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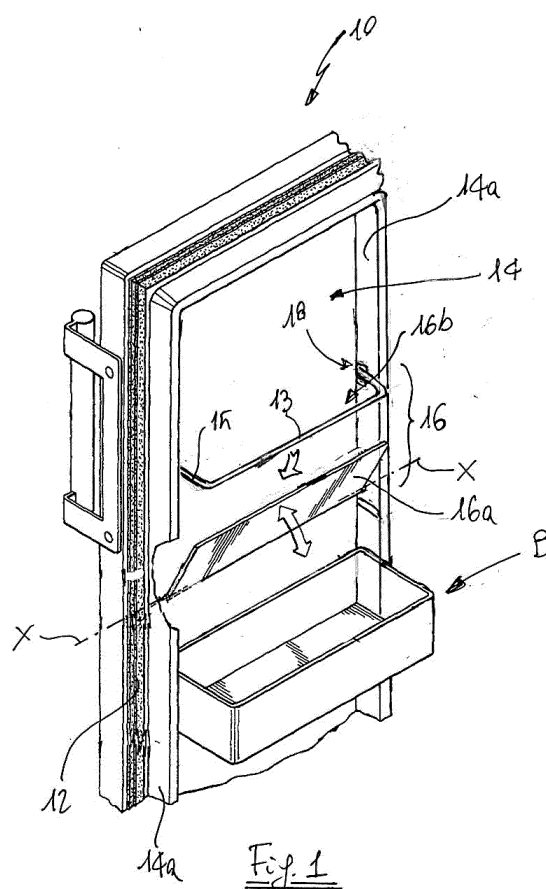
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(54) **Refrigerator door**

(57) A refrigerator door (10) comprises an inner liner on which at least one support (B, 16) for goods is mounted. Such support (16) comprises a first plastic plate-shaped element (16a) which is hinged to the liner (14) and which can assume an horizontal configuration and a substantially vertical configuration, and a second metal U-shaped element (16b) which is hinged to the liner (14) and which can assume an horizontal configuration and a substantially vertical configuration.



Description

[0001] The present invention relates to a refrigerator door comprising an inner liner on which at least one support for goods is mounted.

[0002] A refrigerator door of the above kind is disclosed by EP937223. In this known solution storage bins are arranged one above the other on the inner liner, and the storage bin base section can be folded up towards the inner liner so that the top of high items can poke through without removing the bin.

[0003] This solution has the problem of a difficult insertion of high items (for instance wine bottles with long necks) in the upper bin having the folded bottom and in the lower bin. Moreover, in a refrigerator provided with such storage bins there is still the problem of removing the bins when big objects are stored on shelves of the refrigerator compartment, such objects interfering with the bins. Even if such bins are removed from the door, the user may have problems in storing them outside the refrigerator, leaving aside the related problem that such removed bins can get lost and sometimes subject to breaks while handling.

[0004] An object of the present invention is to provide a refrigerator door which does not present the above drawbacks and is simple and economical to be mass produced.

[0005] Such object is reached thanks to the features listed in the appended claims.

[0006] According to the invention, it is possible to have a foldable bin created for flexible placement of goods in a refrigerator door which increases an effective utilization of space in such door.

[0007] The bin is made by a first part shaped as a plate hinged to the liner and by a second part placed above and at a certain distance from the first part, shaped as a U-shaped frame element hinged to the liner. When both such base and U-shaped frame elements are folded towards the liner, the space of the door is free to be filled with high items placed in a bottom bin or in a shelf of the refrigerator, without the need of removing anything from the door.

[0008] Further advantages and features according to the present invention will become clear from the following detailed description, with reference to the attached drawings in which:

- Figure 1 is a perspective view of a portion of a refrigerator door according to the invention;
- Figure 2 shows the assembly position when a bin according to the invention rests on the liner of refrigerator door;
- Figure 2a is an enlarged view of a detail of figure 2;
- Figure 3 shows the assembly position when bin plate is folded in a 90° configuration and is substantially flush with the liner;
- Figure 3a is an enlarged view of a detail of figure 3;
- Figure 4 shows the assembly position when the up-

per rod element is moved 90° down; and

- Figure 4a is an enlarged view of a detail of figure 4.

[0009] With reference to the drawings, a refrigerator door 10 is provided with a peripheral gasket 12 and with a plastic inner liner 14. Such inner liner 14 is shaped so that a raised edge 14a is defined around its perimeter. Of course such raised edge can define a single zone or multiple adjacent zones in which the storage space of the liner can be divided.

[0010] In the example shown in figure 1, on the liner 14 it is mounted a traditional bin B which has side portions which can cooperate with a corresponding shaped portion of the liner. In a position higher than the traditional bin B, the example of figure 1 shows a bin 16 according to the invention which is made by a first portion 16a configured as a plastic plate hinged to the liner along an horizontal axis X-X, and by a second portion 16b configured as a metal bar which is U-shaped, is hinged in 18 to the liner 14 and has a perimeter which, in the horizontal position shown in figure 1, corresponds substantially to the perimeter of the plate 16a below.

[0011] The first portion or plate 16a of the bin 16, in its operative configuration shown in figure 2, rests against two raised portions 20 of the liners 14. Even if not shown in the example of the drawings, the plate 16a can have a peripheral small raised rim so that small items placed thereon do not risk falling down from the bin.

[0012] In the configuration shown in figure 3, the plate 16a is rotated towards the liner 16 so that it is substantially in contact therewith. The vertical position can be maintained by placing the rotation axis X-X slightly detached from the surface of the liner 14, or by using other well known fastening means as snap-engaging fasteners or magnetic fasteners.

[0013] In figure 4 is it shown the configuration where the second element 16b of the bin 16 is folded down on the already folded plate 16a. The U-shaped second element 16b presents a central rectilinear portion 13, two bent parallel portions 15 and two ends 17.

[0014] The second element 16b presents also cantilevered portions 22 which, in the configuration shown in figure 1, 2 and 3, rest on raised portions 24 of the liner. Moreover, each end 17 of the second element 16b which is hinged to the liner 14 is placed in a bloc-shaped guide 26 of the liner having a two-position cam-shaped slot 27 (figures 2a and 4a). In a first configuration the ends 17 of the second element 16b are in a rear position of the slot 27 so that such second element 16b is maintained in a horizontal position thanks to the cantilevered portions 22 which match the raised portions 24 of the liner 14. When the second element 16b is moved by the user toward the front, then the ends 17 move towards a front position of the slot 27 so that the cantilevered portions 22 are no longer matching the raised portions 24 and then such second element 16b can be moved 90° down (figure 4). In this position the composed bin is locked on liner 14 with a rubber bush 28 or with a similar fastening

means (for instance magnetic) so that full space is available for placing large height goods in bottom bin B.

[0015] Of course the refrigerator door 10 can be provided with a plurality of bins 16 according to the present invention, i.e. without traditional bins B.

[0016] The foldable composite bin 16 according to the invention does allow an effective utilization of door space, an easy and flexible placing of goods, a cost effective solution compared to existing design and it is aesthetically attractive and of robust in design.

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7. Refrigerator provided with a door according to any of the preceding claims.

Claims

1. Refrigerator door (10) comprising an inner liner (14) on which at least one support (B, 16) for goods is mounted, **characterized in that** such support (16) comprises a first plate-shaped element (16a) which is hinged to the liner (14) and which can assume an horizontal configuration and a substantially vertical configuration, and a second U-shaped element (16b) which is hinged to the liner (14) and which can assume an horizontal configuration and a substantially vertical configuration.
2. Refrigerator door according to claim 1, wherein the U-shaped element is a metal bar element (16b).
3. Refrigerator door according to claim 1 or 2, wherein the U-shaped element (16b) presents a central rectilinear portion (13), two bent parallel portions (15) and two end portions (17) which are hinged to guides (26) in the liner (14), the two bent parallel portions (15) being provided with auxiliary cantilevered rods (22) substantially parallel to the central portion (13) and configured to cooperate with raised portions (24) of the liner (14) for maintaining the U-shaped element (16b) in its horizontal configuration.
4. Refrigerator door according to claim 3, wherein the guides (26) of the U-shaped element (16b) present box-shaped elements (26, 27) in which the two end portions (17) are configured to rotate and slide in order to pass from a configuration in which the cantilevered rods (22) match the raised portions (24) of the liner (14) to a configuration in which the U-shaped element (16b) is free to rotate towards its substantially vertical configuration.
5. Refrigerator door according to any of the preceding claims, wherein fastening means (28) are provided for maintaining the first element (16a) and the second element (16b) of the support in their vertical configuration.
6. Refrigerator door according to claim 5, wherein such fastening means (28) are supported by the first plate-shaped element (16a).

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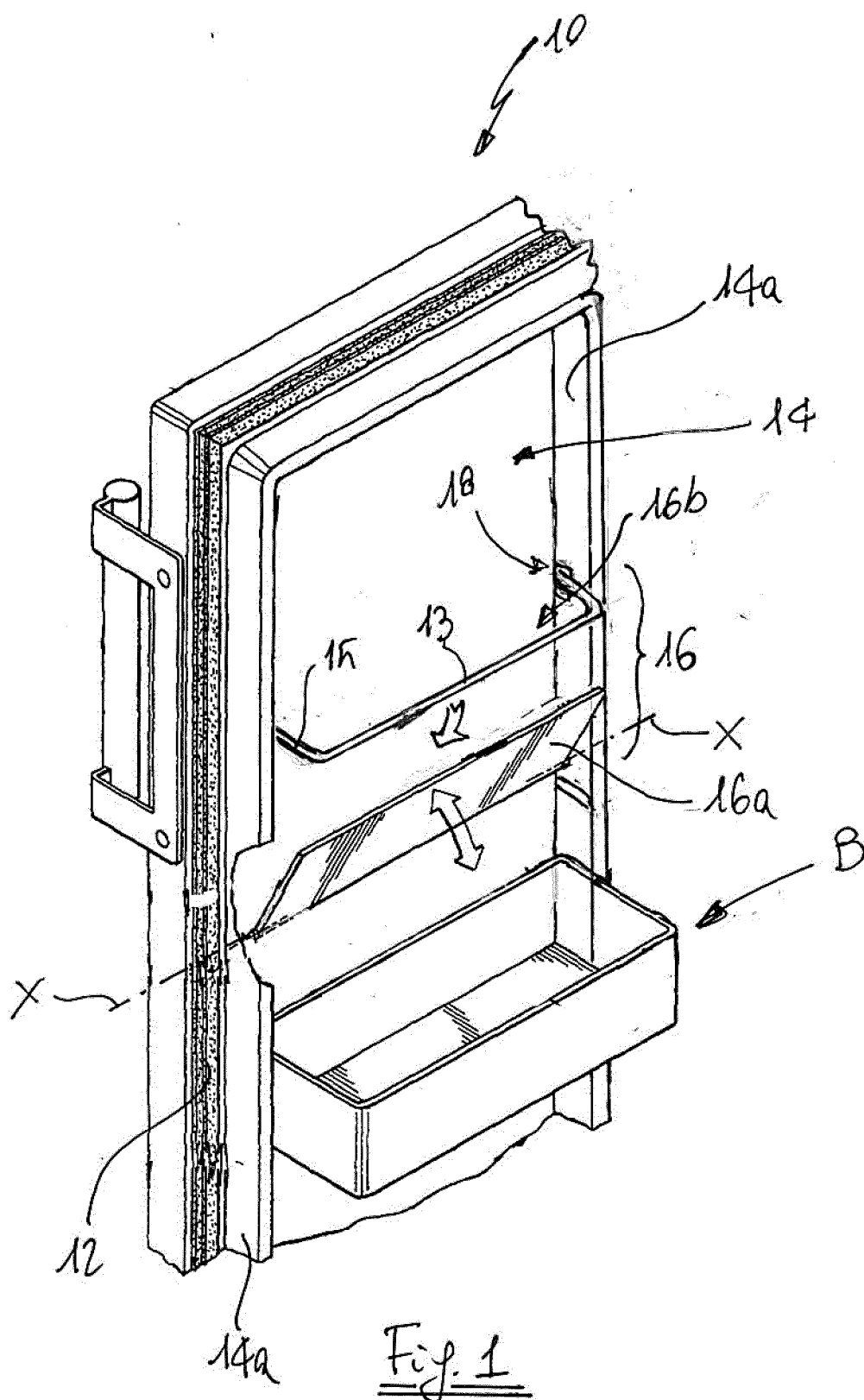
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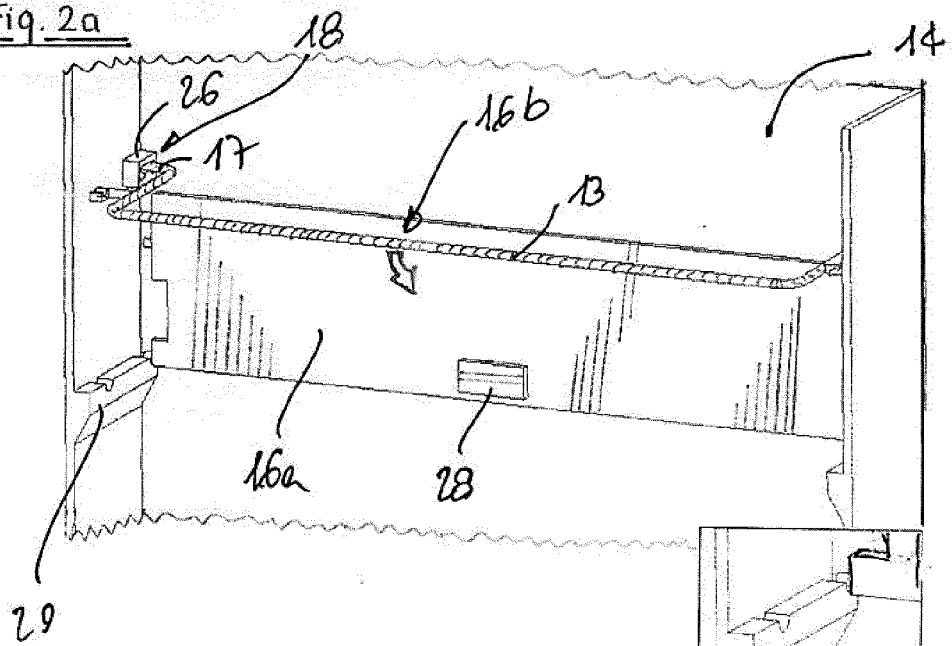
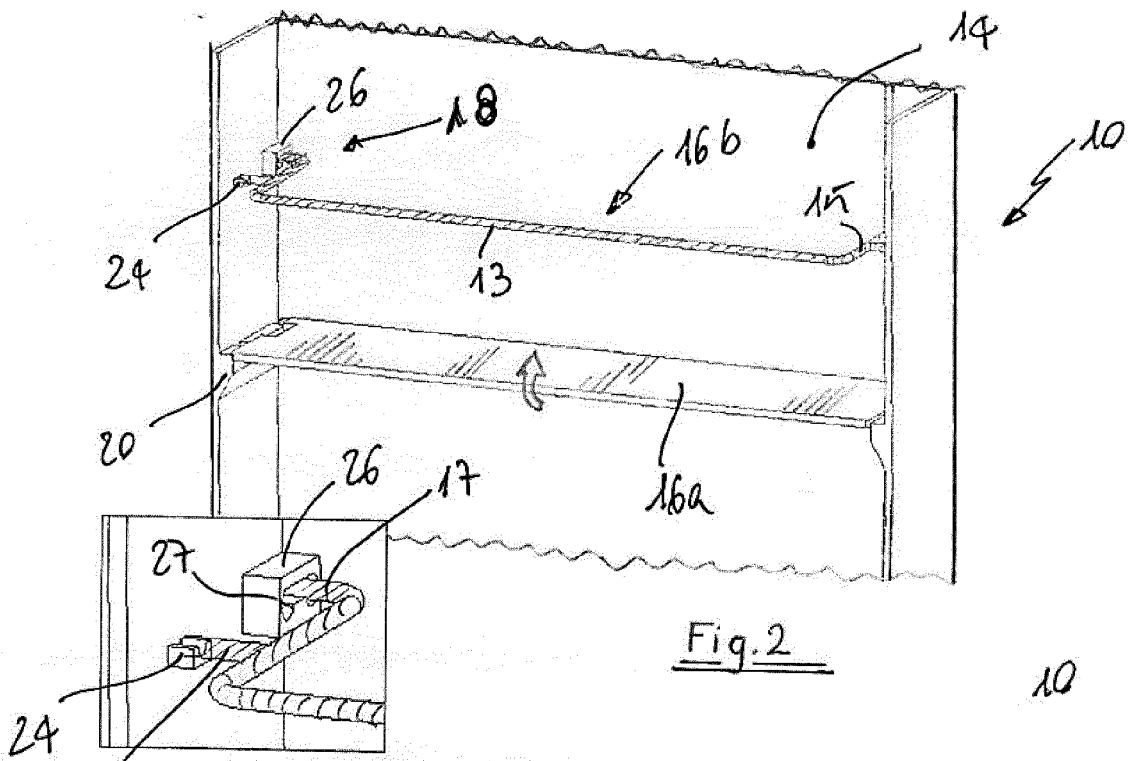
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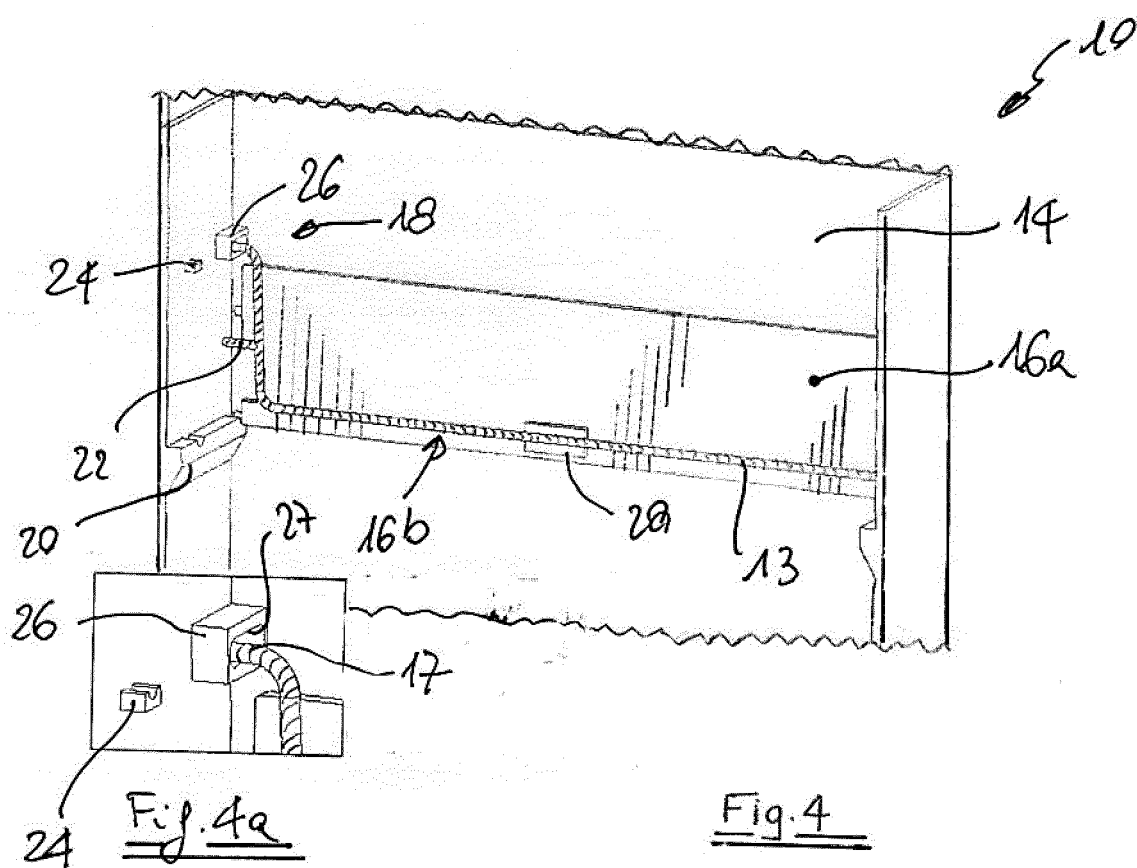
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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 7913

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			F25D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 August 2014	Examiner 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
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EP 14 17 7913

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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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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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- EP 937223 A [0002]