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(54) **SHELF DEVICE**

REGALVORRICHTUNG

DISPOSITIF À ÉTAGÈRES

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to refrigeration technology, and more particularly, the present invention relates to a shelf device which is suitable to be fitted onto ribs of an inner shell of a refrigeration appliance.

BACKGROUND

[0002] With the development of science and technology, the configuration of a refrigeration appliance such as a refrigerator has changed dramatically. In addition to traditional "single-door refrigerator" and "double-door refrigerator", there are "side-by-side door refrigerator", "three-door refrigerator", "multiple-door refrigerator" and the like on sale in the market. In order to hold foods in a preservation chamber (a refrigerating chamber) of the refrigerator for a predetermined period, a plurality of holding plates are provided in the preservation chamber to hold the foods on the holding plates. Generally, provided on opposite side walls of an inner shell of the refrigerator are a plurality of ribs which are arranged at the same interval one above another. Usually, the ribs can be once-shaped by deep drawing. Each pair of ribs are located on the opposite side walls of the inner shell of the refrigerator and extend in a forward and backward direction. By placing the holding plates directly on the ribs of the inner shell (that is, by supporting the holding plates on the ribs of the inner shell), the holding plates are mounted within the inner shell of the refrigerator for holding foods thereon. In this way, a user can conveniently push or pull holding plates in a horizontal direction so as to store foods.

[0003] At present, the holding plate is designed in various ways. Figure 1 shows a holding plate used in the prior art. This conventional holding plate comprises a glass plate 10 and a frame 12. As shown in figure 1, the frame 12 envelopes an edge of the glass plate 10 as an outer frame. The frame 12 is inject-molded by plastic. The glass plate 10 is bonded closely with the frame 12 via bonding substance such as glue.

[0004] Usually, in consideration of vacuum-formation of the inner shell of the refrigerator, front and rear ends of the inner shell have a drafting angle. Therefore, in the case that a rectangular holding plate of glass is used, the front section of the holding plate will shake and tip over easily due to the large gap between it and the corresponding side wall of the inner shell. In order to prevent the holding plate from shaking, which is caused by a large gap between the front section of the holding plate and the side wall of the refrigerator, and to prevent the holding plate from tipping over when a user's hand touches the holding plate by mistake, a protruding structure 14 can be additionally provided at each of both sides of the front end of the holding plate so as to reduce the gap between the holding plate and the corresponding side wall of the

inner shell. Furthermore, in view of the above holding plate 1 which can be drawn forward and backward, in order to prevent the holding plate 1 from tipping over during it is drawn, a portion of the rear end of the holding plate 1 adjacent the rear wall of the refrigerator is provided with a hook 16.

[0005] However, concerning the holding plate shown in figure 1, firstly, it is not suitable to bond the glass plate 10 with the frame 12 via glue so as to secure them together, because it is uneasy to find a glue which can satisfy food-grade requirements. Secondly, the holding plate works in an environment of low temperature and high humidity for a long period. In this environment, the glue comes unglued easily, which may cause disengagement of the glass plate 10 from the frame 12. Moreover, in order to prevent the holding plate from shaking caused by the gap formed by the drafting angle, the protruding structure 14 is additionally provided at each of both sides of the front end of the holding plate 1. However, in actual manufacturing, for aesthetic purpose, the protruding structure 14 will not be configured in such a way that a portion of it adjacent the refrigerator door is at a high position and a portion of it far away from the refrigerator is at a low position. Therefore, actually, the holding plate 1 with such a protruding structure 14 is not joined to the side wall of the refrigerator in a complete abutment manner. Thus the case that the holding plate shakes and the holding plate tips over by the mistaken touching of the hand still exists. Furthermore, it is deficient to prevent the holding plate from tipping over in drawing it only via the hook 16, because the contact area between the hook 16 and the corresponding rib of the inner shell is small in pushing or pulling the holding plate. In this way, it is difficult to completely prevent the holding plate 1 from tipping over in pushing or pulling it. Moreover, it is unattractive for the holding plate 1 to prevent it from tipping over using the hook 16, and the hook 16 breaks easily.

[0006] Currently, in order to satisfy the requirement of high-end refrigerator markets, the frame of the holding plate is made of metal, instead of plastic as shown in figure 1. As shown in figure 2 which shows a further holding plate 2 according to the prior art, only a part of the holding plate 2 is shown in this figure for clarity. A metal frame 22 is used to secure a glass plate 20. In order to prevent items placed on the holding plate from falling off in pushing or pulling it and to ensure a good circulation of cold air in the entire refrigerating chamber, a steel wire 24 is provided at a rear end portion of the holding plate 2 adjacent the rear wall of the refrigerator. The steel wire 24 is fixed directly in a cylindrical hole integrated within the metal frame 22.

[0007] However, in the case that the steel wire 24 is secured with the metal frame 22 in the above-mentioned way, it is difficult to locate the steel wire 24. Moreover, once the steel wire 24 is secured in the metal frame 22, it is difficult to detach the steel wire from the metal frame.

[0008] Chinese Patent Application No. 00107237.4 discloses a holding plate for a refrigerator, which however

cannot solve the above technical problems.

[0009] Document DE 10 2008 040331 A1 discloses a shelf device according to the preamble of claim 1.

SUMMARY OF THE INVENTION

[0010] It is an object of the present invention to provide a shelf device so as to solve the technical problem in the prior art that the shelf device shakes and tips over easily.

[0011] In order to solve the above technical problems, the present invention provides a shelf device according to claim 1.

[0012] Alternatively, the surface of the first side or the second side of the frame is provided with a first locating hole adjacent the surface of the first end, the positioning member further comprises a first locating part connecting with the snapping portion, the first locating part has a first elastic portion thereon, a first protruding post is provided on the first elastic portion, and the first protruding post is in cooperation with the first locating hole.

[0013] Alternatively, that the positioning member is made of plastic, and the frame is made of aluminum alloy.

[0014] Alternatively, the first assembling portion is embodied as a first groove whose bottom is W-shaped.

[0015] Alternatively, the second assembling portion is embodied as a second groove extending through the surface of the second end, and the frame is slidably fitted to the corresponding rib of the inner shell via the second groove.

[0016] Alternatively, the shelf device further comprises a metal bar and a connecting member, the connecting member is inserted into the second groove from the surface of the second end, and the connecting member has a connection hole through which the metal bar is inserted.

[0017] Alternatively, the connecting member comprises a connection part and a second locating part, the connection part and the second locating part are connected together in an L-shape, and the connection hole is provided in the connection part.

[0018] Alternatively, the surface of the first or second side of the frame is provided with a second locating hole adjacent the surface of the second end, the second locating part has a second elastic portion thereon, a second protruding post is provided on the second elastic portion, and the second protruding post is in cooperation with the second locating hole.

[0019] Alternatively, the connecting member is made of plastic.

[0020] In order to solve the above technical problems, the present invention also provides a refrigeration appliance comprising the above-mentioned shelf device.

[0021] In comparison with the prior art, the technical solutions according to the present invention have the following advantages.

[0022] Since the positioning member is used to secure the shelf device, more particularly, since the positioning member is inserted into the first inserting portion provided at the first end of the frame and the snapping portion of

the positioning member is snapped with the corresponding rib of the inner shell, the shelf device is prevented from shaking and tipping over. Furthermore, in view of inner shells having different drafting angles, the snapping portion of the positioning member can be embodied in different dimensions such that a perfect abutment between the positioning member and the corresponding rib of the inner shell can be achieved. Compared with the conventional technical solution in which the protruding structure is provided directly at the front end of the frame, the shelf device can be well prevented from shaking and tipping over by adopting the positioning member to secure the shelf device. Moreover, the positioning member is inserted in the first inserting portion of the frame and thus is invisible. In contrast of the protruding structure, a pleasing appearance can be achieved.

[0023] Since the elastic portion is provided on the positioning member and the first protruding post is provided on the first elastic portion as well as the first locating hole in cooperation with the first protruding post is provided on the frame, the positioning member and the frame are secured together to prevent the shelf device from shaking.

[0024] The shelf panel can be fitted conveniently to the frame via the first assembling portion of the frame, and the first assembling portion is embodied as the groove whose bottom is W-shaped, such that the shelf panel can be connected closely with the frame. With respect to the prior art, it is unnecessary to use the food-grade glue. Therefore, the case that the frame and the shelf panel are bonded together via adhesive substance such as glue is avoided. The problem that the frame will be detached from the shelf panel due to the glue ungluing in the environment of low temperature and high humidity will not exist.

[0025] The second assembling portion in cooperation the corresponding rib of the inner shell is in the shape of a groove, such that the contacting area between it and the corresponding rib of the inner shell is enlarged. In this way, the shelf device is also prevented from tipping over in pushing or pulling the shelf device. With respect to the prior art where the hook is used to prevent the shelf device from tipping over, the present invention can lead to a better tipping over prevention effect. The aesthetics of the shelf device is improved because it is unnecessary to provide the hook at the rear end of the shelf device. Furthermore, the second assembling portion is embodied as the groove extending through the surface of the second end, such that the second assembling portion slidably cooperates with the corresponding rib of the inner shell. In this case, the shelf device can be pushed and pulled conveniently, such that it is easy for the user to have access to foods.

[0026] Because the metal bar is connected with the shelf device via the connecting member, the rear end of the shelf device is prevented from contacting closely with the surface of the rear wall of the refrigeration chamber, which otherwise may cause that cold air circulating in the

refrigeration chamber is impeded by the shelf device such that foods placed at the rear end of the shelf device cannot be effectively stored in a chilled manner. At the same time, items placed on the shelf device are prevented from falling off in pushing or pulling the shelf device. In contrast of the conventional technical solution where the metal bar is fixed directly on the frame, according to the present invention, the metal bar can be detached and cleaned only by extracting the metal bar from the connection hole on the connection part of the connecting member. Moreover, in the case that the connecting member is used to secure the metal bar, the location via the connection hole is more convenient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027]

Figure 1 shows a schematic view of a holding plate according the prior art.

Figure 2 shows a partial perspective schematic view of a holding plate having a steel wire according to the prior art.

Figure 3 shows a structural schematic view of a refrigeration appliance.

Figure 4 shows an exploded and perspective view of a shelf device according to a particular embodiment of the present invention.

Figure 5 shows a partial and detailed schematic view of a first assembling portion of the object-holding according to a particular embodiment of the present invention.

Figure 6 shows a perspective schematic view of a positioning member according to a particular embodiment of the present invention.

Figure 7 is a perspective schematic view, showing a sectional plane where the positioning member according to the particular embodiment of the present invention is snapped with a rib of an inner shell.

Figure 8 shows a perspective schematic view of a shelf device according to a particular embodiment of the present invention.

Figure 9 shows a perspective schematic view of a shelf device according to another particular embodiment of the present invention.

Figure 10 shows a perspective schematic view of a connecting member of the shelf device according to said another particular embodiment of the present invention.

Figure 11 is a partial perspective schematic view, showing the connecting member of the shelf device according to said another particular embodiment of the present invention is embedded in a second assembling portion.

Figure 12 shows a perspective schematic view of a shelf device according to another particular embodiment of the present invention.

Figure 13 is a schematic view, showing that the shelf device according to said another particular embodiment of the present invention is assembled to the rib of the inner shell of the refrigerator.

DETAILED DESCRIPTION OF THE INVENTION

[0028] In the prior art, the frame of the holding plate is made of plastic by injection molding. The glass plate is bonded closely with the frame via bonding substance such as glue therebetween. Both sides of the front end of the holding plate are provided with a protruding structure so as to prevent the holding plate from shaking. The hook is provided at the rear end of the holding plate so as to prevent the holding plate from tipping over in drawing it. However, when the glass plate is bonded with the frame via glue, the glass plate can be easily released from the frame. If the protruding structure is adopted to prevent the holding plate from shaking, the holding plate cannot abut completely with the side wall of the inner shell. In this case, the holding plate will shake. Moreover, the hook cannot achieve a good effect of preventing from tipping over. The hook breaks easily and has not a pleasing appearance.

[0029] As for the holding plate in which the metal frame is adopted, the steel wire is fixed directly on the metal frame, which may result difficulty in detaching the steel wire. Meanwhile, it is also difficult to locate the steel wire on the metal frame.

[0030] In A shelf device according to the present invention, a positioning member cooperates with a frame and a rib of an inner shell so as to secure the shelf device, thereby preventing the shelf device from shaking and tipping over. A shelf panel is connected closely with the frame via a first assembling portion in the form of a groove whose bottom is W-shaped such that the shelf panel is prevented from loosening and the groove-shaped second assembling portion is provided directly at a second side of the frame. The groove-shaped second assembling portion cooperates with the rib of the inner shell such that the shelf device can be pushed or pulled and the shelf device is prevented from tipping over in pushing or pulling. A connecting member connects a metal bar with the shelf device such that any uneven circulation of cold air in the refrigerating chamber is prevented and items placed on the shelf panel are prevented from falling off in pushing or pulling the shelf panel. The assembling and disassembling of the metal bar is more convenient.

[0031] Figure 3 shows a structural schematic view of a refrigeration appliance. Here, said refrigeration appliance is explained as a desk refrigerator. However, it should be noted that the present invention is not limited to this. The present invention applies to any other appliance having a refrigerating function, such as a preservation cabinet.

[0032] As shown in figure 3, a refrigerator 3 comprises a body 30 and a door 31 which forms a storing space with the body 30 when the door 31 is closed. The body 30 comprises an outer shell 32 and an inner shell 33 maintained at an interval from the outer shell 32. The inner shell 33 comprises side walls 330 and a rear wall 331. A plurality of ribs 332 of the inner shell are provided on the side walls 330 of the inner shell 33 in an overlapping manner of one above another so as to support shelf devices 34 or drawers 35. Specifically, each rib 332 of the inner shell can be provided integrally on the side wall 330 of the inner shell of the refrigerator (as shown in figure 3) or can alternatively be comprised of a long rib and a short rib of the inner shell, wherein the long rib is located at the rear end of the side wall 330 of the refrigerator far away from the door 31, and the short rib is located at the front end of the side wall 330 of the refrigerator (not shown in figure 3, please refer to figure 13, the length and the position of the rib of the inner shell are determined by factors such as the dimension of the inner shell when designing the refrigerator and so on).

First Embodiment

[0033] A shelf device according the present embodiment is explained in detail in combination with figures 4 to 6.

[0034] Figure 4 is an exploded and perspective view of the shelf device according to the embodiment. As shown in figure 4, the shelf device 4 is fitted on the ribs of the side walls of the inner shell of the refrigeration appliance. The shelf device 4 comprises a shelf panel 40, a frame 41 and a positioning member 42 located at each of opposite sides of the shelf panel 40.

[0035] The frame 41 has a first side 410 and an opposite second side 412 as well as a first end 411 and an opposite second end 413. Surfaces of the first end 411 and the second end 413 connect with surfaces of the first side 410 and the second side 412. The surface of the second side 412 is opposed to the side wall of the inner shell and the surface of the second end 413 is opposed to the rear wall of the inner shell.

[0036] The first side 410 of the frame 41 has a first assembling portion 414 which is in cooperation with the shelf panel 40. The shelf panel 40 is fitted to the first assembling portion 414 of the frame 41 at one side.

[0037] In this embodiment, the material, of which the frame 41 is made, is aluminum alloy, because it is light and has an adequate strength and rigidity. In an alternative embodiment, the material of the frame 41 can be other material which is also light and has an adequate

strength and rigidity. The first assembling portion 414 can be embodied as a groove, such that one side of the shelf panel 40 can be inserted into it. In order to connect the shelf panel 40 closely with the frame 41, the first assembling portion 414 is preferably a first groove whose bottom is W-shaped (as shown in figure 5). The shelf panel 40, at one side, is fastened together with the first assembling portion 414 in the form of the groove whose bottom is W-shaped. Therefore, the frame 41 can be secured with the shelf panel 40 without any bonding substance such as glue. Therefore, the frame 41 is prevented from releasing from the shelf panel 40 which results from the glue ungluing in an environment of low temperature and high humidity.

[0038] The second side 412 of the frame 41 has a second assembling portion 416 which is in cooperation with the rib of the inner shell. The second assembling portion 416 of the frame 41 is fitted to the rib of the inner shell.

[0039] In this embodiment, the second assembling portion 416 is a second groove extending through the surface of the second end 413. By means of a sliding cooperation between the second groove and the rib of the inner shell, the shelf device 4 can be slid forwards and backwards along the side walls of the refrigerator, such that it is convenient for a user to have access to foods. Meanwhile, the second assembling portion 416 is embodied as a groove to enlarge the contact area between it and the rib of the inner shell. In this way, the shelf device 4 is prevented from tipping over in pushing or pulling the shelf device 4.

[0040] The first end 411 of the frame 41 is provided with a first inserting portion 415. The positioning member 42 comprises a snapping portion 421. The positioning member 42 is inserted into the first inserting portion 415, and the snapping portion 421 is snapped with the rib of the inner shell.

[0041] As shown in figures 4 and 6, in which figure 6 shows a perspective view of the positioning member 42 according to the embodiment, the positioning member 42 comprises the snapping portion 421 which is used to snap with the rib of the inner shell, such that the shelf device 4 is prevented from shaking and tipping over in the refrigerator. In order to ensure that the shelf device 4 can be snapped with the rib of the inner shell more closely, the positioning member 42 preferably comprises a first positioning portion 422 connecting with the snapping portion 421, as shown in figure 6. In figure 6, a surface of the first positioning portion 422 opposite the second side 412 of the frame 41 is provided with a first elastic portion 423. A first protruding post 424 is provided on the first elastic portion 423. As shown in figures 4 and 6, the first protruding post 424 is in cooperation with a first locating hole 418 which is, adjacent the surface of the first end 411, provided in the surface of the second side 412 of the frame 41. In an alternative embodiment, the first locating hole 418 may also be, adjacent the surface of the first end 411, provided on the surface of the first side 410 of the frame 41 (not shown). Correspondingly, in the

latter case, the first elastic portion and the first protruding post provided thereon are provided on the surface of the first positioning portion 422 opposite the first side 410 of the frame 40. By cooperating with the first elastic portion 423 and the first protruding post 424 provided on the first positioning portion 422, the positioning member 42 can be secured on the frame 41. Then, by in cooperation of the snapping portion 421, the positioning member 42 is abutted with the rib of the inner shell closely, as shown in figure 7. Figure 7 is a perspective schematic view, showing a sectional plane where the positioning member 42 is abutted with the rib of the inner shell closely. As shown in this figure, the positioning member 42 is inserted into the first inserting portion 415 and the snapping portion 421 is snapped with the rib of the inner shell, such that the shelf device 4 is abutted closely with the rib of the inner shell so as to prevent the shelf device 4 from shaking and tipping over. In this embodiment, the positioning member 42 is made of plastic. Therefore, it costs less and can be manufactured in a flexible manner. Furthermore, because the positioning member 42 is inserted in the first inserting portion 415 of the frame 41, the positioning member 42 is invisible. Therefore, the appearance of the entire shelf device 4 is more pleasing.

[0042] Figure 8 shows a perspective view of the shelf device 4 according to the embodiment. It is clear from figures 4, 6 and 8 that the shelf device 4 is assembled in the following steps. Firstly, two side edges of the shelf panel 40 are fixed on the frames 41 via the first assembling portions 414 of the frames 41. Then, the frames 41 fitted with the shelf panel 40 are fitted to the ribs of the inner shell of the refrigerator (not shown), such that the ribs of the inner shell are engaged into the groove-shaped second assembling portions 416.

[0043] Thereafter, the positioning members 42 are inserted into the first inserting portions 415. After the first protruding post 424 on the positioning members 42 is snapped with the first locating hole 418 provided on the surface of the second side 412 adjacent the surface of the first end 411, the positioning member 42 is secured on the frame 41. Meanwhile, the snapping portion 421 of the positioning member 42 is snapped closely with the rib of the inner shell. In this way, the entire shelf device 4 is fitted securely on the rib of the inner shell.

[0044] Furthermore, in this embodiment, the shelf device 4 is explained taking one side of the shelf panel 41 as an example. However, with respect to the other side of the shelf panel 41, the assembling of it with the frame 41 and the snapping of it with the rib of the inner shell are similar to the above, which will not be explained repeatedly.

Second Embodiment

[0045] Figure 9 shows an exploded and perspective view of an object-holding according to the second embodiment. As shown in figure 9, the shelf device 5 comprises a shelf panel 50, frames 51 at both sides of the

shelf panel 50, positioning members 52, a metal bar 52 and connecting members 54.

[0046] In order to prevent the rear end of the shelf device 5 from contacting closely with the rear wall surface of the refrigerating chamber such that cold air circulating in the refrigerating chamber is impeded by the shelf device 5 and thus foods placed at the rear end of the shelf panel 50 cannot be effectively stored in a chilled manner and in order to prevent items placed on the shelf device 5 from falling off in pushing or pulling the shelf device 5, in this embodiment, the metal bar 53 and the connecting members 54 are added based on the above first embodiment.

[0047] As shown in figure 9, the frame 51 has a first side 510 and a second side 512 opposite the first side as well as a first end 511 and an opposite second end 513. Surfaces of the first end 510 and the second end 513 connect with surfaces of the first side 510 and the second side 512. The surface of the second side 512 is opposed to the side wall of the inner shell. The surface of the second end 513 is opposed to the rear wall of the inner shell. The first side 510 of the frame 51 has a first assembling portion 514 which is in cooperation with the shelf panel 50. The shelf panel 50 is fitted to the first assembling portion 514 of the frame 51 at one side. A second side 512 of the frame 51 has a second assembling portion 516 which is in cooperation with the rib of the inner shell. The second assembling portion 516 of the frame 51 is fitted to the rib of the inner shell.

[0048] The configuration of the positioning member 52 and the assembling manners between the shelf panel 50 and the frame 51 as well as between the positioning member 52 and the frame 51 are similar to those according to the first embodiment, which will not be explained repeatedly. Said metal bar 53 and said connecting member 54 of the shelf device 5 according to the embodiment will be explained below.

[0049] As shown in figures 9 to 11, the connecting member 54 is inserted into the second assembling portion 516 from the surface of the second end 513. In this embodiment, the second assembling portion 516 is a groove extending through the surface of the second end 513. The connecting member 54 has a connection hole 543 (see figure 11) through which the metal bar 53 is inserted. In order to achieve a better securing between the connecting member 54 and the frame 51, preferably, as shown in figure 10, the connecting member 54 comprises a connection part 541 and a second locating part 542. The connection part 541 is connected with the second locating part 542 in an L-shape. The connection hole 543 is provided in the connection part 541 (see figure 11). The second locating part 542 has a second elastic portion 544 in a surface opposite the second side 512 of the frame 51. A second protruding post 545 is provided on the second elastic portion 544, and the second protruding post 545 is in cooperation with the second locating hole 520.

[0050] Still as shown in figure 9, in the present embodiment,

iment, said second locating hole 520, adjacent the surface of the second 513, is provided in the surface of the second side 512 of the frame 51. In an alternative embodiment, it is also possible that said second locating hole 520, adjacent the surface of the second end 513, is provided in the surface of the first side 510 of the frame 51 (not shown). Correspondingly, in the latter case, the second elastic portion and the second protruding post provided thereon are provided in a surface of the second 542 opposite the first side 510 of the frame 51. Referring to figures 10 and 11, by in cooperation of the second elastic portion 544 and the second protruding post 545 provided on the second locating part 542, the connecting member 54 can be fixed on the frame 51. The metal bar 53 can be secured together with the connecting member 54 by inserting the metal bar into the connection hole 543 of the connection part 541. When the metal bar 53 has to be cleaned, the metal bar 53 can be detached and cleaned only by extracting it out of the connection hole 543 provided on the connection part 541 of the connecting member 54. Moreover, by using the connection hole 543 provided on the connecting member 54 to secure the metal bar 53, the location via the connection hole 543 is more convenient.

[0051] From figures 9 to 11, it can be seen that as for the installation of the metal bar 53 and the connecting member 54, the connecting member 54 is firstly snapped with the frame 51 via the second protruding post 545 provided on the second locating part 542 of the connecting member 54, and then the metal bar 53 is inserted into the connection hole 543 provided on the connection part 541 of the connecting member 54.

[0052] The process of assembling the shelf device 5 according to the embodiment to the rib of the inner shell of the refrigerator will be explained in combination with figures 9 to 13 below.

[0053] Figure 12 shows a perspective view of the shelf device 5, which is assembled in the following manner. Firstly, the shelf panel 50 is secured to the first assembling portion 514 of the frame 51 at each of both side edges. Then, the connecting member 54 is inserted into the second assembling portion 516 from the second end 513 of the frame 51, and the second protruding post 545 on the second locating part 542 of the connecting member 54 is snapped with the second locating hole 520 of the frame 51. Thereafter, the metal bar 53 is inserted into the connection hole 543 in the connecting member 54. Subsequently, as shown in figure 13, the frame 51 fitted with the shelf panel 50, the connecting member 54 and the metal bar 53 is fitted on the side wall of the inner shell of the refrigerator, such that the rib 60 of the inner shell is inserted into the groove-shaped second assembling portion 516 as shown in figure 13. In this embodiment, any inner shell rib on the side wall of the refrigerator is a two-parted piece. In figure 13, the inner shell rib 60 adjacent the rear wall of the refrigerator slidably cooperates with the groove-shaped second assembling portion 516, such that the rib is inserted slowly into the groove. Then,

the positioning member 52 is inserted into a first inserting 515, such that the first protruding post on the positioning member 52 is snapped with a first locating hole 518 of the frame 51. In this way, the positioning member 52 is fixed on the frame 51. The shelf device 5 is pushed until the snapping portion of the positioning member 52 is snapped with the inner shell rib 61 far away from the rear wall of the refrigerator. Here, the entire shelf device 5 is fitted on the rib of the inner shell.

[0054] In summary, in the shelf device according to the embodiment of the present invention, the shelf device is fixed on the side wall of the inner shell by inserting the positioning member, such that the shelf device is prevented from shaking and tipping over.

[0055] Furthermore, the dimension of the positioning member can be customized with respect to inner shells having different drafting angles, such that a perfect abutment between the positioning member and the side wall of the inner shell can be achieved. Since the positioning member is inserted in the frame, a pleasing appearance can be obtained.

[0056] The first assembling portion on the frame is embodied as the groove whose bottom is W-shaped, such that the shelf panel can be connected closely with the frame to prevent the shelf panel from loosing.

[0057] The second assembling portion on the frame is groove-shaped, such that the shelf device is prevented from tipping over in pushing or pulling the shelf device.

[0058] Since the metal bar is connected to the shelf device by the connecting member, foods placed at the rear end of the shelf device can be effectively stored in a chilled manner. At the same time, items placed on the shelf device are also prevented from falling off in pushing or pulling the shelf device. In this way, the metal bar can be located, detached and cleaned more conveniently.

[0059] Although the present invention is explained by the above preferable embodiments, they are not used to limit the present invention. The protection scope of the present invention should be defined by claims of the present invention claimed to be protected.

Claims

1. A shelf device (4) which is suitable for being fitted onto ribs provided on side walls of an inner shell of a refrigeration appliance, wherein the shelf device (4) comprises a shelf panel (40), and further comprises a frame (41) at each of opposite sides of the shelf panel (40),
the frame has a first side (410) and an opposite second side (412) as well as a first end (411) and an opposite second end (413), surfaces of the first and second ends connect With surfaces of the first and second sides, the surface of the second side (412) is suitable to be opposed to the side wall of the inner shell, and the surface of the second end (413) is suitable to be opposed to a rear wall of the inner shell;

- the first side (410) of the frame (41) has a first assembling portion (414) which is in cooperation with the shelf panel (40), the shelf panel is fitted to the first assembling portion of the frame at one side; the second side (412) of the frame (41) has a second assembling portion (416) which is suitable for being in cooperation with the corresponding rib of the inner shell;
- the first end (411) of the frame (41) is provided with a first inserting portion (415),
- characterized in that** the shelf device (4) further comprises a positioning member (42) at each of opposite sides of the panel (40), and the positioning member (42) comprises a snapping portion (421), the positioning member (42) is inserted into the first inserting portion (415), and the snapping portion (421) is suitable for being snapped with the corresponding rib of the inner shell.
2. The shelf device (4) according to claim 1, **characterized in that** the surface of the first or second side of the frame is provided with a first locating hole adjacent the surface of the first end, the positioning member further comprises a first locating part connecting with the snapping portion, the first locating part has a first elastic portion thereon, a first protruding post is provided on the first elastic portion, and the first protruding post is in cooperation with the first locating hole.
 3. The shelf device (4) according to claim 1, **characterized in that** the positioning member (42) is made of plastic, and the frame is made of aluminum alloy.
 4. The shelf device (4) according to claim 1, **characterized in that** the first assembling portion (414) is embodied as a first groove whose bottom is W-shaped.
 5. The shelf device (5) according to claim 1, **characterized in that** the second assembling portion (516) is embodied as a second groove extending through the surface of the second end (513), and the frame (51) is suitable for being slidably fitted to the corresponding rib of the inner shell via the second groove.
 6. The shelf device (5) according to claim 5, **characterized in that** it further comprises a metal bar (53) and a connecting member (54), the connecting member is inserted into the second groove from the surface of the second end (513), and the connecting member (54) has a connection hole (543) through which the metal bar (53) is inserted.
 7. The shelf device (5) according to claim 6, **characterized in that** the connecting member (54) comprises a connection part (541) and a second locating part (542), the connection part and the second locating part are connected together in an L-shape, and the connection hole (543) is provided in the connection part (541).
 8. The shelf device (5) according to claim 7, **characterized in that** the surface of the first or second side of the frame (51) is provided with a second locating hole (520) adjacent the surface of the second end, the second locating part (542) has a second elastic portion (544) thereon, a second protruding post (545) is provided on the second elastic portion (544), and the second protruding post (545) is in cooperation with the second locating hole (520).
 9. The shelf device (5) according to claim 6, **characterized in that** the connecting member (54) is made of plastic.
 10. A refrigeration appliance (3) comprising a shelf device (415) according to any one of claims 1 to 9.

Patentansprüche

1. Regalvorrichtung (4), welche dazu geeignet ist, auf Rippen angebracht zu werden, die an Seitenwänden einer Innenschale eines Kühlgerätes vorgesehen sind, wobei die Regalvorrichtung (4) ein Regalpaneel (40) umfasst und ferner einen Rahmen (41) an jeder von einander gegenüberliegenden Seiten des Regalpaneels (40) umfasst, wobei der Rahmen eine erste Seite (410) und eine gegenüberliegende zweite Seite (412) sowie ein erstes Ende (411) und ein gegenüberliegendes zweites Ende (413) aufweist, Flächen des ersten und des zweiten Endes mit Flächen der ersten und der zweiten Seite verbunden sind, die Fläche der zweiten Seite (412) dazu geeignet ist, gegenüber der Seitenwand der Innenschale angeordnet zu werden, und die Fläche des zweiten Endes (413) dazu geeignet ist, gegenüber einer Rückwand der Innenschale angeordnet zu werden; wobei die erste Seite (410) des Rahmens (41) einen ersten Montageabschnitt (414) aufweist, welcher mit dem Regalpaneel (40) zusammenwirkt, wobei das Regalpaneel an einer Seite an dem ersten Montageabschnitt des Rahmens angebracht ist; wobei die zweite Seite (412) des Rahmens (41) einen zweiten Montageabschnitt (416) aufweist, welcher dazu geeignet ist, mit der entsprechenden Rippe der Innenschale zusammenzuwirken; wobei das erste Ende (411) des Rahmens (41) mit einem ersten Einsteckabschnitt (415) versehen ist, **dadurch gekennzeichnet, dass** die Regalvorrichtung (4) ferner ein Positionierelement (42) an jeder von gegenüberliegenden Seiten des Paneels (40) umfasst, und das Positionierelement (42) einen Schnappabschnitt (421) umfasst, das Positioniere-

lement (42) in den ersten Einsteckabschnitt (415) eingesteckt wird und der Schnappabschnitt (421) dazu geeignet ist, mit der entsprechenden Rippe der Innenschale zusammengeschnappt zu werden.

2. Regalvorrichtung (4) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Fläche der ersten oder zweiten Seite des Rahmens mit einer ersten Ausrichtbohrung versehen ist, die der Fläche des ersten Endes benachbart ist, wobei das Positionierelement ferner einen ersten Positionierteil umfasst, der mit dem Schnappabschnitt verbunden ist, der erste Positionierteil einen daran angebrachten ersten elastischen Abschnitt aufweist, eine erste vorstehende Säule an dem ersten elastischen Abschnitt vorgesehen ist und die erste vorstehende Säule mit der ersten Ausrichtbohrung zusammenwirkt.
3. Regalvorrichtung (4) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Positionierelement (42) aus Kunststoff hergestellt ist und der Rahmen aus Aluminiumlegierung hergestellt ist.
4. Regalvorrichtung (4) nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Montageabschnitt (414) als eine erste Nut ausgebildet ist, deren Boden W-förmig ist.
5. Regalvorrichtung (5) nach Anspruch 1, **dadurch gekennzeichnet, dass** der zweite Montageabschnitt (516) als eine zweite Nut ausgebildet ist, die sich durch die Fläche des zweiten Endes (513) hindurch erstreckt, und der Rahmen (51) dazu geeignet ist, über die zweite Nut gleitend an der entsprechenden Rippe der Innenschale angebracht zu werden.
6. Regalvorrichtung (5) nach Anspruch 5, **dadurch gekennzeichnet, dass** sie ferner einen Metallstab (53) und ein Verbindungselement (54) umfasst, das Verbindungselement von der Fläche des zweiten Endes (513) aus in die zweite Nut eingesteckt wird und das Verbindungselement (54) eine Verbindungsbohrung (543) aufweist, durch welche hindurch der Metallstab (53) eingesteckt wird.
7. Regalvorrichtung (5) nach Anspruch 6, **dadurch gekennzeichnet, dass** das Verbindungselement (54) einen Verbindungsteil (541) und einen zweiten Positionierteil (542) umfasst, wobei der Verbindungsteil und der zweite Positionierteil in einer L-Form miteinander verbunden sind und die Verbindungsbohrung (543) in dem Verbindungsteil (541) vorgesehen ist.
8. Regalvorrichtung (5) nach Anspruch 7, **dadurch gekennzeichnet, dass** die Fläche der ersten oder zweiten Seite des Rahmens (51) mit einer zweiten Ausrichtbohrung (520) versehen ist, die der Fläche des zweiten Endes benachbart ist, der zweite Posi-

tionierteil (542) einen daran angebrachten zweiten elastischen Abschnitt (544) aufweist, eine zweite vorstehende Säule (545) an dem zweiten elastischen Abschnitt (544) vorgesehen ist und die zweite vorstehende Säule (545) mit der zweiten Ausrichtbohrung (520) zusammenwirkt.

9. Regalvorrichtung (5) nach Anspruch 6, **dadurch gekennzeichnet, dass** das Verbindungselement (54) aus Kunststoff hergestellt ist.
10. Kühlgerät (3), welches eine Regalvorrichtung (4/5) nach einem der Ansprüche 1 bis 9 umfasst.

Revendications

1. Dispositif à étagères (4) qui est approprié pour être placé sur des nervures ménagées sur des parois latérales d'une enveloppe interne d'un appareil de réfrigération, dans lequel le dispositif à étagères (4) comprend un plateau d'étagère (40), et comprend en outre un châssis (41) au niveau de chacun des côtés opposés du plateau d'étagère (40), le châssis a un premier côté (410) et un deuxième côté opposé (412) ainsi qu'une première extrémité (411) et une deuxième extrémité opposée (413), les surfaces des première et deuxième extrémités se raccordent aux surfaces des premier et deuxième côtés, la surface du deuxième côté (412) est appropriée pour être opposée de la paroi latérale de l'enveloppe interne, et la surface de la deuxième extrémité (413) est appropriée pour être opposée d'une paroi arrière de l'enveloppe interne ; le premier côté (410) du châssis (41) a une première partie d'assemblage (414) qui est en coopération avec le plateau d'étagère (40), le plateau d'étagère est inséré dans la première partie d'assemblage du châssis au niveau d'un côté ; le deuxième côté (412) du châssis (41) a une deuxième partie d'assemblage (416) qui est appropriée pour être en coopération avec la nervure correspondante de l'enveloppe interne ; la première extrémité (411) du châssis (41) est dotée d'une première partie d'introduction (415), **caractérisé en ce que** le dispositif à étagères (4) comprend en outre un élément de positionnement (42) au niveau de chacun des côtés opposés du plateau (40), et l'élément de positionnement (42) comprend une partie à encliqueter (421), l'élément de positionnement (42) est introduit dans la première partie d'introduction (415), et la partie à encliqueter (421) est appropriée pour être encliquetée avec la nervure correspondante de l'enveloppe interne.
2. Dispositif à étagères (4) selon la revendication 1, **caractérisé en ce que** la surface du premier ou du deuxième côté du châssis est dotée d'un premier

orifice de fixation adjacent à la surface de la première extrémité, l'élément de positionnement comprend en outre une première partie de fixation se raccordant à la partie à encliqueter, la première partie de fixation comporte une première partie élastique, un premier ergot en saillie est ménagé sur la première partie élastique, et le premier ergot en saillie est en coopération avec le premier orifice de fixation.

3. Dispositif à étagères (4) selon la revendication 1, 10
caractérisé en ce que l'élément de positionnement (42) est réalisé en plastique, et le châssis est réalisé en alliage d'aluminium.
4. Dispositif à étagères (4) selon la revendication 1, 15
caractérisé en ce que la première partie d'assemblage (414) est représentée en tant qu'une première rainure dont la base a la forme d'un W.
5. Dispositif à étagères (5) selon la revendication 1, 20
caractérisé en ce que la deuxième partie d'assemblage (516) est représentée en tant qu'une deuxième rainure s'étendant à travers la surface de la deuxième extrémité (513), et le châssis (51) est approprié pour être placé par glissement sur la nervure correspondante de l'enveloppe interne via la deuxième rainure. 25
6. Dispositif à étagères (5) selon la revendication 5, 30
caractérisé en ce qu'il comprend en outre une barre métallique (53) et un élément de raccordement (54), l'élément de raccordement est introduit dans la deuxième rainure à partir de la surface de la deuxième extrémité (513), et l'élément de raccordement (54) a un orifice de raccordement (543) à travers lequel la barre métallique (53) est introduite. 35
7. Dispositif à étagères (5) selon la revendication 6, 40
caractérisé en ce que l'élément de raccordement (54) comprend une partie de raccordement (541) et une deuxième partie de fixation (542), la partie de raccordement et la deuxième partie de fixation sont raccordées ensemble selon une forme de L, et l'orifice de raccordement (543) est ménagé dans la partie de raccordement (541). 45
8. Dispositif à étagères (5) selon la revendication 7, 50
caractérisé en ce que la surface du premier ou du deuxième côté du châssis (51) est dotée d'un deuxième orifice de fixation (520) adjacent à la surface de la deuxième extrémité, la deuxième partie de fixation (542) comporte une deuxième partie élastique (544), un deuxième ergot en saillie (545) est ménagé sur la deuxième partie élastique (544), et le deuxième ergot en saillie (545) est en coopération avec le deuxième orifice de fixation (520). 55
9. Dispositif à étagères (5) selon la revendication 6,

caractérisé en ce que l'élément de raccordement (54) est réalisé en plastique.

10. Appareil de réfrigération (3) comprenant un dispositif à étagères (415) selon l'une quelconque des revendications 1 à 9.

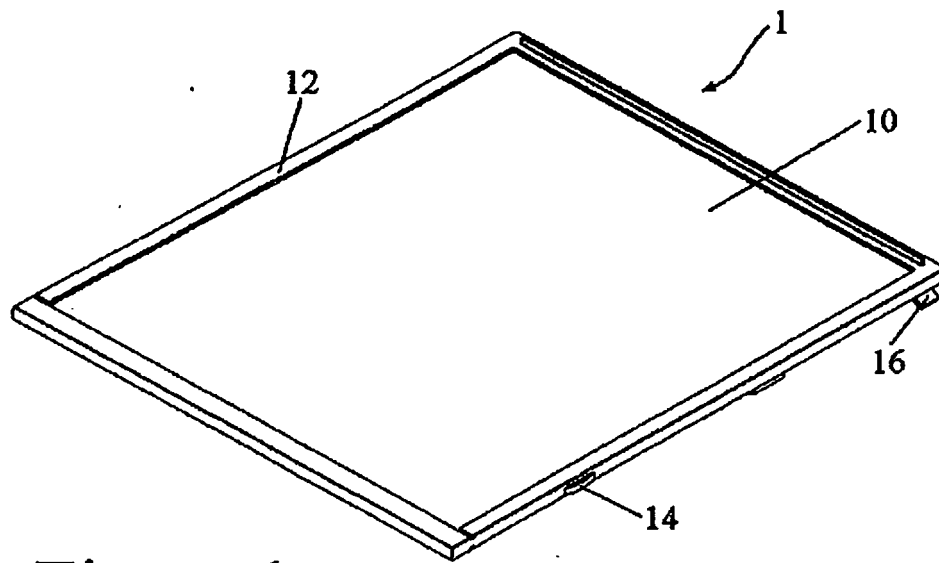


Figure 1

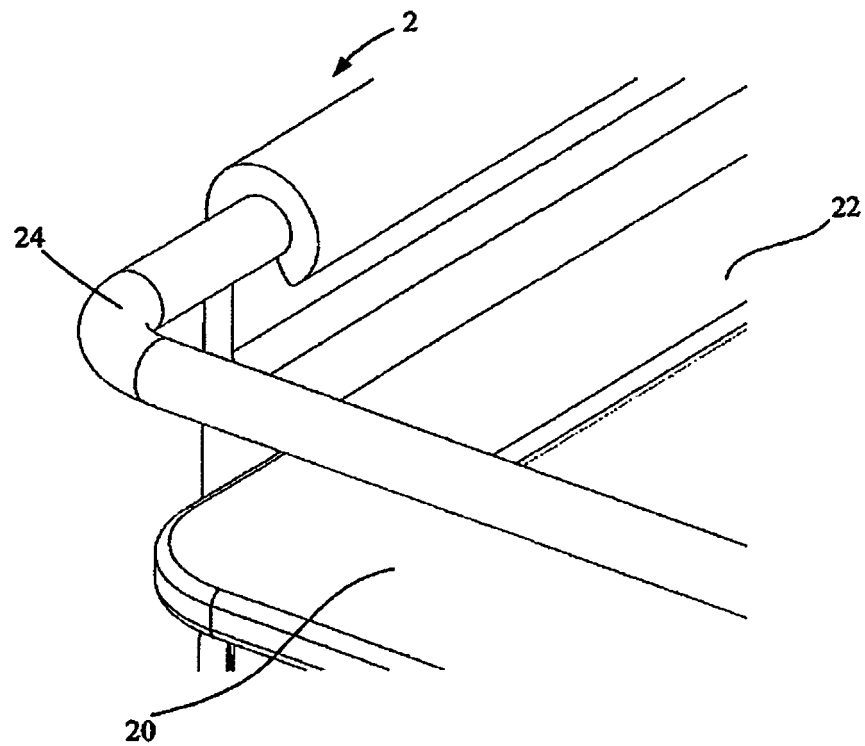


Figure 2

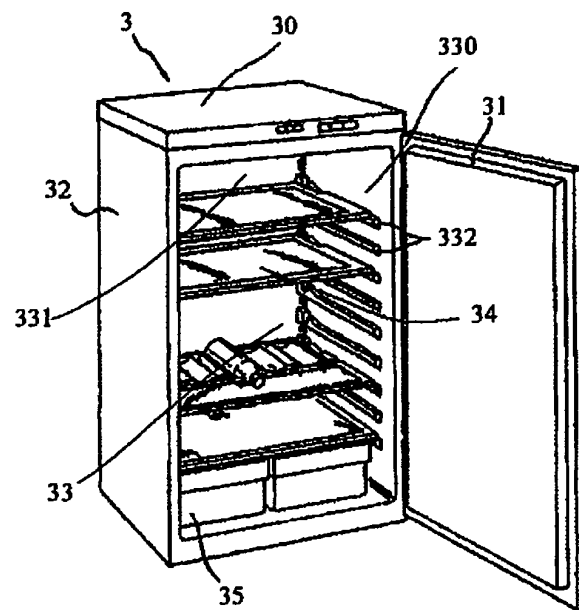


Figure 3

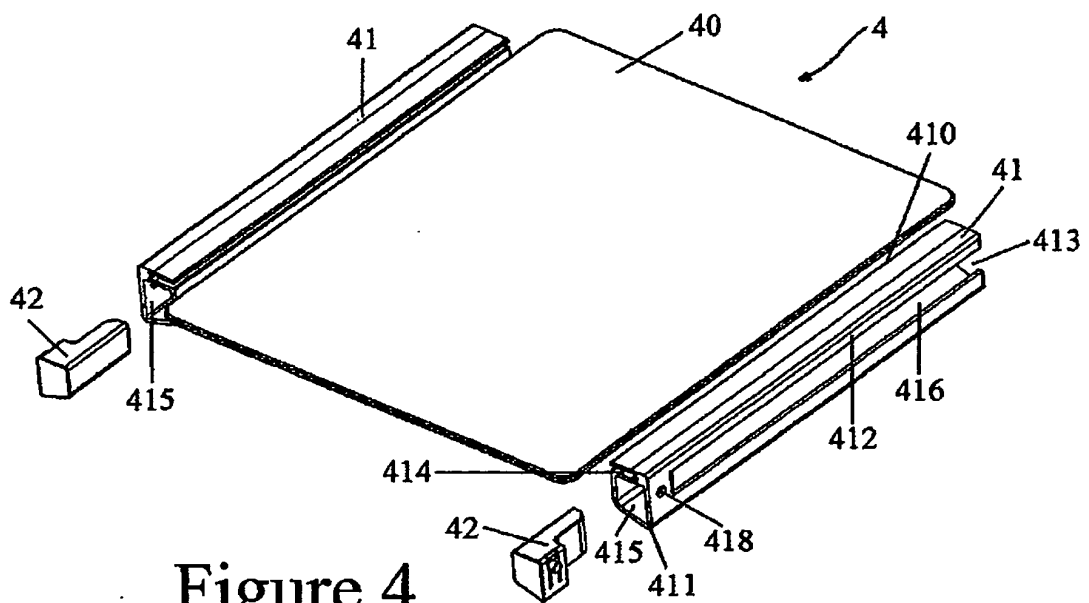


Figure 4

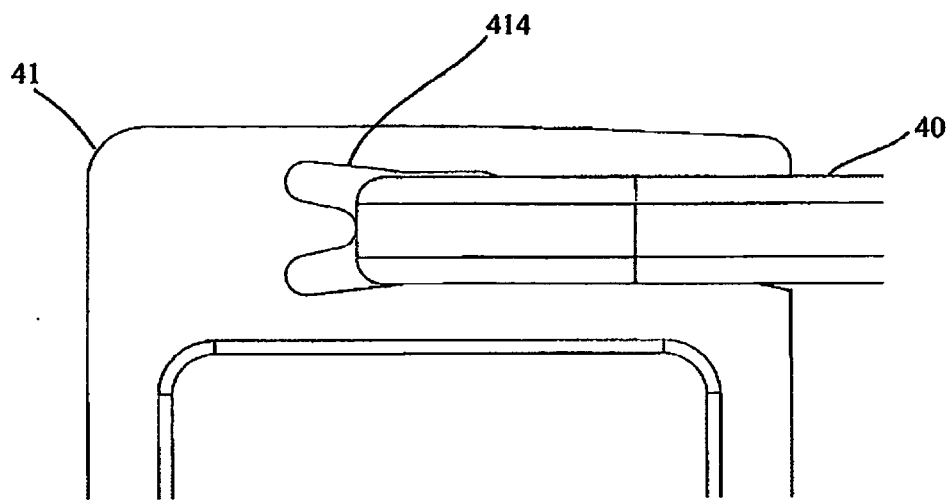


Figure 5

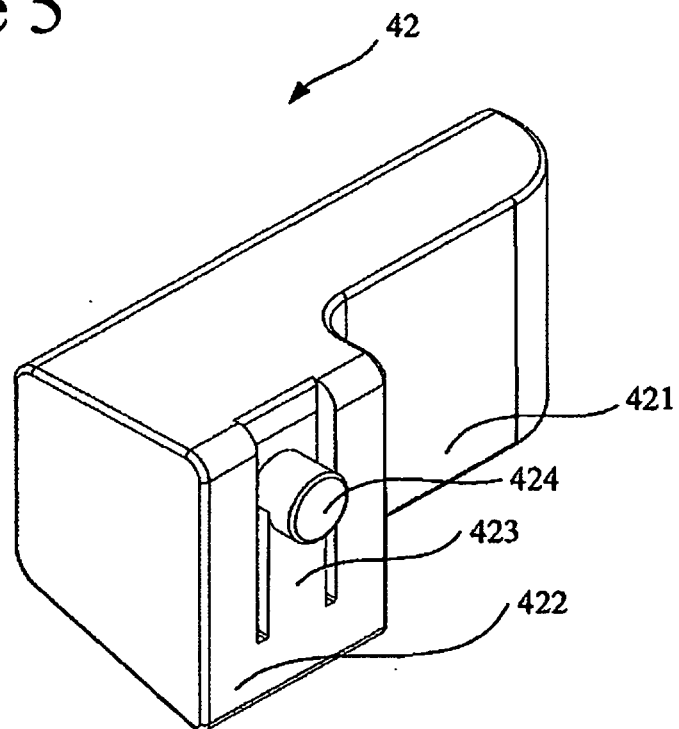


Figure 6

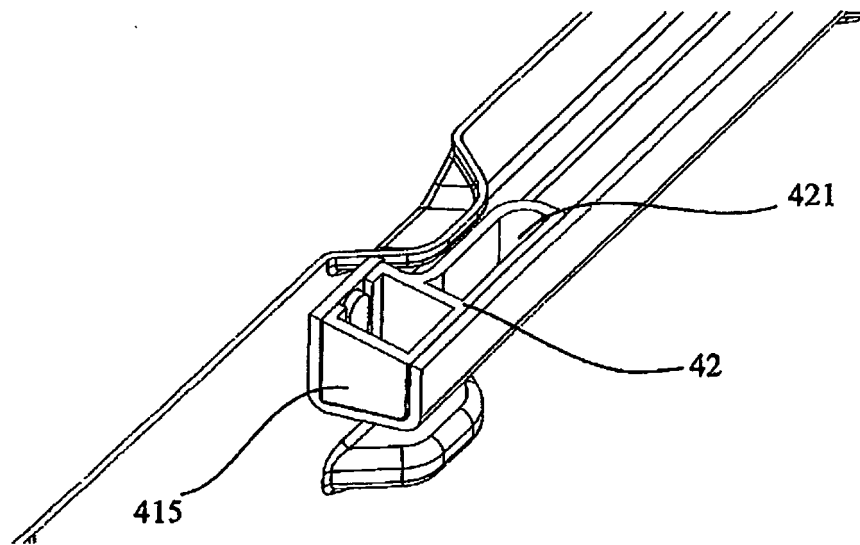


Figure 7

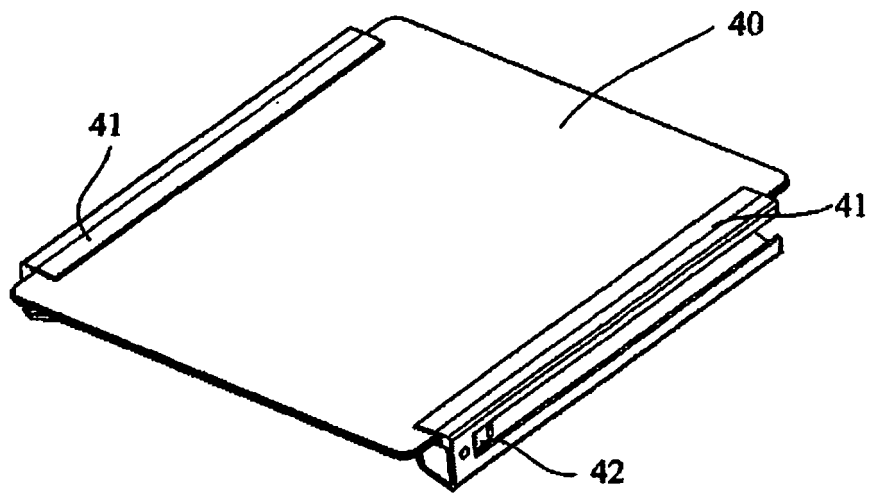


Figure 8

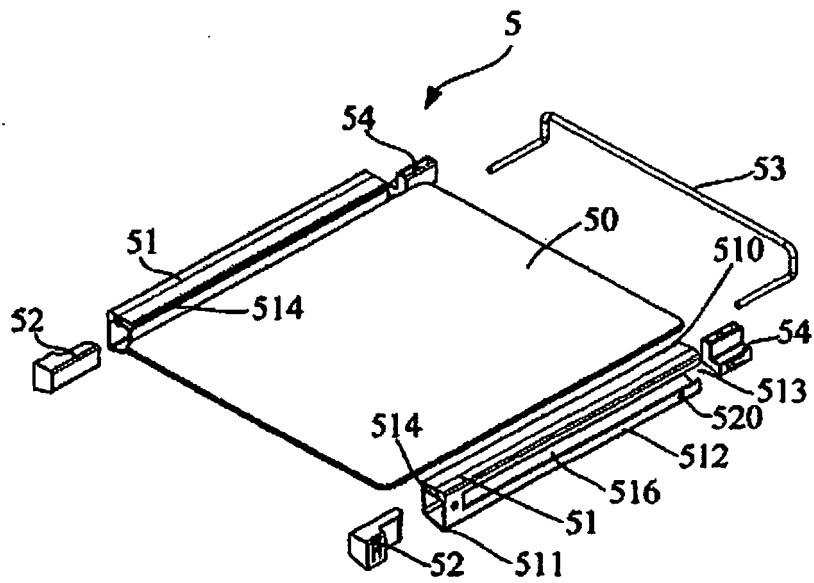


Figure 9

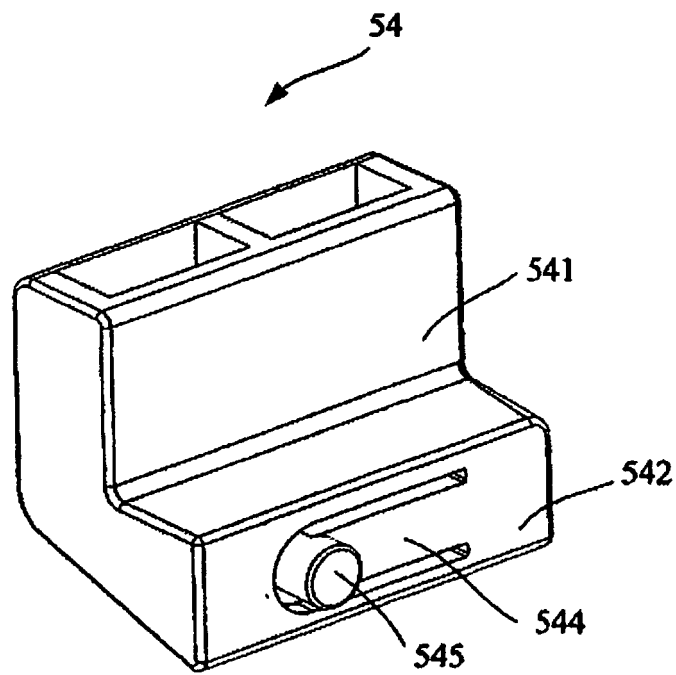


Figure 10

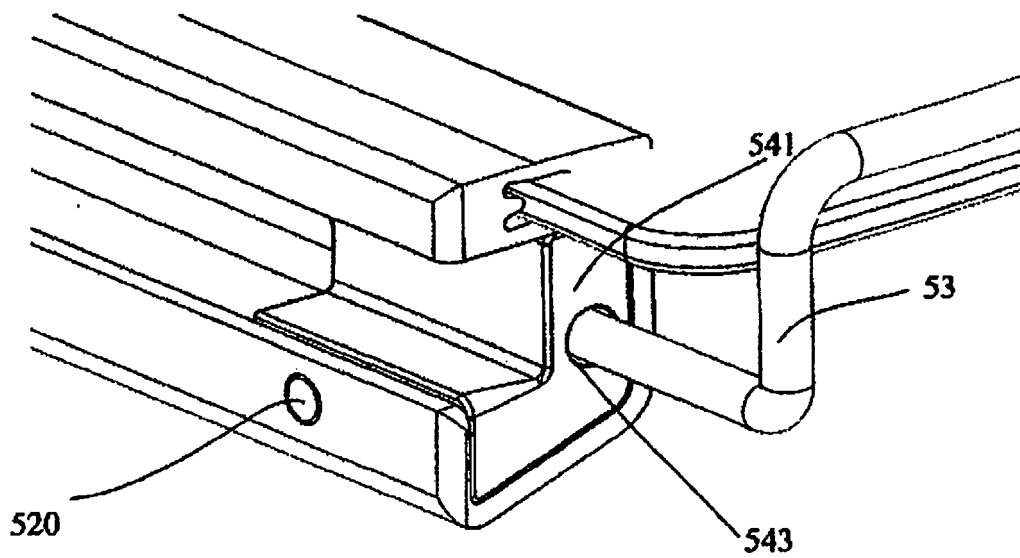


Figure 11

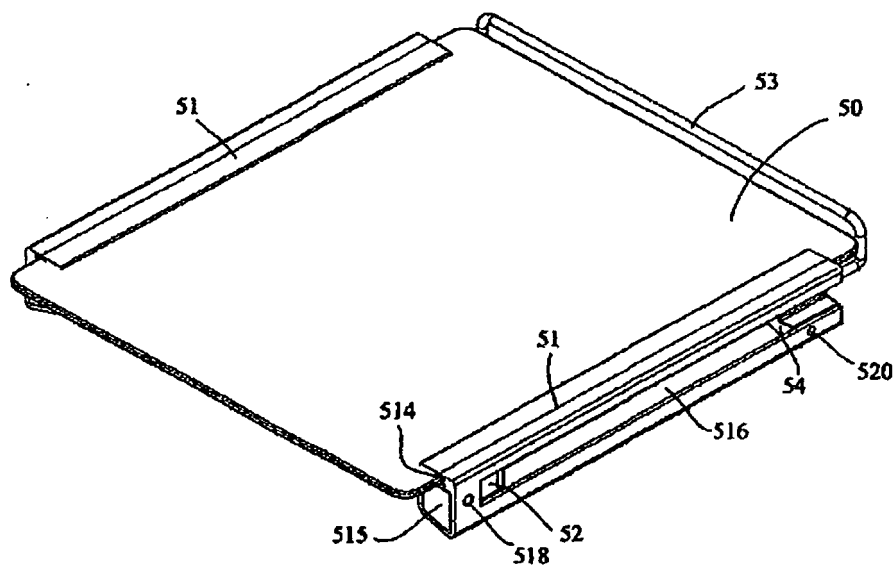


Figure 12

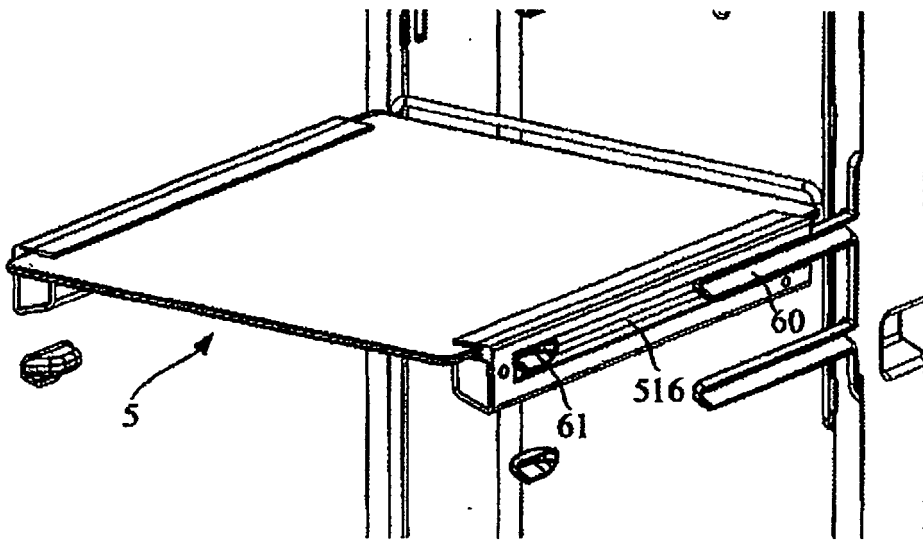


Figure 13

REFERENCES CITED IN THE DESCRIPTION

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