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(54) **Drawer for refrigerating apparatuses**

(57) The present invention relates to a drawer (1) for a refrigerating apparatus, comprising at least one bottom wall (7) and skirt walls (2,4,5,6) which can be positioned perpendicularly to said bottom wall (7), a grip handle (3) and at least two slide guides (8,9) for guiding said drawer

into a recess of said refrigerating apparatus during an insertion/extraction step, wherein said skirt walls (2,4,5,6) can be overturned relative to said bottom wall (7), and wherein said grip handle (3) and said slide guides (8,9) are provided in one piece with the respective skirt walls (2,5,6).

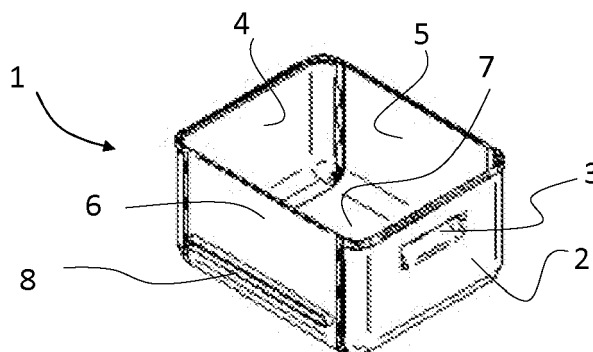


Fig. 1

Description

DESCRIPTION

[0001] The present invention relates to a drawer for a refrigerating apparatus, such as a refrigerator, a freezer or a refrigerator-freezer.

[0002] In particular, the drawer of the present invention is one of those suitable for storing fresh foods, e.g. vegetables, fruits or the like, within a refrigerated cell of a refrigerator.

[0003] Such drawers are normally located in the lower portion of the refrigerated cell, under a shelf secured to the cell walls and acting as a cover for the drawer itself.

[0004] These drawers are typically made of plastic, and their container part is manufactured as one piece by moulding the plastic material into suitable moulds.

[0005] A first drawback of this solution relates to the room taken by such drawers, the transportation of which requires adequate volumes.

[0006] This implies a second drawback, mainly due to the fact that the drawer has normally such shapes that the moulding process requires the use of moulds fitted with punches and movable parts (often referred to as "mould movements") in order to make, in one moulding step, also the undercuts present in the container part, which constitute, for example, handles, guides or the like.

[0007] The use of such moulds in the production process however involves the use of relatively complex moulding presses suitable for moving the various components of the mould. Moreover, compared to a traditional mould with no movable parts, this solution is more expensive and requires frequent maintenance and checks to avoid problems that would be reflected in the finished part.

[0008] If one wants to use simple moulds with no movable parts, one possible solution is to make first the container part of the drawer (i.e. the bottom wall with the side walls) and then mount to the container part all necessary details, e.g. handle or guides.

[0009] Although this solution solves the aforementioned problems, it is not optimal because requires additional assembly steps that are somewhat time-consuming.

[0010] The present invention aims at overcoming these and other drawbacks by providing a drawer for refrigerating apparatuses and a process for manufacturing such a drawer.

[0011] The present invention relates to a drawer for refrigerating apparatuses according to claim 1. Another object of the present invention is a household refrigerating apparatus comprising such a drawer according to one or more of the appended claims.

[0012] The idea at the basis of the present invention is to provide a drawer wherein the skirt walls thereof can be overturned relative to the bottom wall and a drawer grip handle is preferably made in one piece with one of said skirt walls.

[0013] According to an extremely advantageous feature, also the slide guides are made in one piece with the respective walls.

[0014] The fact that the skirt walls (i.e. the front wall, the back wall and the two side walls) can be overturned relative to the bottom wall allows for a simplified manufacturing process, because in this case the drawer parts to be moulded have no undercuts (so that moulds with no movable parts can be used) and it is not necessary to mount afterwards details such as guides and grip handle.

[0015] Further advantageous features will be set out in the appended claims.

[0016] These features as well as further advantages of the present invention will become apparent from the following description of an embodiment thereof as shown in the annexed drawings, which are supplied by way of non-limiting example, wherein:

Fig. 1 shows a perspective view of the drawer according to the present invention in the assembled condition;

Fig. 2 shows a front view of the drawer of Fig. 1;

Fig. 3 shows a side view of the drawer of Fig. 1;

Fig. 4 shows a plan view of the drawer of Fig. 1 in the non-assembled condition;

Fig. 5 shows a perspective view of the drawer of Fig. 4;

Fig. 6 shows a cross-section of a portion of the walls of the drawer of Fig. 1.

[0017] Referring now to Figs. 1, 2 and 3, there is shown a drawer 1 according to the present invention.

[0018] It comprises a bottom wall 7 and skirt walls 2, 4, 5 and 6 extending in a manner substantially perpendicular to the bottom wall 7 and connected thereto and to each other to form a parallelepipedon lacking the top wall, thus creating an access aperture leading to the inner volume of the drawer 1.

[0019] Between the skirt walls 2, 4, 5 and 6 there are a front wall 2 fitted with a grip handle 3, a back wall 4 facing the front wall 2, the two walls 2 and 4 being connected to two side walls 5 and 6 on which the guides 8 and 9 are provided as one piece, which allow the drawer 1 to slide within the refrigerated cell, thus guiding the insertion/extraction motion thereof into/from the recess of the refrigerated cell.

[0020] The bottom wall 7 extends horizontally and can therefore be moulded in an extremely simple and inexpensive manner.

[0021] The skirt walls 2, 4, 5 and 6 extend with no undercuts, so that they can be moulded without requiring the use of presses or moulds with moving parts, thus solving the problems suffered by the prior art.

[0022] In this way, all the walls, i.e. the bottom wall 7 as well as the skirt walls 2, 4, 5 and 6, are advantageously made as one piece and can be obtained in the same moulding step, so that the manufacturing process turns

out to be extremely economical and fast.

[0023] The front wall 2 comprises the handle 3 made as one piece, e.g. in the form of a recess obtained in the front wall 2 when moulding it.

[0024] The side walls 5 and 6 are made in one piece with the guides 9 and 8, which comprise each two parallel tabs jutting out from the respective wall in a direction substantially perpendicular to the latter.

[0025] Of course, it must be pointed out right away that different shapes of the handle 3 and guides 8 and 9 should be considered to be equivalent to those just described.

[0026] In addition to handles and guides, it is also possible to provide on the walls 2,4,5,6, without making any undercuts, holes adapted to enhance the air circulation inside and outside the drawer 1. Such holes also ensure that the foodstuffs stored in the drawer 1 are preserved at the proper temperature.

[0027] As can be seen in Figs. 4 and 5, the drawer 1 is subdivided into the various walls 2, 4, 5, 6 and 7, which can be turned upwards for the purpose of switching from the non-assembled configuration of Figs. 4 and 5 to the assembled configuration of Figs. 1, 2 e 3.

[0028] More specifically, each skirt wall 2, 4, 5 and 6 can be bent with respect to the bottom wall 7 along one of its edges, so as to be overturned relative to the latter from a first position in which it lies substantially in the same plane (as in Figs. 4 and 5) to a second position in which it is perpendicular thereto (as in Figs. 1, 2 and 3).

[0029] To this end, hinge edges 27, 47, 57 and 67 are provided which extend along the bottom wall 7 and, respectively, the front wall 2, the back wall 4 and the side walls 5 and 6.

[0030] The hinge edges are advantageously obtained simply by reducing the section thickness at the bend, as shown in the sectional view of Fig. 6 that illustrates the hinge edge 47 between the wall 4 and the bottom 7.

[0031] Furthermore, in order to facilitate the assembly, the edges of the skirt walls include fixing joints which advantageously eliminate the need to prearrange connection means such as screws, bolts, metal clips or the like, thus ensuring an extremely simple installation.

[0032] The fixing joints comprise a plurality of engaging teeth 51, 61 and respective seats 21, 41 adapted to house the engaging teeth 51, 61 through mutual interference fit.

[0033] More in detail, with reference to Fig. 5, it can be noted that the side walls 5 and 6 comprise engaging teeth 51, 61 that jut out from the free edge of the respective wall 5, 6 and extend substantially in the same plane as the latter, thus being coplanate thereto.

[0034] The seats 21, 41 are provided on the edges of the front wall 2 and of the back wall 4, so that a user wanting to assemble the drawer 1 starting from the situation of Fig. 4 will first have to rotate (by bending them) the two side walls 5 and 6 to bring them perpendicular to the bottom wall 7 and then rotate (by bending them) the front wall 2 and the back wall 7 to bring them also perpendicular to the bottom 7 and thus fit by interference

the engaging teeth 51, 61 into the respective seats 21, 41.

[0035] This extreme simplicity of assembly also brings about a further advantage inherent to the fact that it is possible to transport a large number of drawers 1 without these taking up much space: in fact, it is sufficient to transport the drawers 1 piled up in the non-assembled condition (as shown in Figs. 4 and 5), which may then be assembled only when necessary; this process, as described above, is so simple and fast that it may even be left up to the final user, who will need no special technical skills or tools.

[0036] Referring now more in detail to Fig. 5, there is shown an extremely advantageous feature of the drawer 1 according to the present invention.

[0037] For the purpose of avoiding the presence of sharp edges, in fact, the latter have a rounded shape that makes them stronger and less dangerous in the event of an impact.

[0038] To this end, the side walls 5 and 6, the front wall 2 and the back wall 4 have the lower edge, i.e. the one hinged to the bottom wall 7, bent by approximately 90°, so that the edge between them and the bottom 7 becomes round.

[0039] In order to make round those edges which when the drawer 1 is in the assembled condition (as in Fig. 1) are vertical, the front wall 2 and the back wall 4 have their side edges (i.e. those facing the side walls 5 and 6) bent by approximately 90°.

[0040] This provides two advantages: firstly, the vertical edges become round, and secondly, the seats 21 and 41 provided on said edges become stronger and allow the engaging teeth 51 and 61 to be made coplanate to the respective walls 5 and 6, resulting in greater structural strength.

[0041] Many changes may of course be made in the light of the teachings provided herein, which changes will nonetheless fall within the scope of the present invention.

[0042] The material of the drawer 1 is preferably a material characterised by sufficient elasticity to allow the side walls to be bent with respect to the bottom wall while at the same time ensuring sufficient strength to avoid any damage during the bending step; said material may be, for example, polypropylene or even polyethylene.

[0043] For example, the rounded side edges may be provided only on the side walls 5, 6 and be absent on the front wall 2 and back wall 4.

[0044] Likewise, it is conceivable that the positions of the seats 21, 41 and those of the engaging teeth 51, 61 are reversed, the former being provided on the side walls 5 and 6 and the latter being provided on the front wall 2 and back wall 4; in such a case, the bending of the side walls will take place following the bending of the front and back walls.

Claims

1. Drawer (1) for a refrigerating apparatus, comprising

at least one bottom wall (7) and skirt walls (2,4,5,6) which can be positioned perpendicularly to said bottom wall (7), and a grip handle (3),

characterised in that

said skirt walls (2,4,5,6) can be overturned relative to said bottom wall (7), and wherein said grip handle (3) is provided in one piece with at least one of the skirt walls (2,5,6).

2. Drawer (1) according to claim 1, further comprising at least two slide guides (8,9) associated with as many skirt walls for guiding said drawer into a recess of said refrigerating apparatus during an insertion/extraction step, said slide guides (8,9) being provided in one piece with the respective skirt walls. 10
3. Drawer (1) according to claim 1 or 2, wherein the skirt walls (2,4,5,6) and the bottom wall (7) are manufactured as one piece. 20
4. Drawer (1) according to claim 1 or 2 or 3, wherein said bottom wall (7) and said skirt walls (2,4,5,6) have no undercuts.
5. Drawer (1) according to any of the of the preceding claims, wherein said skirt walls (2,4,5,6) comprise a front wall (2) which incorporates said handle (3) in the form of a recess obtained in said front wall (2). 25
6. Drawer (1) according to any one of the preceding claims, wherein said skirt walls (2,4,5,6) comprise two side walls (5,6) incorporating said guides (9,8), which jut out from the respective wall in a direction substantially perpendicular thereto. 30
7. Drawer (1) according to one or more of the preceding claims, wherein said skirt walls (2,4,5,6) can be turned about hinge edges (27,47,57,67) relative to said bottom wall (7), so as to switch from a first configuration in which they are coplanate to the latter to a second configuration in which they are perpendicular thereto. 35
8. Drawer (1) according to one or more of the preceding claims, wherein said hinge edges (27,47,57,67) are obtained through a reduction in thickness of the respective wall. 40
9. Drawer (1) according to one or more of the preceding claims, wherein said skirt walls (2,4,5,6) include fixing joints (21,41,51,61) for mutually securing said skirt walls (2,4,5,6), and wherein said fixing joints comprise a plurality of engaging teeth (51,61) and of respective seats (21,41) adapted to house said engaging teeth (51,61) through mutual interference fit, said engaging teeth (51,61) jutting out from the free edges of two side walls (5,6) and being coplanate to the respective side walls (5,6). 45

10. Drawer (1) according to one or more of the preceding claims, wherein said skirt walls (2,4,5,6) have the edge hinged to the bottom wall (7) and bent by approximately 90°, and wherein the side edges of said front wall (2) and back wall (4) are bent by approximately 90°.

11. Drawer (1) according to one or more of the preceding claims, comprising one or more holes provided in said skirt walls (2,4,5,6) and/or in said bottom wall (7).

12. Household refrigerating apparatus comprising a drawer (1) according to one or more of the preceding claims.

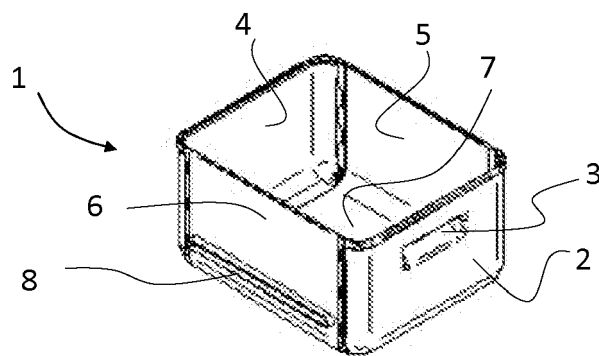


Fig. 1

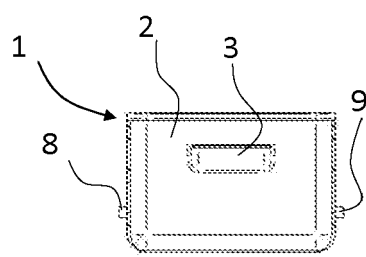


Fig. 2

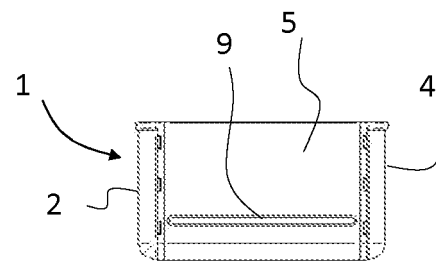
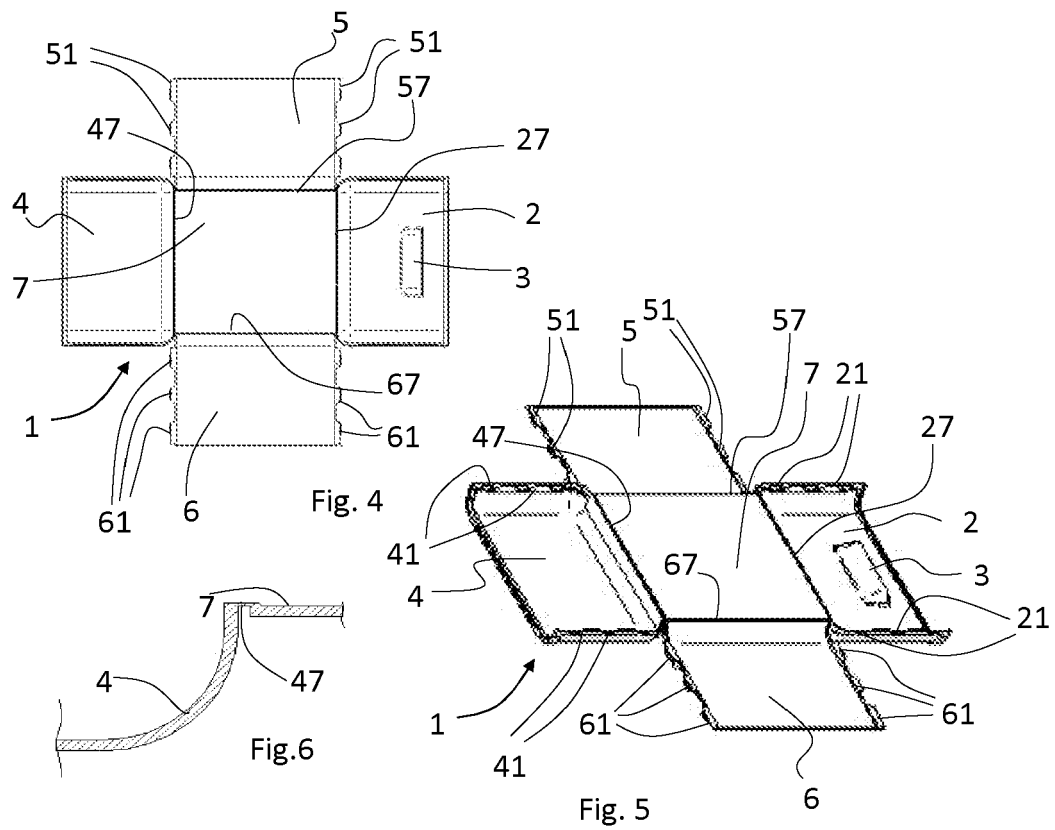


Fig. 3





EUROPEAN SEARCH REPORT

Application Number
EP 11 15 4573

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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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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 June 2011	Examiner Léandre, Arnaud
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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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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