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(54) **Refrigerating appliance**

(57) A refrigerating appliance comprising a cabinet (2) with a preservation compartment (3) provided with at least one intermediate shelf (10) removably supported by way of support means (6-7) provided at opposed side walls (3a) of the compartment (3). The shelf (10) comprises at least one stationary shelf section (21) and one movable shelf section (31) articulated to each other such that the movable shelf section (31) can be made to rotate relative to the stationary shelf section (21) between at least two positions of use, at a first position of use a first end of the movable shelf section (31) being close to a

first end of the stationary shelf section (21), with the two shelf sections (21, 31) that form a substantially continuous support rest surface for supporting items to be preserved. The stationary shelf section (21) is provided, at opposed side regions thereof, with respective side members (22) each having a fixed hinge part (23). Each side member (22) has a respective part (22b) that projects longitudinally beyond the first end of the stationary shelf section (21), substantially in a cantilever fashion, and that includes at least one support (24) for supporting the movable shelf section (31) when the movable shelf section is at the first position of use.

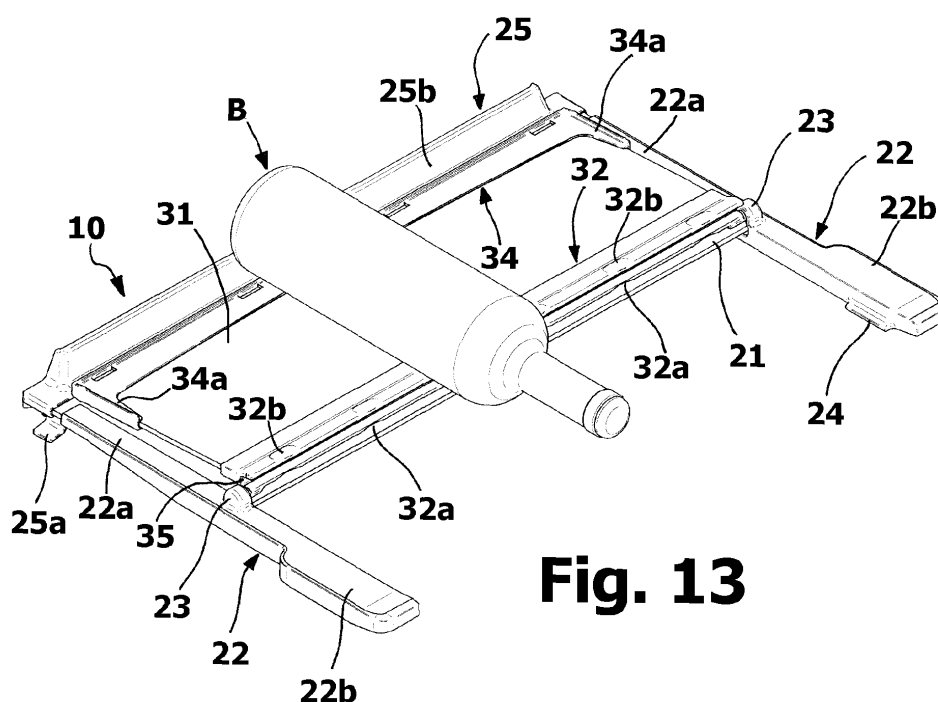


Fig. 13

Description

Field of the invention

[0001] The present invention refers to refrigerating appliances, such as refrigerators, freezers and fridge-freezers. The invention was developed with particular reference to a household refrigerating appliance having at least one compartment whose preservation space is divided into one or more shelves, each supported laterally through support means provided for at the opposed side walls of the compartment itself.

Description of the prior art

[0002] Known are household refrigerating appliances provided with at least one shelf including two distinct shelf sections, which in a normal position of use are supported within the compartment in such a manner to define a substantially continuous surface or rest plane. A shelf section is movable with respect to the other, so as not to hinder the positioning, for example on a shelf located beneath the considered one, of bottles or similar relatively high articles (i.e., with reference to the considered example, articles that are higher than the distance existing between the lower and upper shelf).

[0003] In some solutions, the two shelf sections are hinged to each other, in such a manner that the movable shelf section, usually the front one, may be rotated around a substantially horizontal axis, until it possibly lies on the stationary shelf section. A solution of this type is for example known from WO 2006/018757, on which the preamble of claim 1 is based.

[0004] The stability of the shelves obtained according to the teachings of the cited prior art document is low and the relative rest position between the articulated sections, when these are to be positioned to define a substantially continuous support rest surface, may be inaccurate, even with some sort of warping at the central zone of the shelf, with a poor aesthetic and functional effect. The rotation movement of a section with respect to the other may be occasionally inaccurate or complicated, even due to the possible movements of the rotation axis of the movable shelf section during movement thereof.

[0005] According to other solutions both shelf sections are rotatable relative to each other. KR 2004 0070986 discloses a solution of this kind. In this type of solution the shelf must be equipped with a supporting peripheral frame, which surrounds both shelf sections and to which the same sections must be hinged. The above said peripheral frame must thus be provided with fixed hinge parts, whereas each shelf section must be provided with respective movable hinge parts. Such solution complicates manufacturing of the shelf and makes it more expensive.

[0006] Shelves are also known configured such that a movable shelf section can be made to slide till under a stationary shelf section. DE 90 06 675 U discloses a so-

lution of this kind. In this case the stationary shelf section has side elements which protrudes frontally, substantially in a cantilever fashion, and which includes at the front end thereof first support means for supporting the front part of the movable shelf section, when the movable shelf section is substantially co-planar with the stationary shelf section. Also this type of solution makes the manufacturing of the shelf more complicated and expensive, in view of the need of providing sliding guides extending for the whole length of the above said side elements, and for the need of providing second support means, to support the movable shelf at the rear part thereof. Use of the shelf is also relatively uncomfortable, in that it imposes the movable shelf portion to be slightly pulled forward, to cause disengagement thereof from the first and second support means, then to fit the rear end of the movable shelf portion into the sliding guide and finally to push backwards the movable into the guides, until under the stationary shelf section. During sliding it may also happen occasionally that the movable section jams along the guides. Additionally, the fact that the two shelf sections are not mechanically connected to each other, as is instead the case of sections hinged to each other, involves problems of the shelf during normal use thereof. It may happen, for instance, that manual displacement of items of the shelf causes an unintentional forward sliding of the movable section, which thus disengages from the corresponding supports and assumes a tilted position.

Object and summary of the invention

[0007] The present invention essentially aims at providing a refrigerating appliance provided with at least one shelf having at least two sections hinged together, and at least one such shelf, capable of overcoming at least one of the abovementioned drawbacks.

[0008] Within this frame, an aim of the invention is that of providing such shelf which, though made simple and inexpensive, is capable of ensuring stability in use.

[0009] Another aim of the invention is that of providing such shelf in which rest accuracy between the stationary and movable sections is improved, when such sections are arranged to form a substantially continuous support rest surface.

[0010] Another aim of the invention is that of providing such shelf operating reliably, particularly regarding accuracy and easiness of the rotational movement of the movable shelf section thereof.

[0011] Another aim of the invention is that of providing such shelf having improved utility and functionality with respect to prior art solutions.

[0012] Another aim of the invention is that of indicating a method particularly advantageous for obtaining a shelf of the indicated type.

[0013] These and other aims are attained, according to the invention, by a refrigerating appliance, a refrigerating appliance shelf and a method for obtaining a refrigerating appliance shelf having the characteristics of the

attached claims.

[0014] In summary, according to the invention, a refrigerating appliance shelf is provided for to be supported in a removable manner inside a preservation compartment, through support means provided for at opposed side walls of the compartment. The shelf comprises at least one stationary shelf section and one movable shelf section articulated to each other in such a manner that the movable shelf section is rotatable with respect to the stationary shelf section between at least two positions of use, at a first position of use a first end of the movable shelf section being close to a first end of the stationary shelf section, with the two shelf sections forming a substantially continuous support rest surface for supporting items to be preserved, and wherein the stationary shelf section is provided, at opposed side regions thereof, with respective side members, which are fixed relative to the stationary shelf section, each side member having a fixed hinge part.

[0015] Each side member has a respective part projecting lengthwise beyond the first end of the stationary shelf section, substantially cantilevered, and which includes at least one support for supporting the movable shelf section when the latter is at the first position of use. In this manner, the movable shelf section is supported, when it is at the abovementioned first position of use, through parts associated to the stationary shelf section, hence ensuring an improved stability of the shelf in its entirety and an improved respective positioning and rest accuracy between the two shelf sections.

[0016] In one embodiment of the invention the first end of the movable shelf section is provided with a longitudinally extended transverse member having a throat or transverse seat wherein, when the movable shelf section is at the abovementioned first position of use, at least part of the first end of the stationary shelf section is received. This embodiment allows good coupling between the shelf sections in the respective opposed ends, and this allows improving the respective positioning and rest accuracy between the two sections, also allowing reducing the risk of warping in the central zone of the shelf.

[0017] In a second embodiment of the invention the first end of the movable shelf section is provided with a longitudinally extended transverse member, having a pair of movable hinge parts, each of which is obtained at a respective longitudinal end of the transverse member and operatively coupled to a fixed hinge part of a respective side member of the stationary shelf section. This embodiment ensures high accuracy of the rotation movement of the movable section with respect to the stationary section, in that the rotation axis is obtained through a single piece, which is substantially extended over the entire length of the movable shelf section and which is coupled to hinge parts located at opposed sides of the fixed shelf section. Preferably, the fixed hinge parts and the movable hinge parts are in such a position that the rotation axis, substantially horizontal, is extended higher with respect to the rest surface of the stationary shelf section

and the movable shelf section when at the first position of use, and this contributes to facilitate the movement imparted by a user to the movable shelf section.

[0018] In a third embodiment of the invention the first end of the movable shelf section is provided with a longitudinally extended transverse member having at least one rest portion provided with notches or seats for positioning items to be preserved on the shelf. In this manner, the presence of the transverse member which is extended in an intermediate zone of the common surface of the shelf, when the latter is in the abovementioned first position of use, is useful to maintain in position items to be supported at a reclined position, such as for example bottles, hence increasing the functionality and utility of the shelf. Still with reference to this fourth embodiment of the invention, at a second position of use of the shelf, the movable shelf section is substantially folded over the stationary shelf section: for such case, advantageously, the abovementioned transverse member has a first and a second rest portion substantially opposed to each other, each provided with the abovementioned notches or seats, the first rest surface being useable when the movable shelf section is at the abovementioned first position of use and the second rest surface being useable even when the movable shelf section is at the second position of use.

Brief description of the drawings

[0019] Further objects, characteristics and advantages shall be clear from the following description, provided for exemplifying and non-limiting services, with reference to the attached drawings, wherein:

- figures 1 - 3 are perspective, partial, schematic views and in various scales, of a refrigerating appliance according to the invention;
- figure 4 is a plan view of a shelf according to the invention, in enlarged scale with respect to figures 1-3;
- figures 5 - 7 are sectional views of the shelf of figure 4, in different scale, according to lines V-V, VI-VI and VII-VII respectively;
- figures 8 and 9 are perspective views, from different angles, of a side member of the shelf of figure 4;
- figure 10 is a side view of the element of figures 8 and 9;
- figures 11 - 13 are perspective views of the shelf of figure 4 in three different conditions;
- figures 14 - 16 are perspective views illustrating an assembly sequence of the shelf of figure 4; and
- figures 17 and 18 are enlarged scale details of figures 15 and 16, respectively.

Detailed description of exemplary embodiments of the invention

[0020] With particular reference to figures 1-3, a

household refrigerator according to the invention is indicated in its entirety with 1; however the invention is also applicable to freezers and fridge-freezers provided with removable shelves.

[0021] The refrigerator 1 has a fixed or movable structure 2, having at least one compartment 3 for preserving food items and the like, for example a compartment for fresh foods. The compartment 3 has opposed side walls 3a, a rear wall 3b and upper and lower walls, not indicated, as well as an access front opening, provided at which is a door. The door, not represented, is articulated to the cabinet 2 by means of hinges, one of which is partially observable, indicated with 4. The cabinet 2 is provided with a control panel 5.

[0022] Provided for in the compartment 3, at an intermediate position of the preservation space, is at least one shelf, adapted to support food items and the like. Only one shelf is illustrated in the figures, but the appliance may provide for more than one shelf, at least one of which being of the type described herein. The shelf, indicated in its entirety with 10, is removably supported through support means provided for at the side walls 3a. Preferably, these support means have small dimensions and comprise, for each wall, at least two support members spaced from each other in a depth direction of the compartment 3. In the illustrated non-limiting example, these means include at least one projection 6 and at least one recess 7 in the same wall 3a, substantially at the same height. In the illustrated example, the projections 6 are located at a rear zone of the respective wall 3a, i.e. a zone closer to the wall 3b than to the front opening of the compartment 3; the recesses 7 are instead located at a front zone of the respective wall 3a, i.e. a zone closer to the front opening of the compartment 3 than to the wall 3b thereof.

[0023] The shelf 10 comprises at least two sections, and precisely a stationary shelf section and a movable shelf section, articulated to each other such that the first is rotatable with respect to the second, between at least two different positions of use, one of which observable for example in figures 1-4. In the illustrated non-limiting example, the two shelf sections are mainly formed by two plate-shaped bodies indicated with 21 and 31, for example made of glass or transparent material. It should be observed that a shelf section is defined "stationary" with reference to the normal use of the shelf 10 as described herein, i.e. when the same is mounted inside the compartment 3: as mentioned, the shelf 10 is in fact removable when required from the refrigerator 1, for example to allow cleaning thereof.

[0024] The stationary shelf section has, at opposed side regions thereof, respective members each provided with a fixed hinge part. These side members, indicated with 22 and hereinafter referred to as sides, are substantially configured as profiles or frame members applied to the plate 21, and thus in a fixed position relative to the plate itself. As observable particularly in figures 4-10, the sides 22 have a portion 22a which is coupled to a respec-

tive edge of the plate 21, particularly covering it over a prevailing part. The sides 22 have, at an intermediate zone thereof substantially in line with respect to the front edge of the plate 21, a respective fixed hinge part 23. In the illustrated example the hinge parts 23 each comprise an upwards projecting portion of the respective member 22, provided with a cavity or seat indicated with 23a in figures 8-10, with a substantially 8-shaped mouth profile; identified in the seat 23a are an upper portion defined in the fixed hinge part 23 and a lower portion defined in the body of the side 22, below the hinge part 23, where the mouth of the lower portion of the seat has a characteristic dimension or diameter larger with respect to the mouth of the upper portion.

[0025] As observable again in figures 8-10, portion 22a of the sides 22 is provided with a groove or longitudinal throat 22c; facing each other inside this throat are teeth or engagement reliefs, some indicated with 22d in figure 8 and 10, formed at the upper part of the throat 22c and intended to cooperate with a groove formed along two opposed sides of the plate 21.

[0026] The rear end of the portion 22a of the side 22 has, at the lower part of the throat 22c, a part 22e projecting from which - in the longitudinal direction of the side - are two substantially parallel projections, having a different length and each provided with a respective coupling 22g, 22f, particularly tooth-shaped; the two projections with the respective coupling may be alternatively used for coupling with a further member of the stationary shelf section, as described hereinafter.

[0027] In a preferred embodiment the rear end part of the movable shelf section is provided with a longitudinally extended transverse member, indicated with 32, hereinafter identified as a rear crosspiece. In the example, also the rear crosspiece 32 is essentially configured as a frame member applied to the plate 31, with a throat which receives the rear edge of the latter, as observable for example in figure 6. Still with reference to the illustrated non-limited example, the rear crosspiece 32 is extended over the entire length of the plate 31 and it has, at each longitudinal edge, a movable hinge part 33, which is operatively coupled to the fixed hinge part 23 of a respective side 22. In the illustrated example, these movable hinge parts 33 comprise widened end portions shaped as a cylindrical pin, indicated with 33a only in figures 14 and 17, each of which is coupled free to rotate in the upper portion of the seat 23a of the respective fixed hinge part 23, as observable for example in figure 7. The configuration of the articulation means provided for between the shelf sections may obviously be different from the illustrated one, for example with the abovementioned pin portions obtained in the fixed hinge parts of the sides 22 and the abovementioned seats obtained in the movable hinge parts of the rear crosspiece 32. The rotation axis of the movable section is fixed, substantially horizontal and, in the illustrated example, the fixed and movable hinge parts are in such a position that the movable shelf section is rotatable according to an axis that is extended higher

with respect to the rest surface of the stationary shelf section, as defined by the respective plate 21, and also higher with respect to the rest surface of the plate 31, when the latter is in the position of use of figures 1-4 and 11.

[0028] Each side 22 has a respective portion projecting lengthwise beyond the front end of the stationary shelf section i.e. - still with reference to the illustrated embodiment - beyond the front edge of the plate 21, and beyond the zone where the articulation means represented by the hinges 23, 33 are found. These projecting portions, indicated with 22b, are thus extended substantially cantilevered with respect to the plate 21, substantially parallel to each other, so that each form a respective side support for the movable shelf section 30, when the latter is at the position of use illustrated in figures 1-4 and 11.

[0029] In the illustrated embodiment, when the movable shelf section is at the position of figures 1-4 and 11, its side edges face the inner sides of the projecting portions 22b of the sides 22, slightly spaced therefrom. For such purpose, the plate 31 is less wide with respect to the plate 21, and the projecting portions 22b thus provide a sort of side protection with respect to the edges of the plate 31, when the movable section is at the considered position (indicatively, the width difference between the two plates 21 and 31 may amount to about 40 mm). Still with reference to the illustrated example, substantially projecting orthogonally from the inner sides of the projecting portions 22b, i.e. the sides facing each other, are elements or projections for supporting the movable shelf section when the latter is at the position of figures 1-4 and 11: one of these projections, indicated with 24, is observable for example in figures 2, 6, and 8-10, while both the projections 24 are partially observable in figure 4.

[0030] As shown, at the position of figures 1-4 and 11, the plates 21 and 31 of the two sections are substantially co-planar and form a rest surface which is substantially or prevalently continuous, with the rear end part of the movable shelf section being close to the front end part of the stationary shelf section (see also figure 6). Such rest surface or plane is briefly interrupted at an intermediate part thereof, substantially the entire width of the shelf 10, by a portion of the crosspiece body 32, but it is still perfectly suitable for supporting items to be preserved on the shelf 10.

[0031] In a preferred embodiment, a first portion of the crosspiece body 32 which remains exposed at the above said rest surface is provided with surface notches or seats 32a, herein being substantially semi-circular-shaped, suitable to facilitate the positioning and resting of items to be preserved, such as in particular items to be maintained at a reclined position on the shelf, such as bottles, one of which is indicated with B in figures 4 and 11.

[0032] Observable in figure 13 is a second position of use of the shelf 10, wherein the movable section is substantially folded over the stationary section. Figure 12 instead illustrates an intermediate position with respect to that of figures 11 and 13, wherein the plate 31 is rotated

by about 90° with respect to the position of figure 11. The two positions of figures 12 and 13 are allowed by the possibility to rotate the movable section around the fixed axis obtained through the hinges 23, 33.

[0033] From figures 12 and 13 it is observable how, advantageously, also provided for in a second portion of the crosspiece body 32, substantially opposed to the abovementioned said first portion, are notches or seats 32b, similar to notches 32a and having similar function, useable when the movable section is at the position of use folded over the stationary section (figure 13).

[0034] In the illustrated embodiment, also the front end part of the movable shelf section is provided with a longitudinally extended transverse member, indicated with 34 and hereinafter referred to as front crosspiece, preferably in form of a framework member or profile applied on the front edge of the plate 31. As observable, this transverse member 34 has, at the respective longitudinal ends, corner portions 34a which also cover the corners of the plate 31, mainly for protection purposes. These corner portions 34a may have a part that is extended to the lower part to the plate 31, as in the illustrated case, so as to be able to lie on the projections 24 of the projecting portions 22b of the sides 22, in order to avoid direct contact between the projections 24 and the plate 31.

[0035] In a preferred embodiment, the rear crosspiece 32 of the movable shelf section is provided with at least one throat or seat 35, observable for example in figures 12-14, adapted to receive part of the front region of the stationary section. In the illustrated example this throat 35 is practically extended over the entire width of the rear crosspiece 32 and in a position such that, when the movable section is at the position of use of figures 1-4 and 11, received therein is at least part of the front edge of the plate 21, as observable for example in figure 6.

[0036] In a preferred embodiment, also the rear region of the stationary shelf section is provided with a longitudinally extended transverse member, indicated in its entirety with 25, preferably in form of frame member or profile applied onto the rear edge of the plate 21, preferably in such a manner to also cover the respective corners thereof. In the illustrated example the crosspiece 25 is provided - at its lower part - with fins 25a which form, alongside the main body of the same crosspiece, seats or coupling means intended to cooperate with the projections 6, as clearly observable for example in figure 2.

[0037] Preferably, the sides 22 of the shelf 10 are coupled to the rear crosspiece 25, particularly hooked thereto. Provided for this purpose in the embodiment exemplified in the figures are the projections provided with the coupling means 22f and 22g of figures 8-10, intended to be alternatively coupled to the crosspiece 25. Regarding this, it should be pointed out that the shelf 10 is conceived in a manner that the stationary shelf section may be obtained using plates 21 having two different lengths, for example about 170 mm and about 177 mm; in case a shorter plate 21 is used, the coupling of the sides 22 to

the rear crosspiece 35 is obtained by using the shorter projections, provided with the coupling means 22f; vice versa, when using a longer plate, the coupling is obtained by using the longer projections, provided with coupling means 22g. In the example, the coupling means 22f are intended to be coupled to the edge of a lower or rear wall of the crosspiece 25, while the coupling means 22g are intended to be coupled to the fins 25a. Obviously, the crosspiece 25 may be differently configured at its rear part, so as to define the two regions for coupling the abovementioned projections. The fact that the sides 22 are connected to the rear crosspiece 25 allows enhancing the structural sturdiness of the shelf 10 and obtain an improved distribution of loads weighing on the same. It shall be observed that, for example, with this embodiment, part of the weight of the load that weighs on the movable section is efficiently transferred, through the sides 22 and the crosspiece 25, to the stationary section, with the latter being coupled with the support means 6. Advantageously, the use of fins 25a with the projections 6 avoids possible capsizing risks.

[0038] The projecting portions 22b of the sides 22 are shaped in such a manner to have, at the respective front end region, a laterally-directed widening, as well observable for example in figures 4, 8 and 10. This widened part of the portions 22b is intended for insertion into a recess 7, as observable in figures 1-3. As shown, the projections 24 are formed in the same zone of a portion 22b where the widened part is located cooperating with the respective recess 7, all to the advantage of the stability of the shelf. The rear crosspiece 25 advantageously has, in its upper part, an elevated bottom wall 25b, which may serve as a rear rest for the items arranged on the shelf 10, such as for example bottles B.

[0039] The construction of the shelf 10 is very simple. The sides 22 and the crosspiece 32 are advantageously obtainable each in a single piece made of plastic material, for example molded thermoplastic material, in such a manner to also integrate the respective hinge parts 23, 33. Advantageously, the sides 22 have a section that is hollow and open at the lower part, as observable in figure 9, which may be reinforced through transverse and/or longitudinal ribs at least at the part bearing the articulation means and at the part provided with the projection 24 and the widening intended to cooperate with the respective recess 7. Also the crosspieces 25 and 34 may be made of plastic or thermoplastic material in a single piece or in at least two parts that are joined together, for example through snap-coupling or welding or bonding, having an edge portion of the respective plate 21 or 31 interposed. Preferably, the various frame members are provided with seats or throats for receiving the respective edge portions of the plates 21 or 31. The plates 21 and 31 may be made of any desired material, for example glass.

[0040] Also the assembly of the shelf 10 is very simple; figures 14-18 illustrate a possible assembly sequence. Regarding this, it should be pointed out that the coupling

between the frame members 22, 25 and 32, 34 to the respective plates 21, 31 is preferably of the snap-coupling type, though use of other fixing means (such as adhesives or threaded means) is not excluded. For this purpose, preferably, at least one of the larger faces of the plates 21, 31 is provided with recesses or grooves in proximity to a respective edge, for coupling with the coupling means provided for in a respective frame member. For example, indicated with 21a in figure 14 are recesses or longitudinal grooves which are extended substantially parallel to the two side edges of the plate 21, and they are obtained on the upper surface of the plate itself.

[0041] The rear crosspiece 25 is applied to the rear edge of the plate 21, and for this purpose the crosspiece itself is provided with a throat for receiving the abovementioned edge. This throat, observable for example in figure 6, is provided with teeth or reliefs for a coupling of the type similar to those indicated with 22d in figure 8. On one of its larger surfaces, in proximity to the rear edge and parallel thereto, the plate 21 has a surface groove, similar to those indicated with 21a, wherein the abovementioned reliefs are coupled, with a hooking between the plate 21 and the rear crosspiece 25 substantially snap-coupled or possibly sliding (along the sides 22a). Analogous reception throats, coupling reliefs and surface grooves are used for coupling the crosspieces 32 and 34 to the rear and front edges of the plate 31 respectively.

[0042] The sides 22 are applied on the side edges of the plate 21 through the portions 22a, provided with throats 22c specifically for the purpose, preferably with a sliding insertion. For such purpose, the sides 22 are first positioned in such a manner that the pins 33a of the hinge parts 33 of the crosspiece 32 are inserted into the seats 23a of the hinge parts 23. As mentioned previously (see for example figures 8-10), the mouth of the lower portion of the abovementioned seats 23a has a larger diameter with respect to the seat of the upper portion, in such a manner that the cylindrical pins 33a may be fitted freely thereinto. Therefore, in this step of the assembly, the pins 33a essentially occupy the lower portion of the seats 23a, as partly observable in figure 17.

[0043] Then, the plate 31 provided with the respective rear crosspiece is inserted into the throats 22c of the sides 22, such throats being open at the rear end (see figure 8). In this step, the reliefs 22d provided for inside throats 22c are coupled with the longitudinal grooves 21a of the plate 21; this step of assembly is essentially illustrated in figure 15.

[0044] Almost at the end of the insertion of the plate 21 into the throats 22c of the sides 22, the front edge of the plate reaches contact with a part of the crosspiece body 32 of the movable shelf section. At this point, the movable shelf section is moved upwards, in such a manner that the pins of the movable hinge parts 33 end up occupying the upper portion of the seats 23a of the fixed hinge parts 23, as deducible for example from figure 18. After raising the movable shelf section, insertion into the throats 22c of the plate 21 -whose front edge region ends

up lodged beneath the pins 33a, as clearly observable in figure 7 - is completed. In such manner, the plate 21 maintains the pins 33a at the upper portion of the seats 23a: as explained, the mouth of such upper portions has a reduced diameter, such that the cylindrical pins 33a cannot come off the seats 23a. The completion of insertion of the plate 21 into the throats 22c also causes the snap-coupling between the sides 22 and the rear crosspiece 25 of the stationary shelf section. Provided for such purpose are the fins with the coupling means 22f, 22g: as explained beforehand, depending on the length of the plate used, the crosspiece 25 shall be coupled to the coupling means 22f (shorter plate) or to the coupling means 22g (longer plate). This is shown in the condition of figure 16, of the assembled shelf 10. Thus as observable, the hinging between the two plates 21 and 31 is obtained in a very simple manner and using only three components.

[0045] Without prejudice to the underlying principle of the invention, the details and embodiments may vary, even significantly, with respect to what has been described herein by way of non-limiting example only, without departing from the scope of the invention as defined by the claims that follow.

[0046] Obviously, some relative terms used in the previous description, such as "front" and "rear" are to be interpreted with respect to the illustrated embodiment, thus considering, for example, that the shelf or its support system in the compartment could be configured in a manner opposed to the one illustrated (for example with the stationary section at the front part of the compartment and the movable section at the rear part of the same).

[0047] In a variant, less advantageous from a construction point of view, the transverse member 32 may be replaced by at least two separate components having similar functions, and hence each integrating the relative movable hinge part 33 and/or at least a part of the throat 35 and/or a part of the recesses 32a, 32b.

[0048] In another embodiment, the projecting portions 22b of the sides 22 which provide the support for the movable section 31 may be extended beneath such movable section, instead of along its side edges like in the case exemplified in the figures.

[0049] The means for coupling the sides 22 to the rear crosspiece 25 according to two alternative methods could be provided for on the crosspiece instead of on each side.

[0050] Obviously, the support means of the shelf, provided for at the opposed side walls of the compartment, may also be different from the ones illustrated.

Claims

1. Refrigerating appliance comprising a cabinet (2) with a preservation compartment (3) having an intermediate shelf (10) that is removably supported by way of support means (6-7) provided at opposed side walls (3a) of the compartment (3), wherein the shelf

(10) comprises at least one stationary shelf section (21) and one movable shelf section (31) being articulated to each other such that the movable shelf section (31) can be made to rotate relative to the stationary shelf section (21) between at least two positions of use, at a first position of use a first end of the movable shelf section (31) being close to a first end of the stationary shelf section (21) with the two shelf sections (21, 31) that are substantially co-planar to form therebetween a substantially continuous rest surface for supporting items to be preserved, the stationary shelf section (21) being provided, at opposed side regions thereof, with respective fixed side members (22) each having a fixed hinge part (23), **characterized in that** each side member (22) has a respective part (22b) that projects longitudinally beyond the first end of the stationary shelf section (21), substantially in a cantilever fashion, and that includes at least one support (24) for supporting the movable shelf section (31) when the movable shelf section is in the first position of use, and **in that** the first end of the movable shelf section (31) has a longitudinally extended transverse member (32) having a transverse throat or seat (35) within which, when the movable shelf section (31) is in the above said first position of use, at least part of the first end of the stationary shelf section (21) is received.

2. Appliance according to claim 1, wherein the end of the stationary shelf section (21) being opposed to the first end thereof has a longitudinally extended transverse member (25) to which the side members (22) are coupled, particularly by means of snap means (22f, 22g).
3. Appliance according to claim 1 or 2, wherein the longitudinally extended transverse member (32) has at least one of:
 - a pair of movable hinge parts (33), each being provided at a respective longitudinal end of the transverse member (32) and operatively coupled with a fixed hinge part (23) of a respective side member (22) of the stationary shelf section (21), and
 - a rest portion having notches or seats (32a, 32b) for positioning items to be preserved on the shelf (10), particularly in a reclined position, such as bottles (B).
4. Appliance according to claim 2, wherein at least one of the side members (22) and the transverse member (25) has first coupling means (22f) and second coupling means (22g), that can be used alternatively for coupling to the other one of the side members (22) and the transverse member (25) depending upon the length of a substantially plate-shaped body (21) of the stationary shelf section.

5. Appliance according to claim 3, wherein, in the above said second position of use, the movable shelf section (31) is substantially turned over the stationary shelf section (21) and wherein the transverse member (32) has a first and a second rest portion substantially opposed to each other, each rest portion having said notches or seats (32a, 32b), the first rest portion being usable when the movable shelf section (31) is in the above said first position of use and the second rest portion being usable when the movable shelf section (31) is in the above said second position of use. 5
6. Appliance according to claim 1, wherein the movable shelf section (31) has a pair of movable hinge parts (33), each operatively coupled with a fixed hinge part (23) of a respective side member (22) of the stationary shelf section (21), the fixed hinge parts (23) and the movable hinge parts (33) being positioned such that the movable shelf section (31) is rotatable according to an axis that extends higher than said substantially continuous rest surface. 10 15 20
7. Appliance according to claim 3 or claim 6, wherein the movable hinge parts (33) have each a pin element (33a) and the fixed hinge parts (23) have each a cavity (23a) for receiving the respective pin element (33a), which cavity has two portions with different mouth dimensions, at least one said portion being shaped to retain the pin element (33a) thereinto. 25 30
8. Appliance according to claim 1, wherein the shelf sections (21, 31) and the side members (22) are configured such that side edges of the movable shelf section (31), when the movable shelf section is in the above said first position of use, face the projecting parts (22b) of the side members (22), and wherein from surfaces of the projecting portion (22b) of the two side members (22) that face each other there project supports (24) for the movable shelf section (31). 35 40
9. Appliance according to claim 1, wherein the support means (6-7) provided at opposed side walls (3a) of the compartment (3) comprise, for each wall (3a), at least one support element (7) cooperating with the projecting part (22b) of a respective side member (22) of the stationary shelf section (21), where in particular the support means comprises, for each wall (3a), at least two support elements (6, 7) being spaced apart from each other in a depth direction of the compartment (3). 45 50
10. Appliance according to one or more of the preceding claims, wherein the two shelf sections comprise each a substantially plate-shaped body (21, 31), particularly made of glass or a transparent material, and 55
- wherein each side member (22) and/or each transverse member (25, 32, 34, 35) is substantially configured as a frame member that hides at least a prevailing part of a respective edge of the corresponding plate-shaped body (21, 31).
11. Refrigerating appliance shelf designed to be removably supported within a preservation compartment (3), by way of support means (6-7) provided at opposed side walls (3a) of the compartment (3), wherein the shelf (10) comprises at least one stationary shelf section (21) and one movable shelf section (31) being articulated to each other such that the movable shelf section (31) can be made to rotate relative to the stationary shelf section (21) between at least two positions of use, at a first position of use a first end of the movable shelf section (31) being close to a first end of the stationary shelf section (21) with the two shelf sections (21, 31) that are substantially coplanar to form therebetween a form a substantially continuous rest surface for supporting items to be preserved, at least the stationary shelf section (21) being provided, at opposed side regions thereof, with respective side members (22) each having a fixed hinge part (23), **characterized in that**
 - each side member (22) has a respective part (22b) that projects longitudinally beyond the first end of the stationary shelf section (21), substantially in a cantilever fashion, and that includes at least one support (24) for supporting the movable shelf section (31) when the movable shelf section is at the first position of use, and/or
 - the first end of the movable shelf section (31) has a longitudinally extended transverse member (32), particularly a frame member, having at least one of:
 - a pair of movable hinge parts (33), each being provided at a respective longitudinal end of the transverse member (32) and operatively coupled with a fixed hinge part (23) of a respective side member (22) of the stationary shelf section (21),
 - a transverse seat (35) within which, when the movable shelf section (31) is in the above said first position of use, at least part of the first end of the stationary shelf section (21) is received, and
 - a rest portion having notches or seats (32a, 32b) for positioning items to be preserved on the shelf (10), particularly in a reclined position, such as bottles (B).
12. Method for assembling a refrigerating appliance shelf comprising one stationary shelf section (21) and one movable shelf section (31) articulated to each other such that the movable shelf section (31)

can be made to rotate relative to the stationary shelf section (21) between at least two positions of use, wherein the stationary shelf section comprises a support body (21) and fixed side members (22) each having a fixed hinge part (23), each side member (22) having a seat (22c) for receiving a respective part of the edge of the support body (21), and wherein the movable shelf section (31) is provided, at opposed side regions thereof, with a movable hinge part (33), the method comprising:

- coupling a longitudinally extended transverse member (25) to a first end of the support body (21);
- providing each side member (22) with a respective support part (22b) that projects longitudinally, substantially in a cantilever fashion, beyond a second end of the support body (21) that is opposed to the said first end, wherein the support part (22b) has at least one support means (24) for supporting the movable shelf section (31) when the movable shelf section is in one said position of use;
- providing at least one of the transverse member (25) and the side members (22) with means (22f, 22g) for coupling with the other one of the transverse member (25) and the side members (22);
- restraining the side members (22) to the movable shelf section (31), by coupling the fixed hinge parts (23) with the movable hinge parts (33), and subsequently inserting in a sliding way the support body (21) in the receiving seats (22c) that face each other of the two side members (22), starting from the end of the seats (22c) that is opposed to the above said support parts (22b), until causing engagement of said means for coupling (22f, 22g).

13. Method according to claim 12, comprising:

- forming each fixed hinge part (23) with a cavity (23a) for receiving a pin element (33a) of the respective movable hinge part (33), wherein the cavity (23a) is formed with a first portion shaped to allow insertion therein of the pin element (33) and a second portion shaped to retain the pin element (33a) therein;
- causing insertion of the pin elements (33a) in the respective first portions of the receiving cavities (23a);
- inserting in a sliding way the support body (21) in the receiving seats (22c) of the side members (22), until the above said second end of the support body (21) interferes with the movable shelf section (31);
- translating the movable shelf section (31) relative to the side members (22), so as to bring

the pin elements (33a) to occupy the second portion of the receiving cavities (23a);

- continuing the insertion of the support body (21) in the receiving seats (22c) of the side members (22) until causing engagement of said means for coupling (22f, 22g).

14. Method according to claim 12 or 13, wherein said means for coupling (22f, 22g) comprise first coupling means (22f) and second coupling means (22g), that can be used alternatively for coupling the side members (22) to said transverse member (25) depending upon the length of the support body (21).

15. Method according to at least one of the preceding claims, wherein the end of the movable shelf section (31) directed towards the stationary shelf section (21) is provided with a respective longitudinally extended transverse member (32) that is formed to have at least one of:

- said movable hinge parts (33), each at a respective longitudinal end of the transverse member (32),
- a transverse throat or seat (35) adapted to receive at least part of the said second end of the stationary shelf section (21), and
- a rest portion having notches or seats (32a, 32b) for positioning items to be preserved on the shelf (10).

Fig. 1

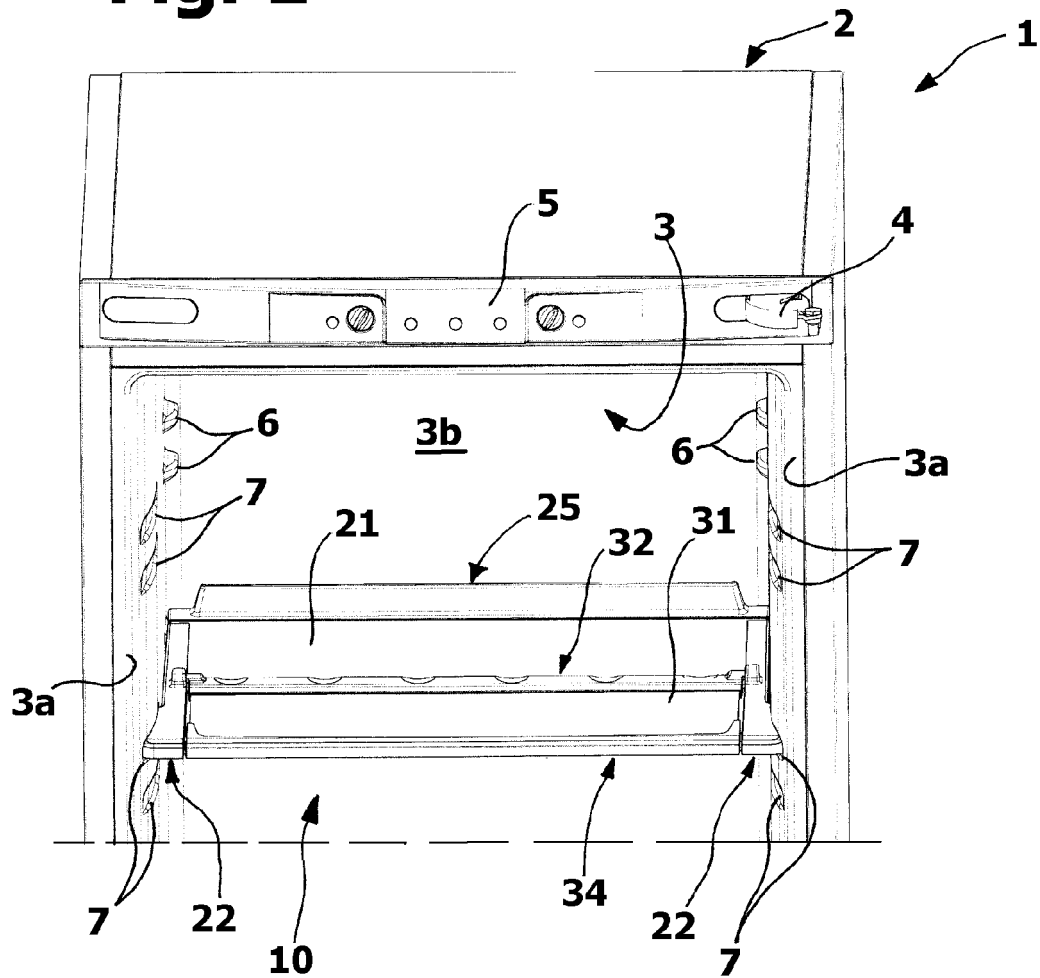
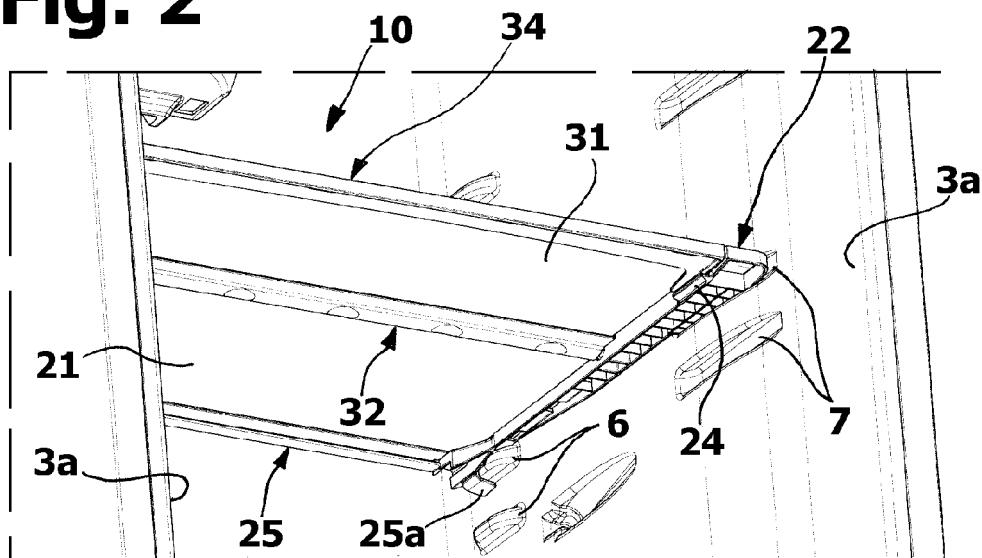


Fig. 2



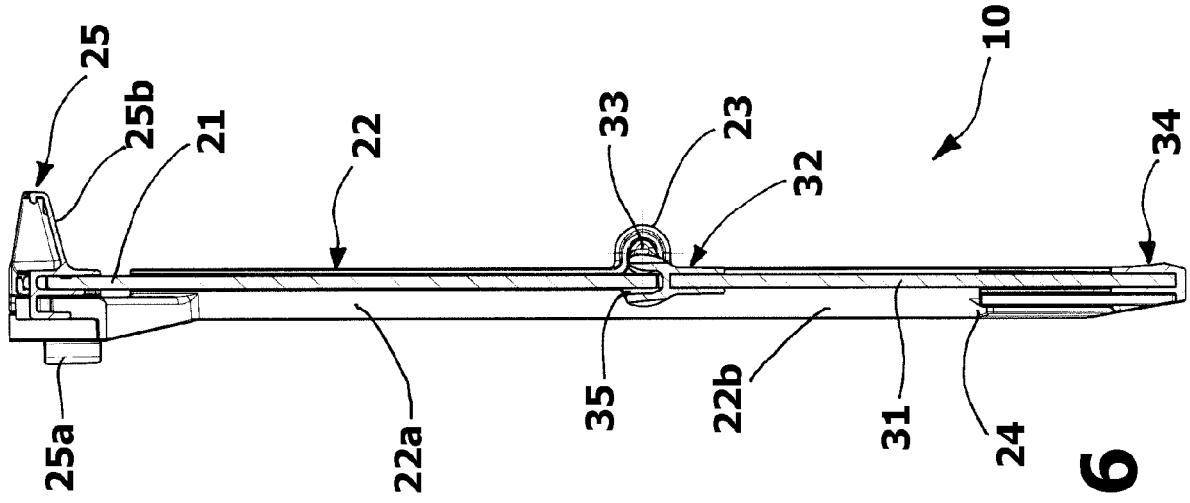


Fig. 6

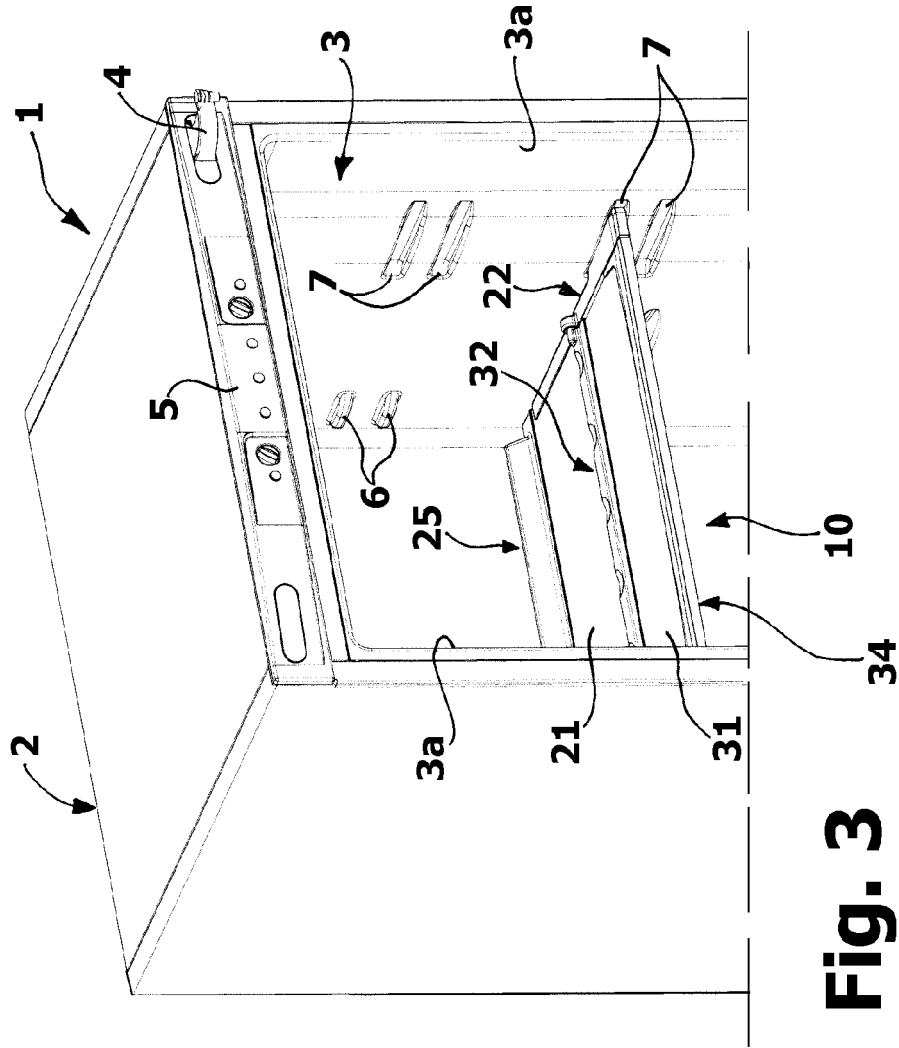


Fig. 3

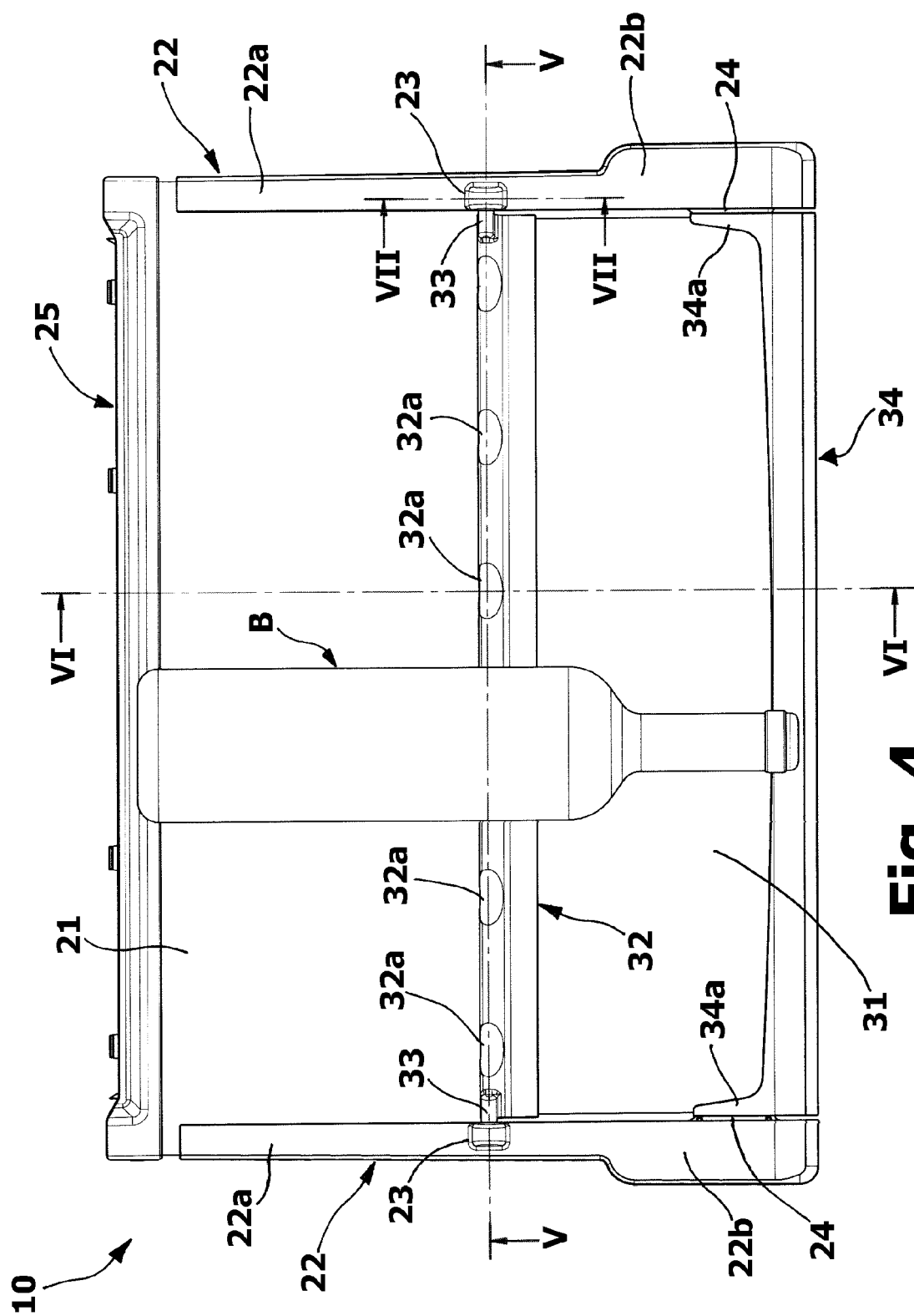
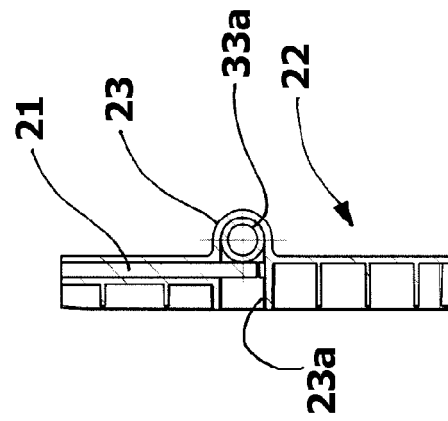
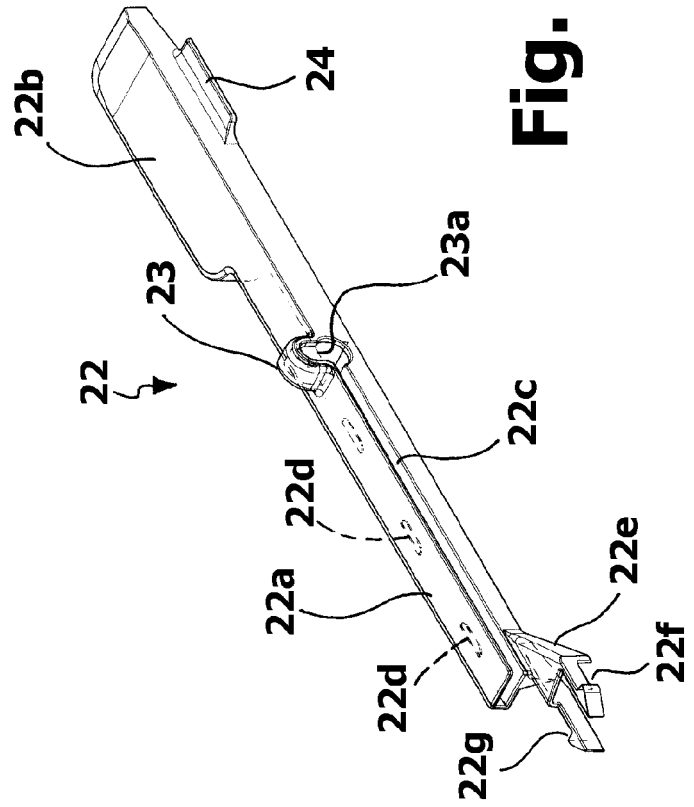
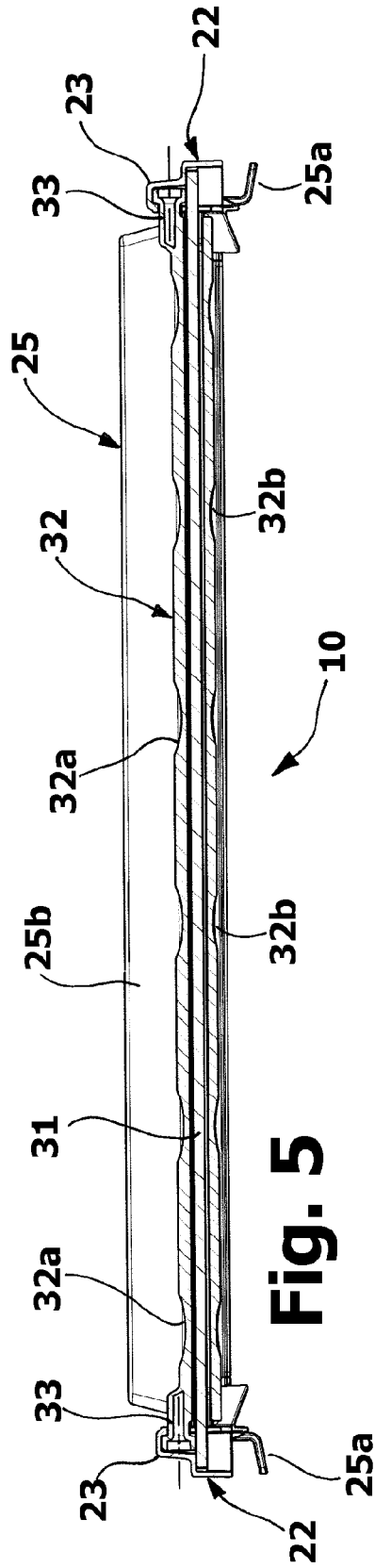
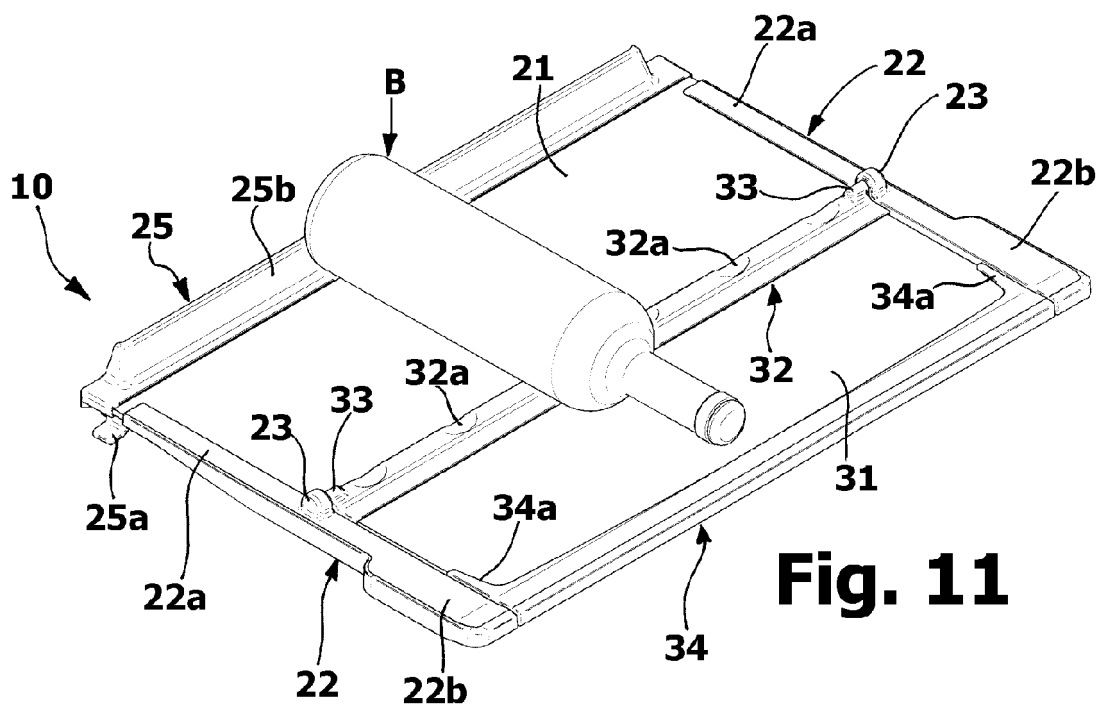
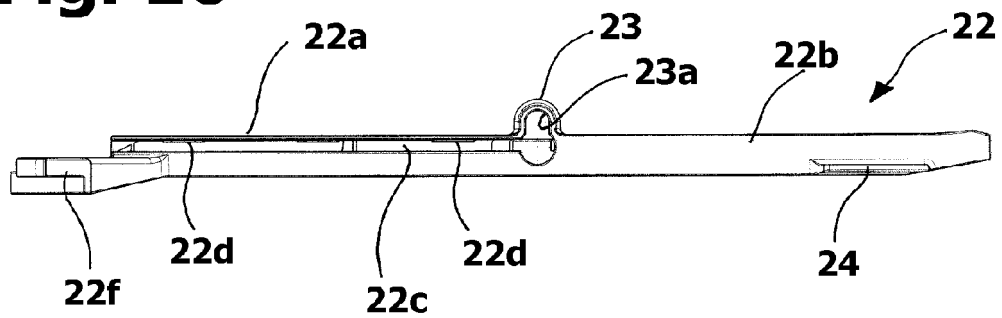
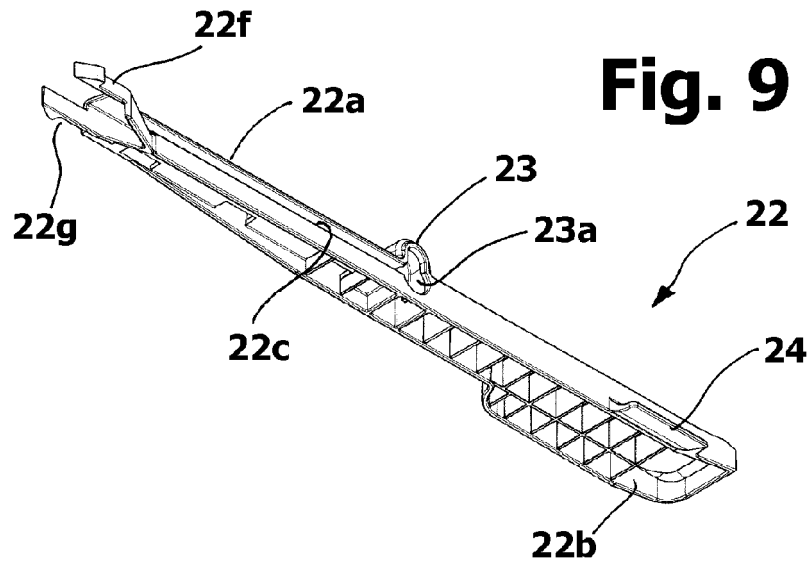


Fig. 4





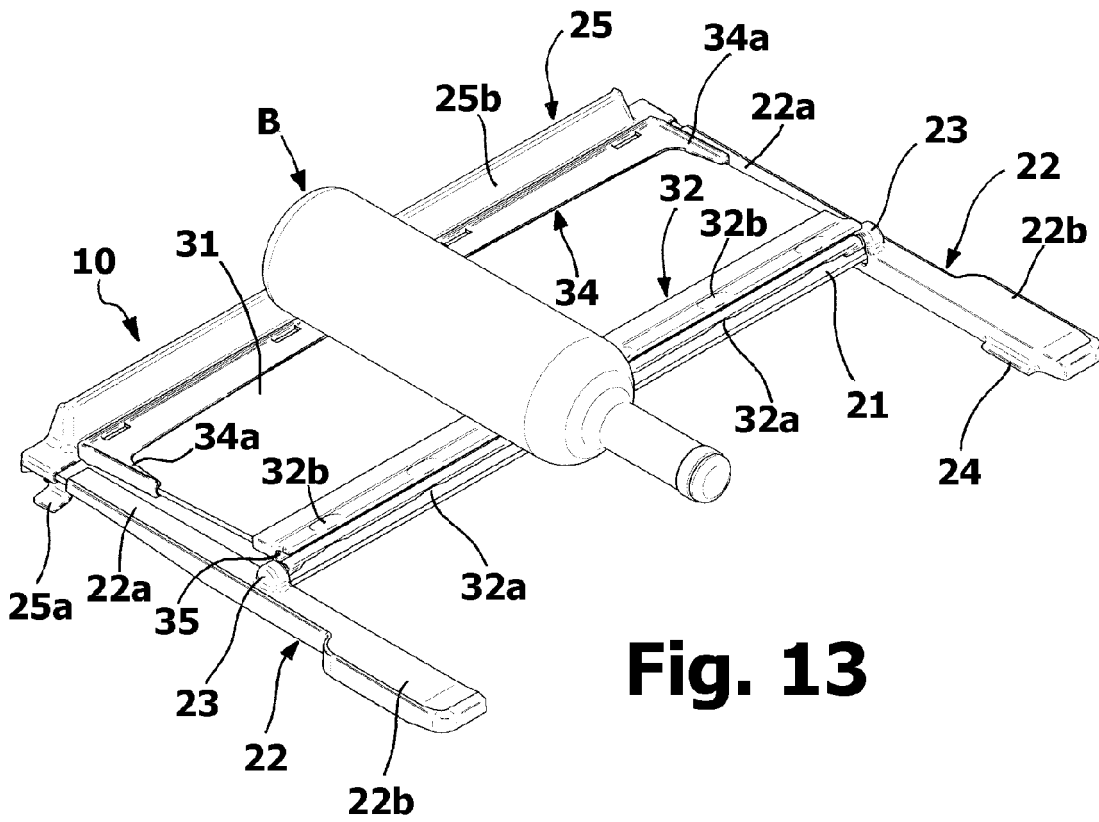
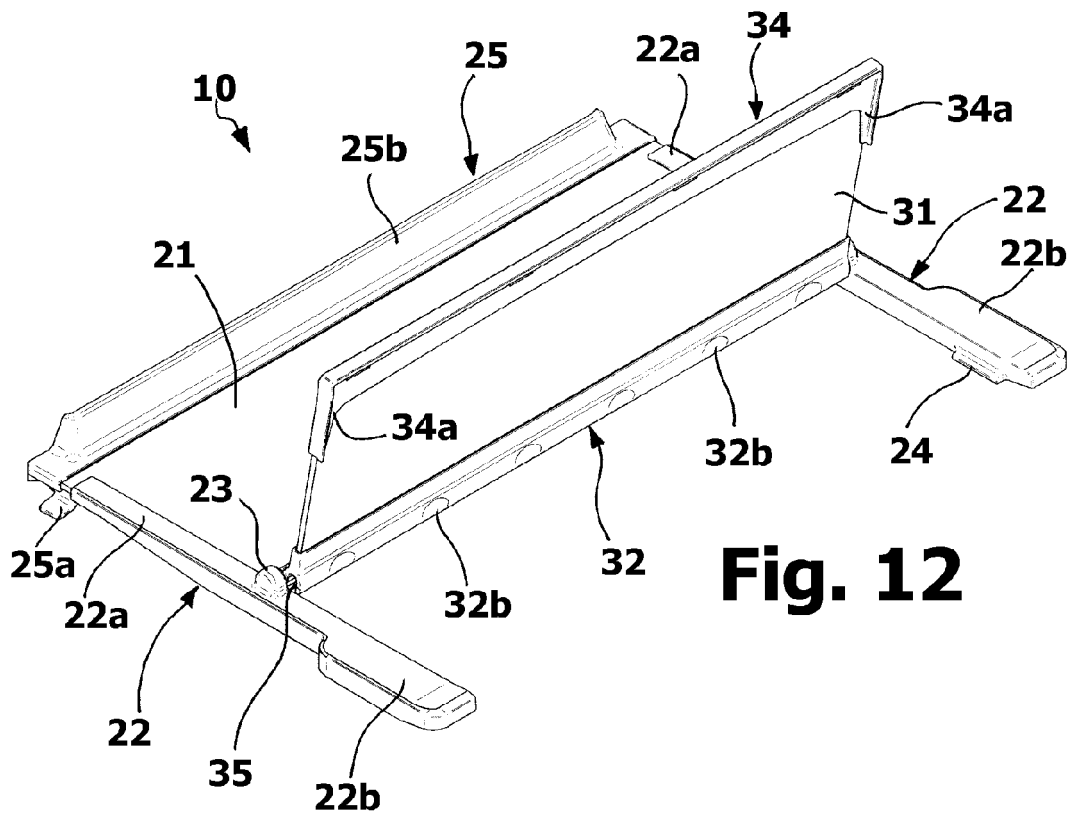


Fig. 14

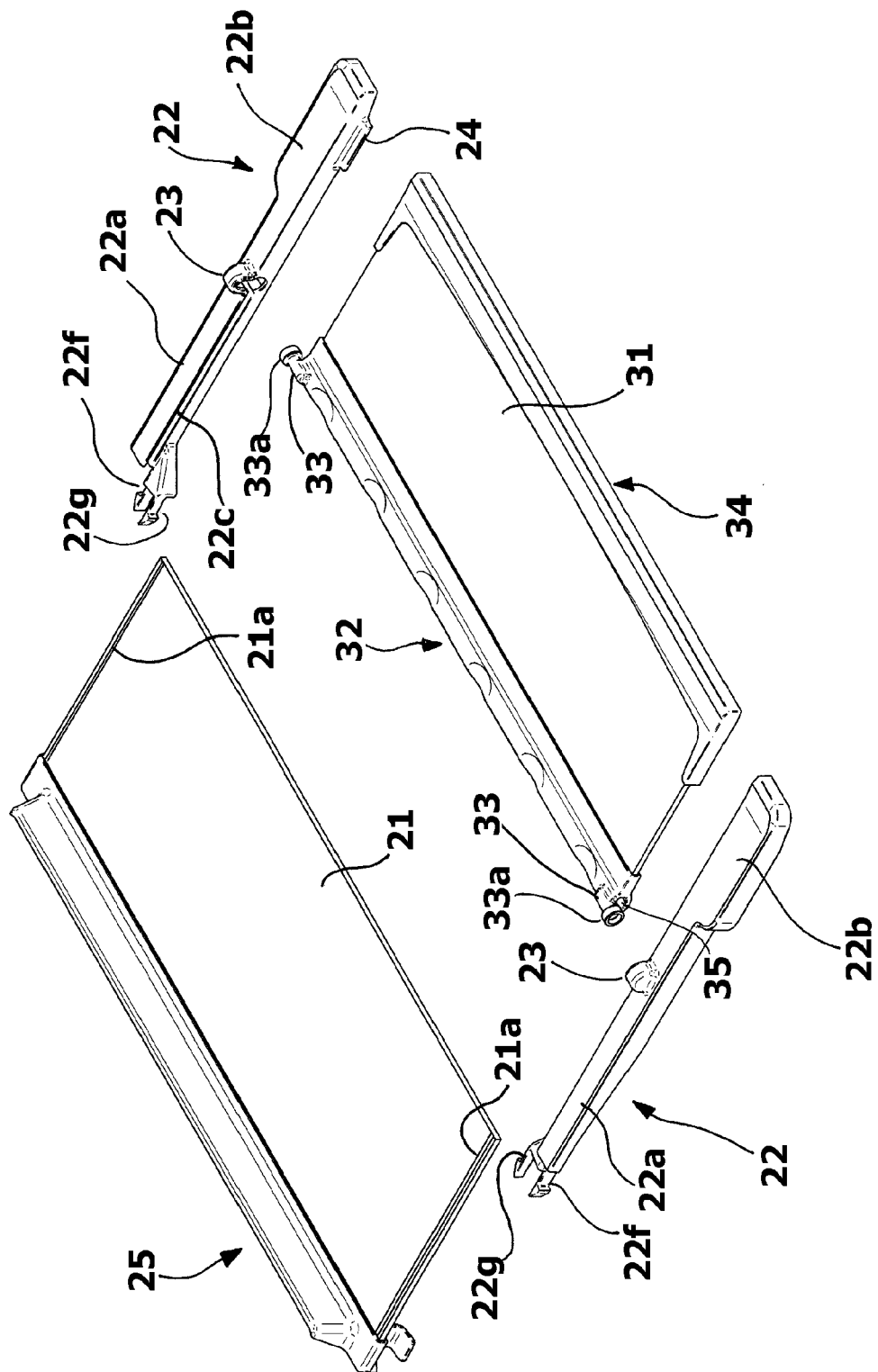


Fig. 15

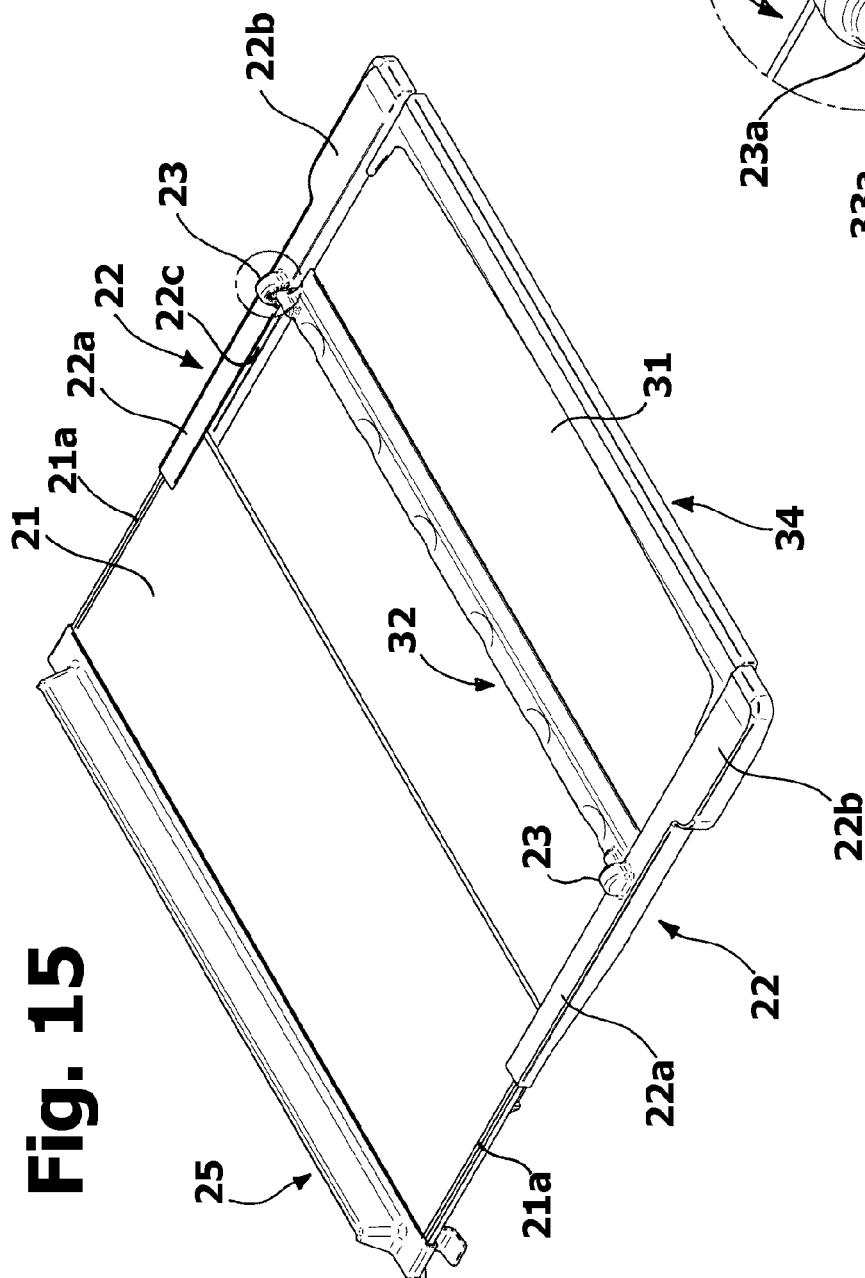
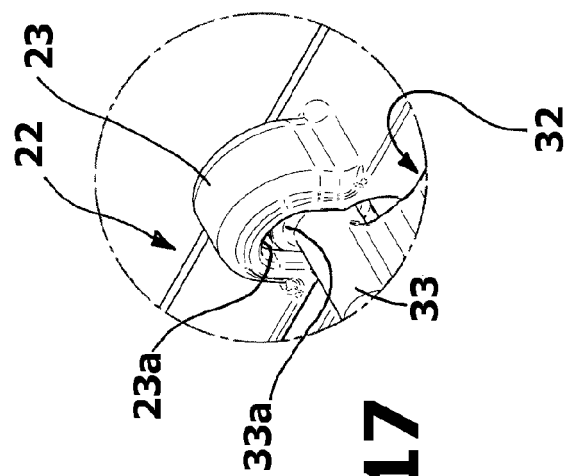


Fig. 17



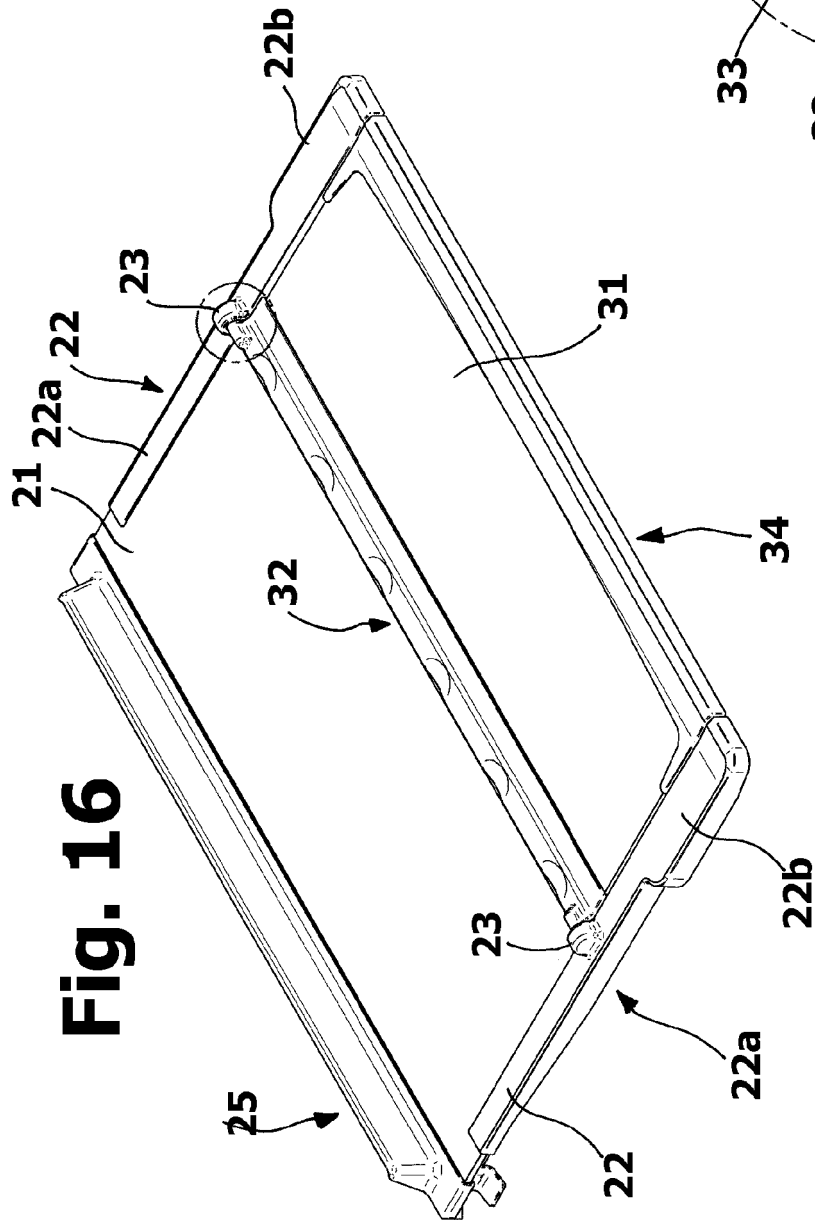


Fig. 16

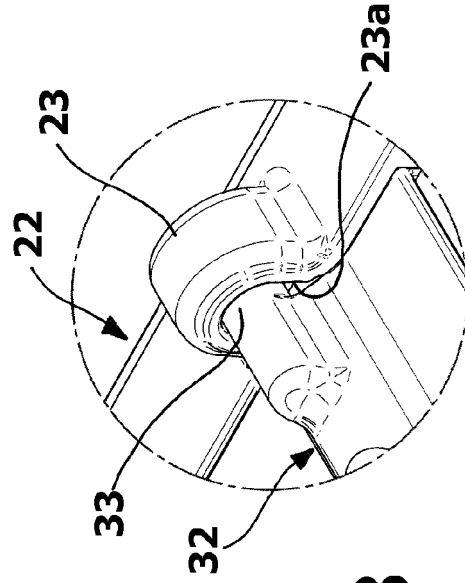


Fig. 18



EUROPEAN SEARCH REPORT

Application Number
EP 09 17 4923

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 90 06 675 U1 (BOSCH-SIEMENS HAUSGERÄTE GMBH) 23 August 1990 (1990-08-23) * figures 1-4 *	1-15	INV. F25D25/02
Y	WO 2008/004374 A1 (SHARP KK [JP]; KANAYAMA ZAIYU [JP]; YOSHIMURA HIROSHI [JP]) 10 January 2008 (2008-01-10) * abstract; figures 2-9 *	1-15	
A	KR 2004 0070986 A (LG ELECTRONICS INC) 11 August 2004 (2004-08-11) * abstract; figures 1-10 *	1-15	
A,D	WO 2006/018757 A1 (ARCELIK ANONIM SIRKETI [TR]; CETINTURK OGUZ [TR]; AYVERDI METIN [TR]) 23 February 2006 (2006-02-23) * abstract; figures 1-9 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		18 February 2010	Yousufi, Stefanie
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03-82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 17 4923

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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18-02-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9006675	U1	23-08-1990	ES 1017793 U 01-01-1992
			FR 2663411 A1 20-12-1991
			IT MI910491 U1 13-12-1991
			IT MI911542 A1 13-12-1991

WO 2008004374	A1	10-01-2008	CN 101495827 A 29-07-2009
			JP 4077012 B2 16-04-2008
			JP 2008014564 A 24-01-2008

KR 20040070986	A	11-08-2004	NONE

WO 2006018757	A1	23-02-2006	EP 1787076 A1 23-05-2007
			RU 2358212 C2 10-06-2009
			TR 200700955 T1 21-06-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2006018757 A [0003]
- KR 20040070986 [0005]
- DE 9006675 U [0006]