioning of the connection extension. Thus, the connection extension can be prevented from protruding on the compartment or becoming an extra piece. The door shelf gets flush appearance.

Moreover, by means of the housing, it can be understood that the connection between the frame and the compartment is realized in a correct and compliant manner. In other words, the housing can be used as an assembly guide.

In a possible embodiment, the connection extension comprises a support protrusion which prevents bending of a wall of the compartment, which is adjacent to the connection extension, into the compartment. Thus, in compartment embodiments having no side wall connected to the rear wall or having no rear wall, the bending of the side wall inwards the compartment can be prevented. By means of this, the possible physical deteriorations which may occur on the compartment can be prevented.

In a possible embodiment, the frame may comprise a dampening element positioned on a face thereof contacting the door face. Thus, the dampening of the noise which may occur due to the contact between the door face and the frame can be provided. For instance, the noise resulting from the contact between the metal frame and the metal door face can be eliminated or relatively reduced by means of a dampening element made of a material like plastic, etc.

In a possible embodiment, the frame comprises two side edges forming two mutual edges of the frame, and a third edge extending between the side edges in a manner connected to the side edges. Thus, by means of the pieced frame, the connection between the frame and compartment can be facilitated. The frame may have different designs for different brands or models by means of diversifying of different pieces.

In a possible embodiment, the side edge has an L-form having a connection element and whose one arm forms an edge of the frame and whose other arm extends in a parallel manner with respect to the door face the door shelf is connected thereto. Thus, by means of a single piece, both the frame edge and the section providing the connection between the frame and the door, for instance, the above mentioned connection extension can be obtained.

In a possible embodiment, the third edge comprises an edge recess accommodating an edge extension provided on the side edge. Thus, the connection between the third edge and the side edges can be mechanically provided. There may remain no need for an additional fixation element. However, in a probable embodiment, the frame may comprise a fixation

element, for instance, a screw which fixes the edge extension of the side edge inside the edge recess of the third edge.

In a possible embodiment, the rear profile is coupled to the remaining section of the frame by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the load formed on the compartment can be distributed more on the frame since the rear profile functioning as a fourth edge may form a greater area for distributing the load. Moreover, the assembly of the remaining section of the frame and the rear profile can be facilitated. At the same time, this may reduce the labor, assembly and production cost. For instance, in a probable embodiment, the frame may comprise a groove for the rear profile at a position which is close to the rear wall of the compartment.

In a possible embodiment, the rear wall of the compartment may comprise a wall extension placed to the groove provided at the frame. Thus, the rear wall can be carried with the frame. By means of this, the load can be prevented from being accumulated at a specific point of the compartment and from leading to a physical deformation on the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment of the present invention, the connection element can be in hook-form placed to an opening provided on the door. Thus, the door shelf can be easily connected to the door. Moreover, the optional displacement of the door shelf can be easily realized by the user.

In a possible embodiment, the door shelf may comprise a support element contacting the door when the door shelf is on the door. Thus, the base of the door shelf fixed to the door by means of the connection element can be provided to be parallel to the floor. Due to the design of the connection element, the clearance, existing between the door shelf and the door, can be compensated.

The frame can be obtained from metal material, for instance from aluminum and/or zamak (zinc, aluminum, magnesium and copper alloy) by means of extrusion and/or metal injection. Moreover, the frame can also be produced from another material which has high resistance and which can resist the loads expected to be carried by the door shelf.

On the contrary, the compartment can be obtained from a polymer material except plastic or metal, or from any material known to be used in production of door shelf compartment in the related art.

A further aspect is described as follows:

A home appliance comprises a door; and a door shelf positioned on a door face and having a compartment and a frame which has at least three edges and which encircles an upper opening of the compartment and which is connected to the compartment; and two side edges forming the two mutual edges of the frame, and a third edge connected to the side edges and extending between the side edges. The present invention is particularly characterized in that the third edge comprises an edge recess accommodating an edge extension provided on the side edge. Thus, the connection between the third edge and the side edges can be provided in a mechanical and robust manner. There may remain no need for an additional fixation element. However, in a possible embodiment, the frame may comprise a fixation element, for instance, a screw which fixes the edge extension of the side edge inside the edge recess of the third edge. Moreover, by means of the multipart frame, the connection between the frame and the compartment can be facilitated. The frame may have different designs for different brands or models by diversifying of different pieces.

In a possible embodiment, the frame and the compartment are coupled to each other by means of at least one of shape coupling, force coupling, and adhesive coupling. Thus, the assembly processes required for obtaining the door shelf can be facilitated and accelerated. Moreover, since no external connection element is used, the material and labor costs, thus the production costs can be kept low. For instance, the frame may comprise a frame recess providing connection to the compartment and whose open side faces into the compartment and/or faces to a side wall of the compartment connected. In the same embodiment or in another possible embodiment, the frame may comprise a frame protrusion providing connection to the compartment and which extends into the compartment and/or towards a side wall of the compartment connected. In a possible embodiment, the compartment may comprise a compartment recess for providing connection with the frame and whose open side faces towards the frame and/or towards the outside of the compartment. In the same embodiment or in another possible embodiment, the compartment may comprise a

compartment protrusion towards the frame and/or towards outside of the compartment for providing connection to the frame.

The frame recess and the frame protrusion and the compartment recess and the compartment protrusion can be provided mutually in a compliant manner completing each other. Thus, they may form shape coupling or force coupling. For instance, they may be connected to each other by means of methods like engagement, locking or slider engagement.

In a possible embodiment, the frame comprises at least one connection element in order to carry the compartment, connected to the frame, on the door. Thus, the load existing on the compartment can be distributed to the edges of the frame, carrying the compartment, through at least three walls of the compartment. By means of this, the load may be prevented from being accumulated at a specific point of the compartment and leading to a possible physical deformation on the compartment. This may favorably affect the usage lifetime of the compartment. In other words, the usage lifetime of the compartment can be extended. Additionally, compartments with different designs are formed at the same frame, and the door shelf can be diversified without increasing complexity according to the brand or model.

In a possible embodiment, the frame comprises a connection extension having connection element and extending in a parallel manner with respect to the door face whereto the door shelf is connected. Thus, only the frame contacts the door and transmits the load to the door. This may prevent application of external and regional load onto the compartment and exert of force to the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment, the compartment comprises a housing wherein the connection extension is positioned. Thus, the connection extension can be prevented from protruding on the compartment or becoming an extra piece. The door shelf gets a flush appearance. Moreover, by means of the housing, it can be understood that the connection between the frame and the compartment is realized in a correct and compliant manner. In other words, the housing can be used as an assembly guide.

In a possible embodiment, the connection extension comprises a support protrusion which prevents bending of a wall of the compartment, which is adjacent to the connection extension,

into the compartment. Thus, in compartment embodiments having no side wall connected to the rear wall or having no rear wall, the bending of the side wall inwards the compartment can be prevented. By means of this, the possible physical deteriorations which may occur on the compartment can be prevented.

In a possible embodiment, the frame may comprise a dampening element positioned on a face thereof contacting the door face. Thus, the noise which may occur due to the contact between the door face and the frame is dampened. For instance, the noise resulting from the contact between the metal frame and the metal door face can be eliminated or relatively reduced by means of a dampening element made of a material like plastic, etc.

In a possible embodiment, the side edge is in L-form having connection element and whose one arm forms an edge of the frame and whose other arm extends in a parallel manner with respect to the door face whereto the door shelf is connected. Thus, by means of a single piece, both the frame edge and the section providing the connection between the frame and the door, for instance, the above mentioned connection extension can be obtained.

In a possible embodiment, the compartment comprises a base, two mutual side walls, and a front wall. Thus, a compartment can be obtained without consuming material for forming the rear wall. After the door shelf is connected to the door, the related door face can form the rear wall of the compartment. Thus, an item, placed into the compartment, can be kept inside the compartment.

In a possible embodiment, the compartment comprises a rear wall. Thus, in the embodiments having clearance between the door and the door shelf, an item, placed into the compartment, can be kept inside the compartment.

In a possible embodiment, the door shelf has a rear profile connected to the rear wall of the compartment. Thus, by means of a rear profile which is to be obtained from a material more resistant compared to the material of the rear wall, the deflection of the rear wall due to the load inside the compartment can be prevented.

In a possible embodiment, the rear profile is coupled to the remaining section of the door shelf by means of at least one of shape coupling, force coupling, and adhesive coupling.

Thus, the load, occurring on the compartment, can be distributed more on the frame as the rear profile functioning as a fourth edge may form a greater area for distributing the load. Moreover, the assembly of the remaining section of the frame and the rear profile can be facilitated. At the same time, this may reduce the labor, assembly and production cost. For instance, in a probable embodiment, the frame may comprise a groove for the rear profile at a position which is close to the rear wall of the compartment.

In a possible embodiment, the rear wall of the compartment may comprise a wall extension placed to the groove provided at the frame. Thus, the rear wall can be carried with the frame. By means of this, the load can be prevented from being accumulated at a specific point of the compartment and from leading to a physical deformation on the compartment. This may extend the usage lifetime of the compartment.

In a possible embodiment, the connection element can be in hook-form placed to an opening provided on the door. Thus, the door shelf can be easily connected to the door. Moreover, the optional displacement of the door shelf can be easily realized by the user.

In a possible embodiment, the door shelf may comprise a support element contacting the door when the door shelf is on the door. Thus, the base of the door shelf fixed to the door by means of the connection element can be provided to be parallel to the floor. Due to the design of the connection element, the clearance, existing between the door shelf and the door, can be compensated.

The frame can be obtained from metal material, for instance from aluminum and/or zamak (zinc, aluminum, magnesium and copper alloy) by means of extrusion and/or metal injection. Moreover, the frame can also be produced from another material having increased resistance and resistant against the loads expected to be carried by the door shelf.

On the contrary, the compartment can be obtained from a polymer material except plastic or metal, or from any material known to be used in production of door shelf compartment in the related art.

REFERENCE NUMBERS

- 1. Home appliance
- 10. Door
- 11. Door face
- 12. Shelf opening
- 13. Door shelf
- 20. Compartment
- 21. Base
 - 21a. Wall housing
 - 21b. Upper plate
 - 21c. Lower plate
- 22. Front wall
- 23. Side wall
- 24. Rear wall
 - 24a. Wall extension
 - 24b. Fixation element housing
- 25. Base connection element
- 26. Upper opening
- 27. Housing
 - 27a. Housing wall
- 29. Compartment recess
- 30. Compartment protrusion
 - 30a. Front compartment protrusion
 - 30b. Balance element
 - 30c. Side compartment protrusion
 - 30d. First line
 - 30e. Second line
 - 30f. Third line
 - 30g. Rear compartment protrusion
- 50. Frame
- 51. Frame recess
 - 51a. Front frame recess
 - 51b. Side frame recess
 - 51c. Rear frame recess
- 52. Frame protrusion
- 53. Side edge
- 54. Edge extension
- 55. Connection extension
 - 55a. Front wall
 - 55b. Support protrusion
 - 55c. Connection element plate
 - 55d. Recess
 - 55e. Fixation element channel
 - 55f. Rear wall
- 56. Connection element
- 57. Support element
- 58. Groove
- 59. Dampening element
 - 59a. First flap
 - 59b. Second flap
 - 59c. Grabbing edge
 - 59d. Connection element
 - 59e. Resistance extension
- 60. Resistance recess
- 70. Third edge
- 71. Edge recess
- 72. Connection element opening
- 80. Rear profile

CLAIMS

1. A home appliance (1), particularly a refrigerator, comprising a door (10); and a door shelf (13) positioned on a door face (11) and having a compartment (20) and a frame (50) which has at least three edges and which encircles an upper opening (26) of the compartment (20) and which is connected to the compartment (20); **characterized** in that the frame (50) has at least one connection element (56) for providing supporting of the compartment (20), connected to the frame (50), on the door (10).
2. A home appliance (1) according to Claim 1, wherein the frame (50) and the compartment (20) are coupled to each other by means of at least one of shape coupling, force coupling, and adhesive coupling.
3. A home appliance (1) according to Claim 1 or 2, wherein the frame (50) comprises a connection extension (55) having connection element (56) and extending in a parallel manner with respect to the door face (11) whereto the door shelf (13) is connected.
4. A home appliance (1) according to Claim 3, wherein the compartment (20) comprises a housing (27) wherein the connection extension (55) is positioned.
5. A home appliance (1) according to Claim 3 or 4, wherein the connection extension (55) comprises a support protrusion (55b) which prevents bending of a wall of the compartment (20), which is adjacent to the connection extension (55), inwards the compartment (20).
6. A home appliance (1) according to any one of the preceding claims, wherein the frame (50) comprises a frame recess (51) which provides connection of the frame (50) to the compartment (20) and which faces downwardly such that the open side faces into the compartment (20) and/or such that the open side faces a wall of the compartment (20) whereto the frame (50) is connected.
7. A home appliance (1) according to any one of the preceding claims, wherein the frame (50) comprises a frame protrusion (52) which provides connection to the compartment (20) and which extends inwards the compartment (20) and/or which extends towards a wall of the compartment (20) the frame (50) is connected thereto.

- 8.** A home appliance (1) according to any one of the preceding claims, wherein in order to provide the connection of the compartment (20) to the frame (50), a compartment recess (29) is provided whose open side faces towards the frame (50) and/or whose open side faces towards outside of the compartment (20).
- 9.** A home appliance (1) according to any one of the preceding claims, wherein in order to provide the connection of the compartment (20) to the frame (50), a compartment protrusion (30) is provided which extends towards the frame (50) and/or which extends towards outside of the frame (20).
- 10.** A home appliance (1) according to any one of the preceding claims, wherein the frame (50) comprises a dampening element (59) positioned on a face of the frame (50) which contacts the door face (11).
- 11.** A home appliance (1) according to any one of the preceding claims, wherein the frame (50) comprises two side edges (53) forming the two mutual edges, and a third edge (70) connected to the side edges (53) and extending between the side edges (53).
- 12.** A home appliance (1) according to Claim 11, wherein the side edge (53) is in L-form having connection element (56) and whose one arm forms an edge of the frame (50) and whose other arm extends in a parallel manner with respect to the door face (11) whereto the door shelf (13) is connected.
- 13.** A home appliance (1) according to Claim 11 or 12, wherein the third edge (70) comprises an edge recess (71) which accommodates an edge protrusion (54) provided on the side edge (53).
- 14.** A home appliance (1) according to any one of the preceding claims, wherein the compartment (20) comprises a base (21), two mutual side walls (23), and a front wall (22).
- 15.** A home appliance (1) according to any one of the preceding claims, wherein the compartment (20) comprises a rear wall (24).

16. A home appliance (1) according to Claim 15, wherein the door shelf (13) comprises a rear profile (80) connected to the rear wall (24) of the compartment (20).

17. A home appliance (1) according to Claim 16, wherein the rear profile (80) is connected to the remaining section of the frame (50) by means of at least one of shape coupling, force coupling, and adhesive coupling.

18. A home appliance (1) according to Claim 16 or 17, wherein the frame (50) comprises a groove (58) for the rear profile (80) at a position which is close to the rear wall (24) of the compartment (20).

19. A home appliance (1) according to Claim 18, wherein the rear wall (24) of the compartment (20) comprises a wall extension (24a) placed to the groove (58) provided in the frame (50).

20. A home appliance (1) according to any one of the preceding claims, wherein the connection element (56) is in the form of a hook placed to a shelf opening (12) provided on the door (10).

21. A home appliance (1) according to any one of the preceding claims, wherein the door shelf (13) comprises a support element (57) which contacts the door (10) when it is on the door (10).

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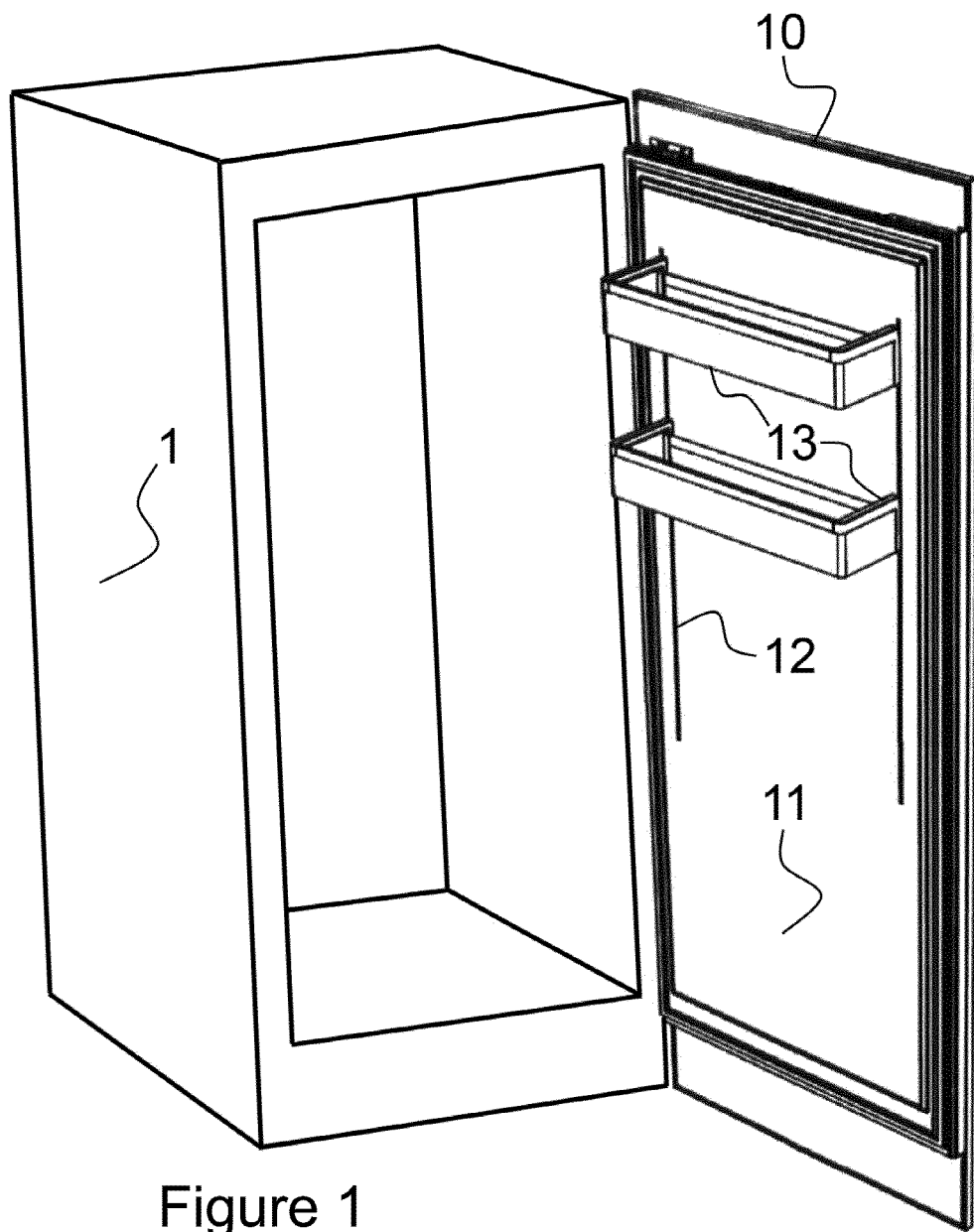


Figure 1

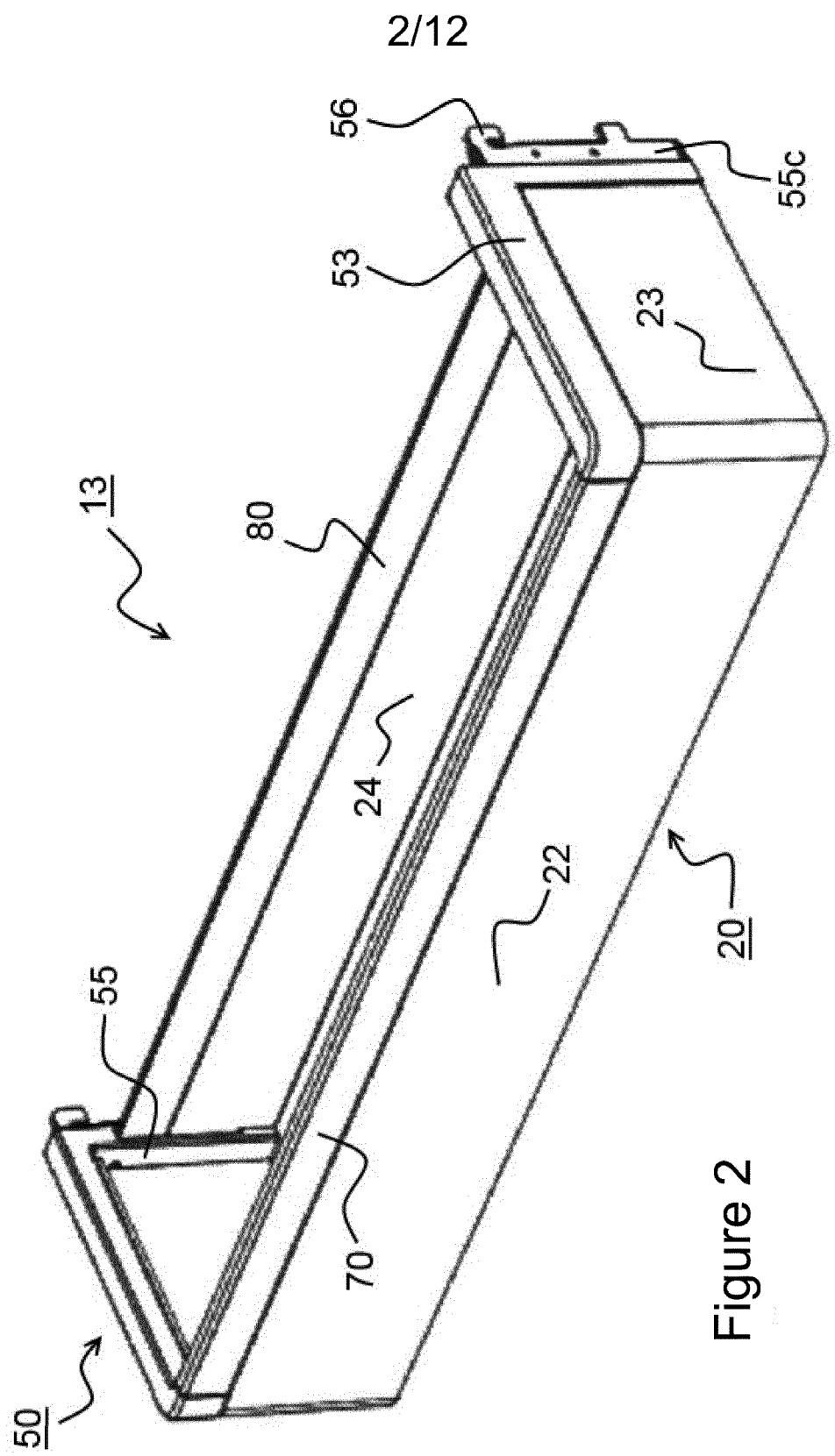
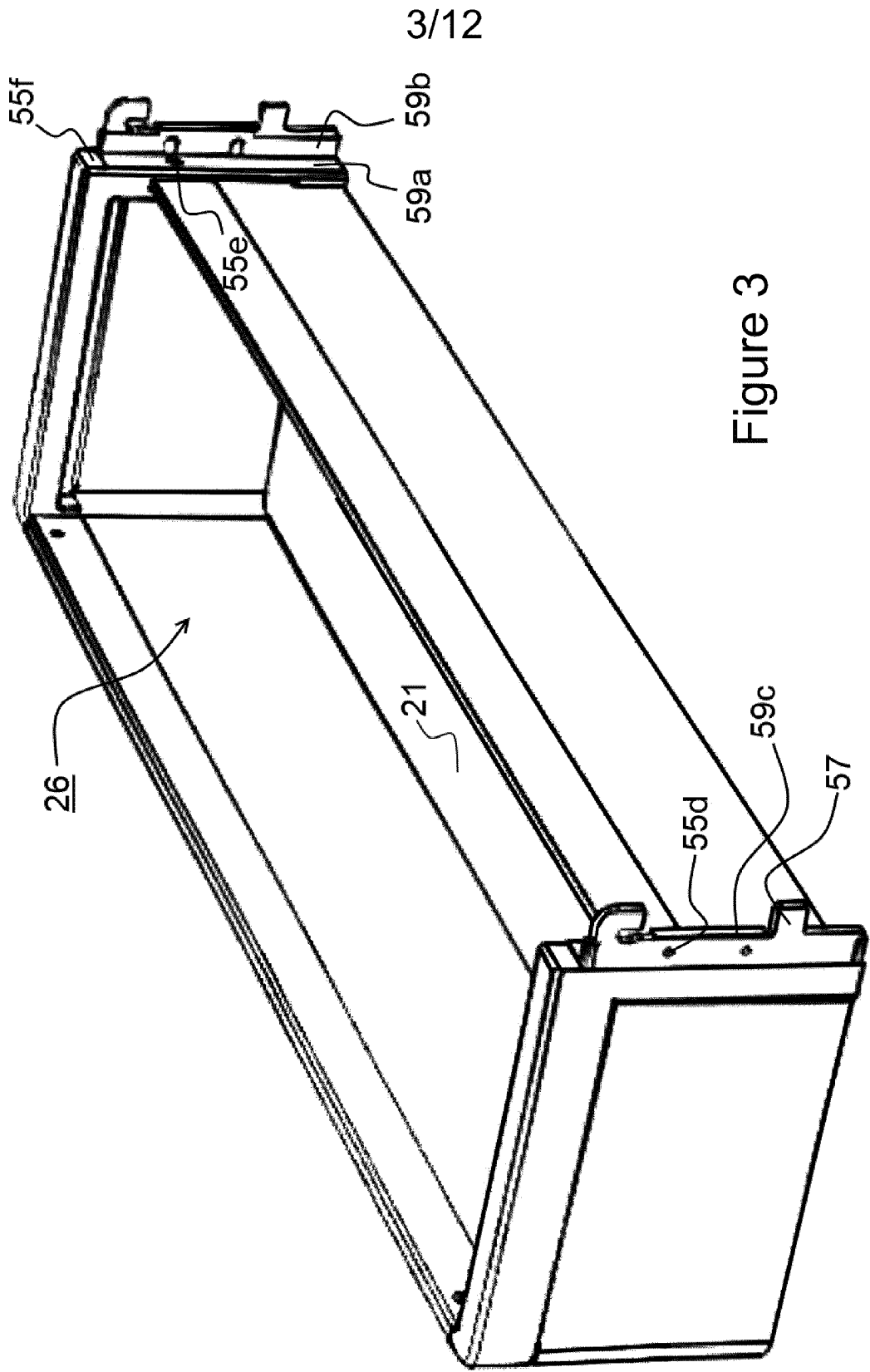


Figure 2



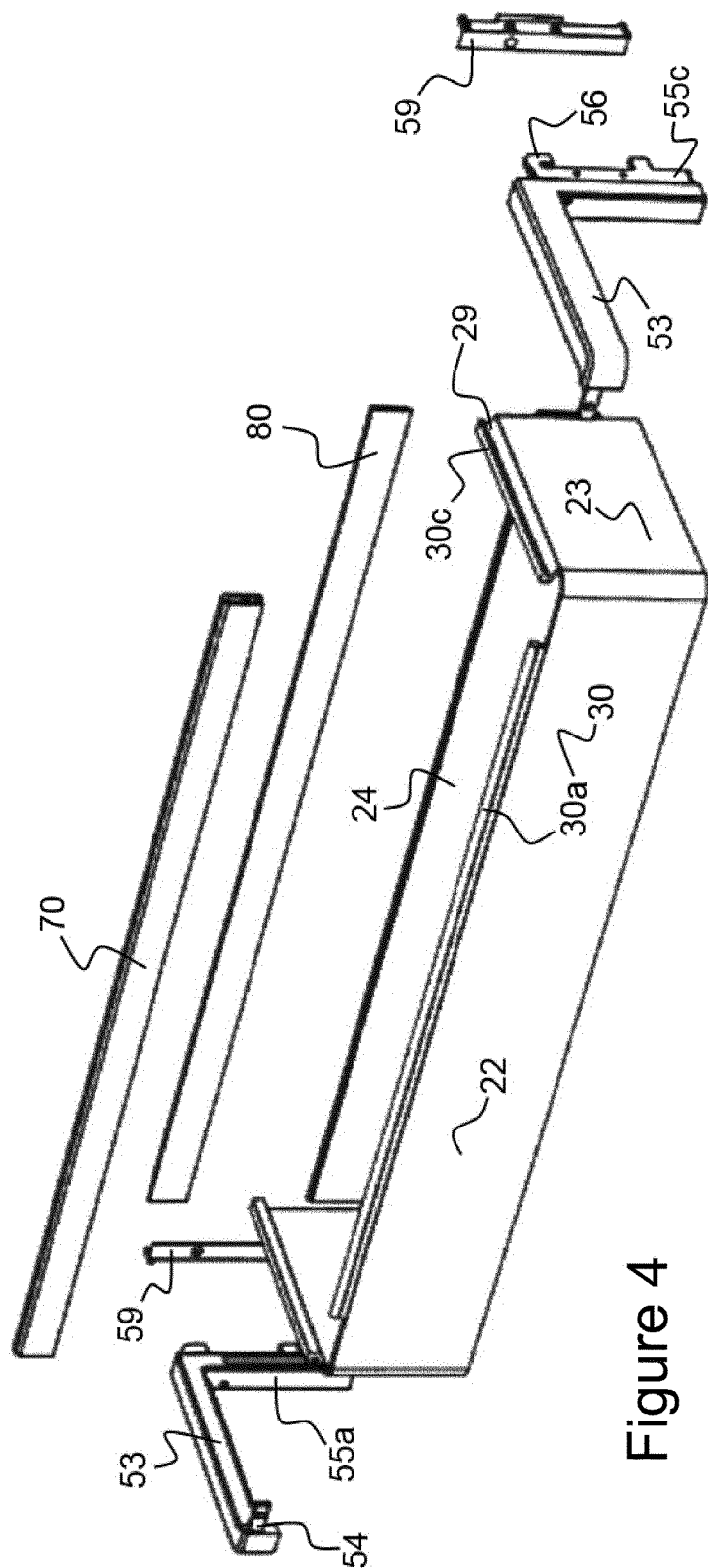
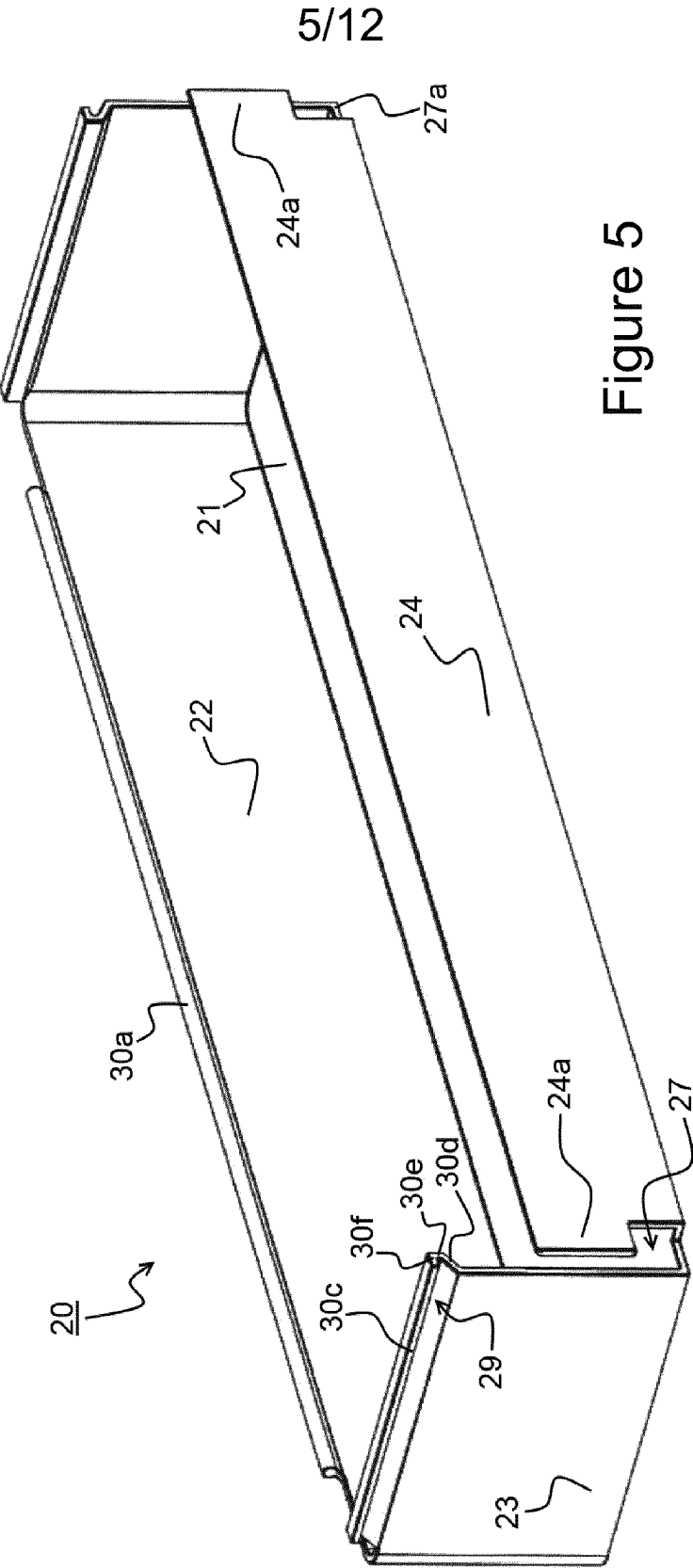


Figure 4



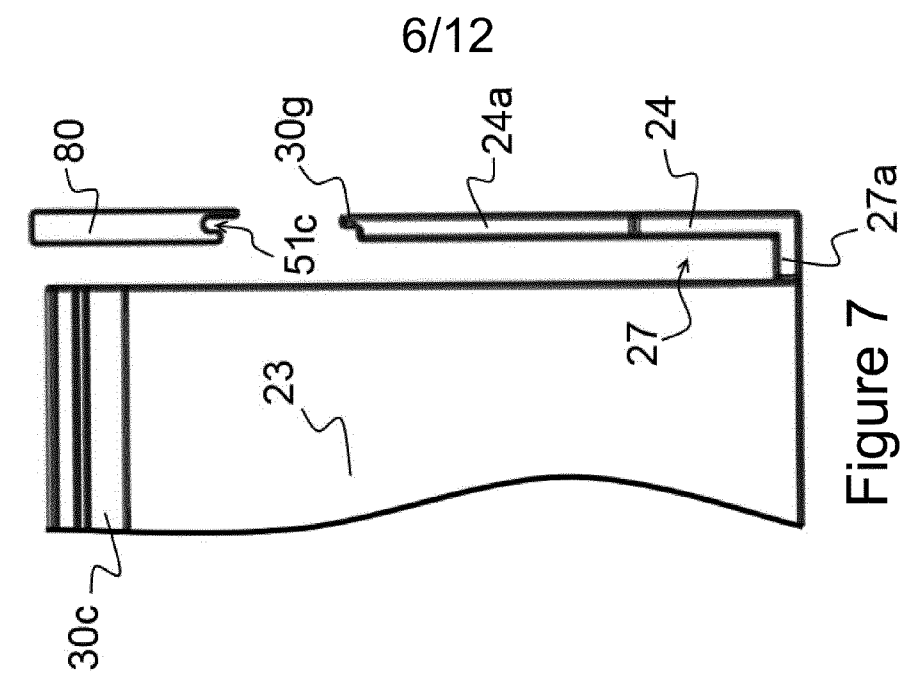


Figure 7

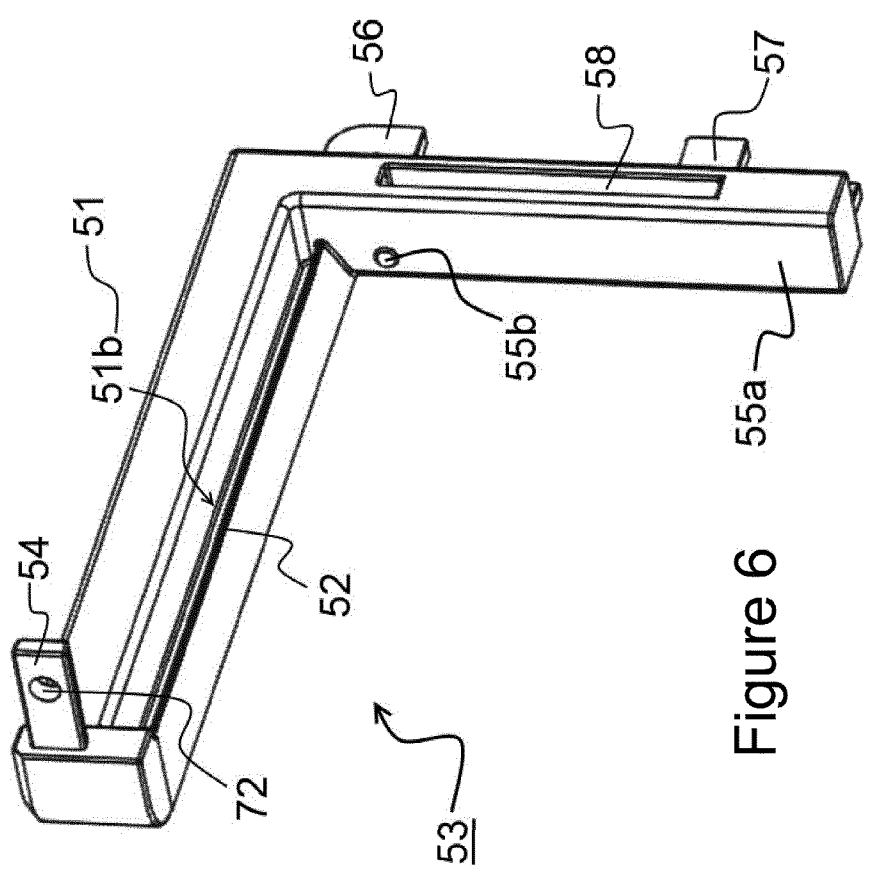


Figure 6

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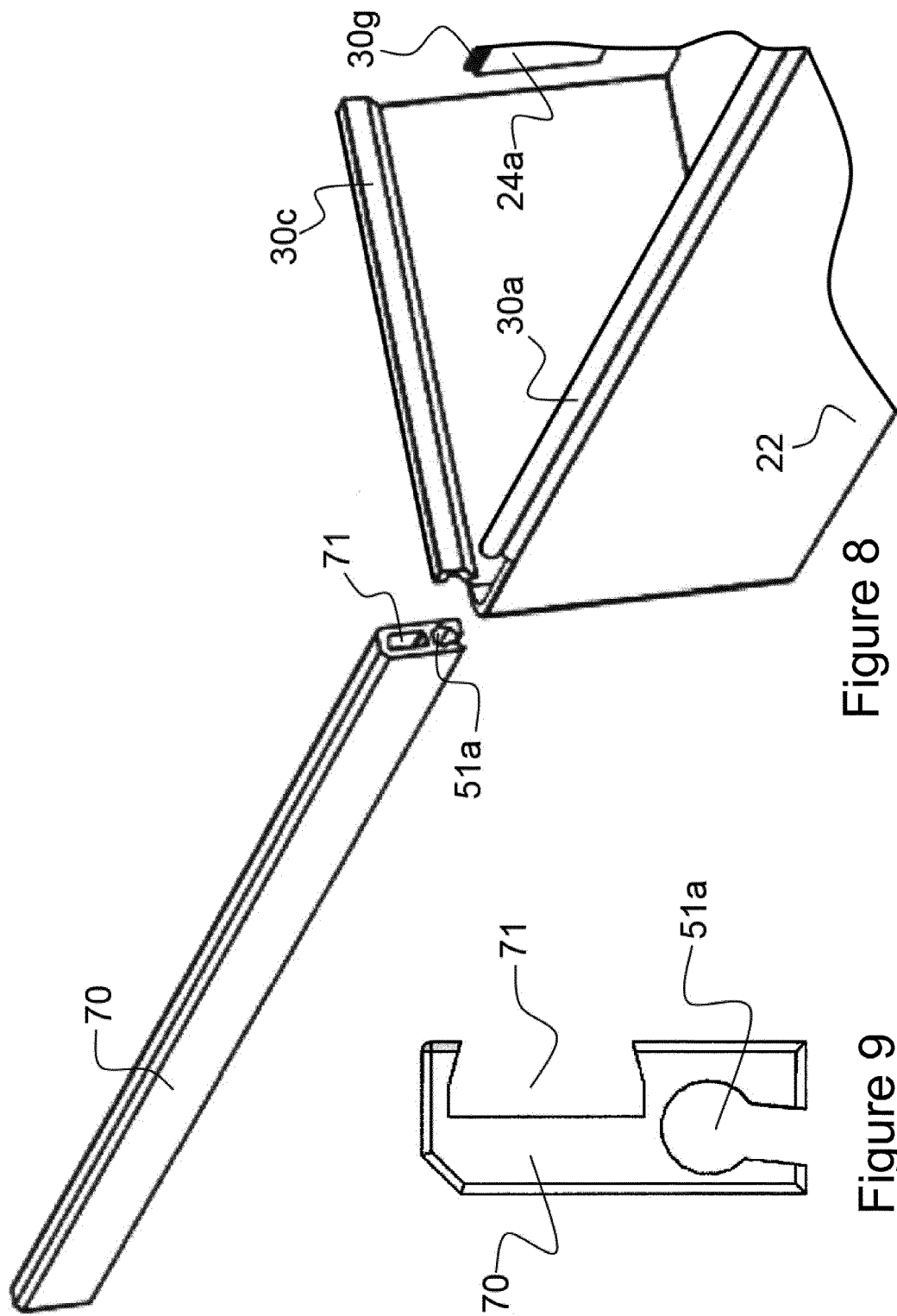


Figure 8

Figure 9

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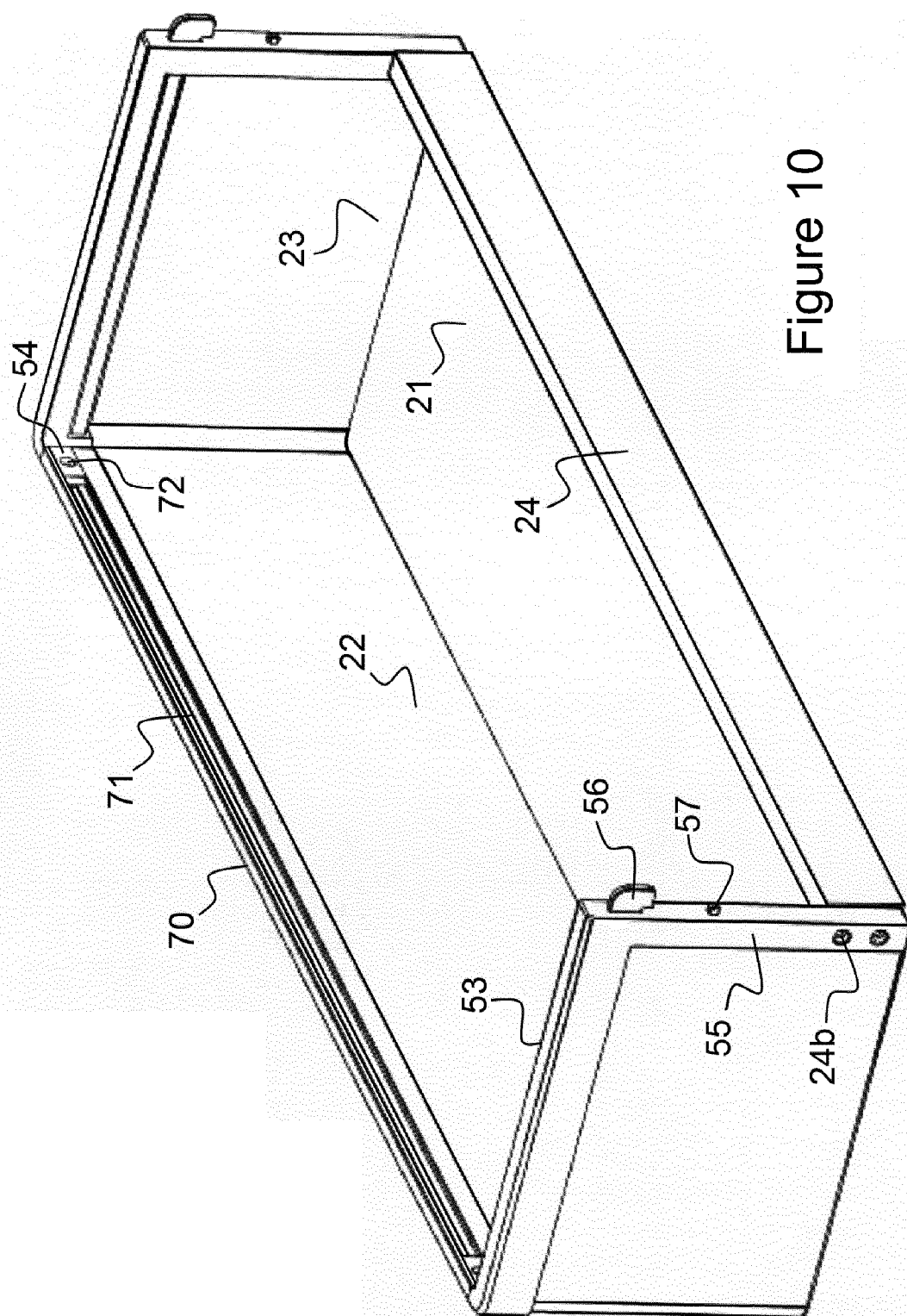
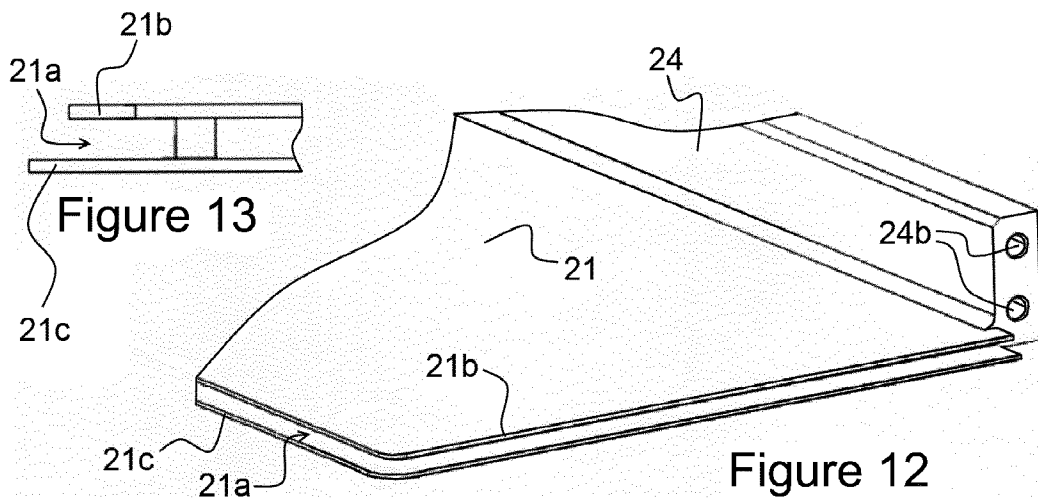
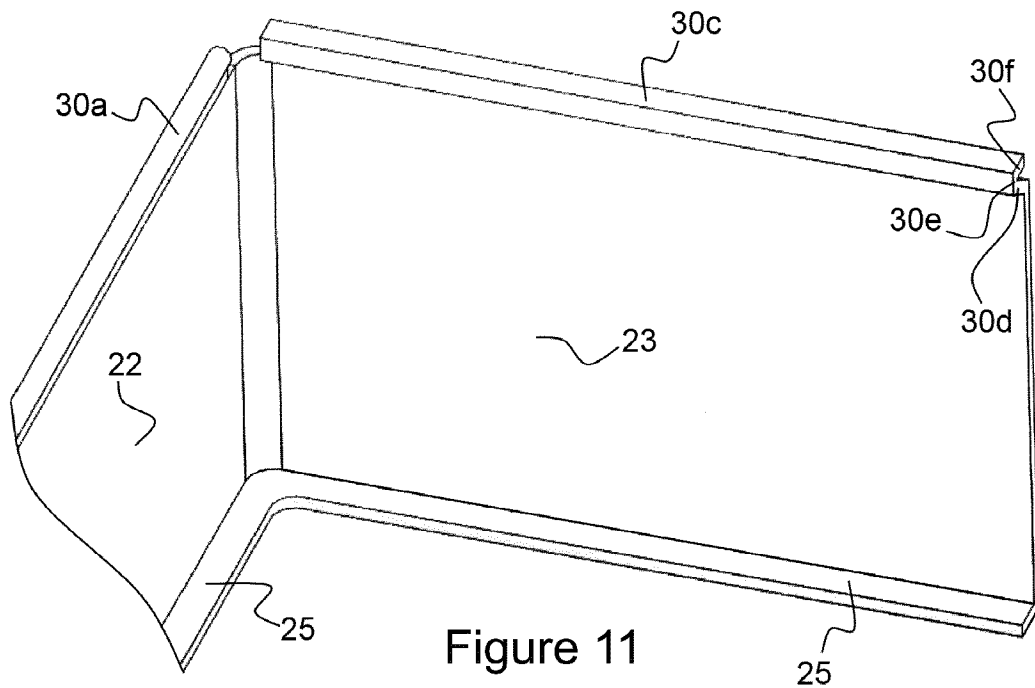


Figure 10

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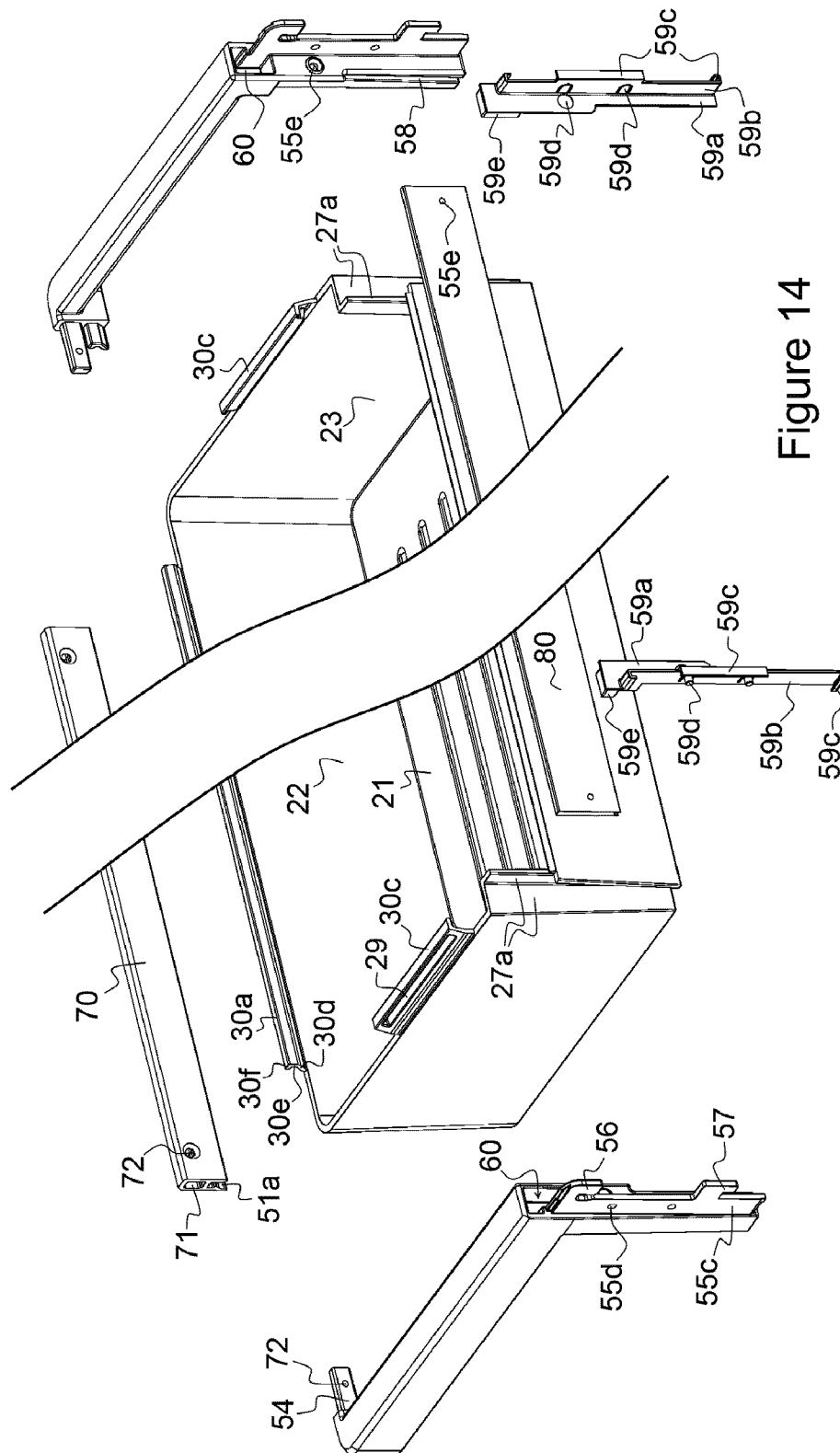


Figure 14

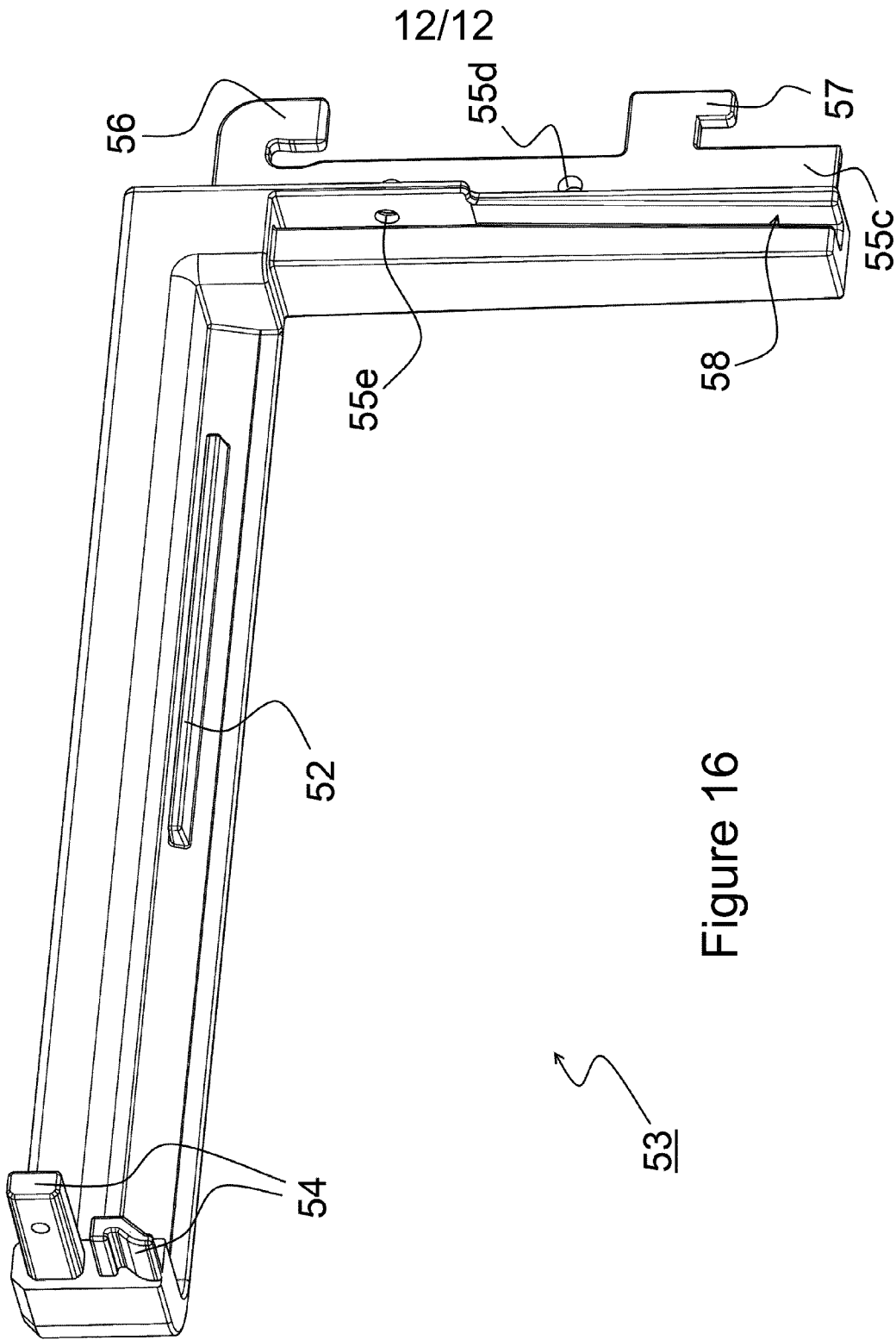


Figure 16

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/079857

A. CLASSIFICATION OF SUBJECT MATTER

INV. F25D23/02 F25D23/04 F25D25/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 10 2007 005951 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; MIELE & CIE [DE]) 7 August 2008 (2008-08-07) paragraphs [0022] - [0040]; figures 1-6 -----	1-21
X	DE 10 2009 028435 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 17 February 2011 (2011-02-17) paragraphs [0045] - [0064]; figures 1-16 -----	1,2,6,7, 9,11-15
X	DE 10 2012 223118 A1 (BSH BOSCH UND SIEMENS HAUSGERÄTE GMBH [DE]) 18 June 2014 (2014-06-18) paragraphs [0032] - [0061]; figures 1-7 -----	1,2,6-9, 11,14-16



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

23 February 2016

Date of mailing of the international search report

07/03/2016

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Kolev, Ivelin

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2015/079857

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102007005951 A1	07-08-2008	CN 101627270 A	13-01-2010
		DE 102007005951 A1	07-08-2008
		EP 2118595 A1	18-11-2009
		RU 2009130060 A	20-03-2011
		US 2010109496 A1	06-05-2010
		WO 2008095775 A1	14-08-2008

DE 102009028435 A1	17-02-2011	CN 102472556 A	23-05-2012
		DE 102009028435 A1	17-02-2011
		EP 2464926 A2	20-06-2012
		RU 2012105351 A	20-09-2013
		WO 2011018344 A2	17-02-2011

DE 102012223118 A1	18-06-2014	CN 104995469 A	21-10-2015
		DE 102012223118 A1	18-06-2014
		EP 2932173 A1	21-10-2015
		WO 2014090726 A1	19-06-2014
