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(54) **REFRIGERATOR WITH GLASS SHELVES**

KÜHLSCHRANK MIT GLASREGALEN

RÉFRIGÉRATEUR AVEC ÉTAGÈRES EN VERRE

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Description

[0001] The present invention relates to a refrigerator, in particular a domestic refrigerator, having an internal compartment with side walls, each side wall being provided with molded parts for supporting at least one glass shelf.

[0002] A refrigerator of the above kind is disclosed by EP 2606295 where the molded parts are grooves of the inner liner adapted to cooperate with support rails on which the shelf can slide.

[0003] Documents WO2005009173, US9259088, DE202004017136U and DE102011087785 disclose refrigerators with glass shelves.

[0004] Such construction is quite complex since need at least three element on each side of the shelf, i.e. the groove, the support rail and a shaped rail fixed to the shelf. Moreover this solution is mainly focused on sliding shelves and not sliding drawers.

[0005] In the modern refrigerators there is the trend of allowing the user to arrange the inner part of the refrigerator depending on his will. So he can decide to have simple glass shelves or sliding drawers in the refrigerator cavity.

[0006] The present invention is disclosed in the independent claim 1. Further embodiments are disclosed in the dependent claims.

[0007] Object of the present invention is to provide a refrigerator in which the user can easily pass from a cavity with shelves only to a cavity with shelves and drawers.

[0008] In particular, the present invention avoids the lateral wobbling of the drawer and its vertical movement. In this way, during the use of the drawer, the customers feel a precise extraction of the drawer, similar to the use of metal telescopic rails.

[0009] The basic concept of the present invention consists of two plastic elements inserted at the glass shelf sides.

[0010] In the upper part of the plastic elements, some protrusions allow to block the sliding movement of the glass shelf.

[0011] According to another feature, lateral parts of the plastic elements allow keeping the glass shelf in the center of the compartment or cell.

[0012] According to another feature, in the front part of each shelf, two elastic ribs with pins block the glass shelf on the cell, avoiding its movement during food items handling or during pull out of the drawer. In addition, they compensate the unavoidable deformation of the cabinet.

[0013] Plastic elements are made of Polyoxymethylene (POM) to allow a better sliding of the drawer. In an alternative solution, plastic elements may be made of cheaper plastic material (for instance I Polypropylene (PP)) with co-molded shaped protrusion of Polyoxymethylene (POM) on which the drawer can slide.

[0014] Further advantages and features of the present invention will be clear from the detailed description of one embodiment thereof, with reference to the attached drawings in which:

- Figure 1 is a perspective view of a portion of a shelf according to the invention immediately before its mounting on the side walls of the refrigerator compartment;
- Figure 2 is a perspective view of a portion of the shelf mounted on the side walls of the compartment;
- Figure 3 is a partially sectioned view of what is shown in figure 2;
- Figure 4 is a perspective view of a sliding drawer mounted on the shelf, where the side walls of the compartment have been removed for sake of clarity;
- Figure 5 is an enlarged view of a detail of figure 4,
- Figure 6 is a detail of a shelf viewed from the bottom thereof, and
- Figure 7 is a perspective view of a component according to the invention.

[0015] With reference to the drawings, a refrigerator R comprises an inner cavity C where a plurality of glass shelves G is mounted. Each shelf G is provided, on parallel sides, with plastic elements 10 having a C-shaped cross section mounted on edge 12 of the shelf G. Each plastic element 10 may have a continuous C-shaped portion 11a (as shown in figure 7) or it can have a C-shaped slotted portion 11b (as shown in figure 6), both C-shaped portions 11a, 11b (continuous or slotted) having the same purpose for mounting the plastic element 10 on the shelf.

[0016] The inner walls W of the compartment C present two molded parts 14 and 17 which may be obtained by thermoforming the plastic inner liner, or by using components obtained by injection molding and inserted in aperture of the liner in a foam tightly manner. With the term molded parts we mean the above solutions, and any alternative solution as well.

[0017] The front molded part 14 comprises a blind hole 14a for receiving a pin 16a of an elastic portion 16 of the plastic element 10 which protrudes laterally and in the front portion thereof. The detail of the mounted configuration is shown in figures 2 and 3, where the pin 16a is elastically inserted in the blind hole 14a.

[0018] The front portion of the plastic element 10 present a cross part 10a which avoids any sliding of the glass shelf G toward the outside, while any backward movement of the shelf G is prevented by a similar cross part 10b present in the rear portion of the plastic element 10 (figure 5) or by the rear wall of the compartment.

[0019] On the upper side of each plastic element 10, with reference to the installed configuration of the element, there are two series of protrusion 18 and 20. The first series of protrusions are simple linear protrusions on which a bottom wall of a plastic drawer 22 can slide. The protrusions of the second series are hook-shaped and are configured to cooperate with side rails 24 of the bottom of the drawer 22 for avoiding any tilting movement thereof. Moreover, each plastic element 10 is provided with a protrusion 26 on the front part of the element which

is shaped so as to guide the drawer 22 and its side rails 24 in the initial mounting sliding movement of the drawer itself.

[0020] Each plastic element 10 is also provided with a side elastic tongue 28 which keeps the glass shelf G in the center of the compartment.

[0021] From the above description it is clear how the mounting of the glass shelf G in the inner compartment C is simple and safe, since the plastic element 10 are coupled with two opposite side of the glass plate, and then the glass shelf G (including the glass plate and the plastic element 10) is inserted elastically in the molded parts. If the user wants to install a sliding drawer 22 in the space defined by two glass shelves G, he has to simply insert the drawer on the glass shelf and in this coupling movement he is helped by the shaped protrusion 26.

[0022] For avoiding the tilting movement when the drawer reaches its fully opened configuration, the drawer 22 presents lateral protrusion 30 configured to cooperate with corresponding protrusion (not shown) of the inner liner.

[0023] The series of protrusion 18 and 20, where the drawer 22 slides on, may be of a plastic co-molded material different from the material of the plastic element and having a lower friction coefficient; this may reduce the overall cost of the plastic elements 10.

Claims

1. Refrigerator (R), in particular domestic refrigerator, having an internal compartment (C) with side walls (W), each wall (W) being provided with molded parts (14, 17) for supporting a glass shelf (G) of the refrigerator (R), wherein two parallel sides of the glass shelf (G) are provided with plastic elements (10) having a C-shaped cross-section for embedding, at least partially, the respective edges (12) of the glass shelf, each plastic element (10) being provided with a first elastic portion (16) configured to cooperate with a corresponding seat (14a) of a molded part (14),
wherein each plastic element (10) comprises on an upper side thereof first series of linear protrusions (18) configured to slidably receive a bottom wall of a plastic drawer (22) of the refrigerator (R), **characterized in that** each plastic element (10) comprises on an upper side thereof second series of protrusions (20), said second series of protrusions (20) being hook-shaped and configured cooperate with side rails (24) of the bottom wall of a plastic drawer (22).

2. Refrigerator (R) according to claim 1, wherein each plastic element (10) is provided with a second elastic portion (28) cooperating with the respective side wall (W) for maintaining the glass shelf (G) centered within the internal compartment (C).

3. Refrigerator (R) according to any of the preceding claims, wherein for each side wall (W) and each glass shelf (G) the molded parts comprises a rear portion (17) and a front portion (14), the first elastic portion (16) being configured to cooperate with the first molded part (14, 14a).

4. Refrigerator (R) according to claim 3, wherein the first elastic portion (16) is a part of the plastic element (10) protruding laterally therefrom and configured to cooperate with a lowered seat (14a) of the front molded part (14).

5. Refrigerator (R) according to claim 4, wherein the second elastic portion (28) of the plastic element (10) is an elastic tongue protruding laterally therefrom in a direction substantially opposite to the first elastic portion (16).

6. Refrigerator (R) according to claim 1, wherein the plastic elements (10) are made of Polyoxymethylene (POM).

7. Refrigerator (R) according to claim 1, wherein the plastic elements (10) are made of a material cheaper than Polyoxymethylene (POM) with co-molded shaped protrusions (18, 20) made of Polyoxymethylene (POM).

Patentansprüche

1. Kühlschrank (R), insbesondere ein Haushaltskühlschrank, der ein Innenfach (C) mit Seitenwänden (W) aufweist, wobei jede Wand (W) mit Formteilen (14, 17) zum Tragen einer Glasplatte (G) des Kühlschranks (R) bereitgestellt ist, wobei zwei parallele Seiten des Glasregals (G) mit Kunststoffelementen (10) bereitgestellt sind, die einen C-förmigen Querschnitt zum zumindest teilweisen Einbetten der jeweiligen Kanten (12) des Glasregals aufweisen, wobei jedes Kunststoffelement (10) mit einem ersten elastischen Abschnitt (16) bereitgestellt ist, der so konfiguriert ist, dass er mit einem entsprechenden Sitz (14a) eines Formteils (14) zusammenwirkt,
wobei jedes Kunststoffelement (10) auf einer Oberseite davon eine erste Reihe von linearen Vorsprüngen (18) umfasst, die so konfiguriert sind, dass sie eine Bodenwand einer Kunststoffschublade (22) des Kühlschranks (R) gleitend aufnehmen, **dadurch gekennzeichnet, dass** jedes Kunststoffelement (10) auf einer Oberseite davon eine zweite Reihe von Vorsprüngen (20) umfasst, wobei die zweite Reihe von Vorsprüngen (20) hakenförmig ist und so konfiguriert ist, dass sie mit Seitenschienen (24) der Bodenwand einer Kunststoffschublade (22) zusammenwirkt.

2. Kühlschrank (R) nach Anspruch 1, wobei jedes Kunststoffelement (10) mit einem zweiten elastischen Abschnitt (28) bereitgestellt ist, der mit der jeweiligen Seitenwand (W) zusammenwirkt, um den Glasboden (G) in der Mitte des Innenfachs (C) zu halten.

3. Kühlschrank (R) nach einem der vorstehenden Ansprüche, wobei die Formteile für jede Seitenwand (W) und jeden Glasboden (G) einen hinteren Abschnitt (17) und einen vorderen Abschnitt (14) umfassen, wobei der erste elastische Abschnitt (16) so konfiguriert ist, dass er mit dem ersten Formteil (14, 14a) zusammenwirkt.

4. Kühlschrank (R) nach Anspruch 3, wobei der erste elastische Abschnitt (16) ein Teil des Kunststoffelements (10) ist, der seitlich davon vorsteht und so konfiguriert ist, dass er mit einem abgesenkten Sitz (14a) des vorderen Formteils (14) zusammenwirkt.

5. Kühlschrank (R) nach Anspruch 4, wobei der zweite elastische Abschnitt (28) des Kunststoffelements (10) eine elastische Zunge ist, die seitlich davon in einer Richtung im Wesentlichen entgegengesetzt zum ersten elastischen Abschnitt (16) vorsteht.

6. Kühlschrank (R) nach Anspruch 1, wobei die Kunststoffelemente (10) aus Polyoxymethylen (POM) hergestellt sind.

7. Kühlschrank (R) nach Anspruch 1, wobei die Kunststoffelemente (10) aus einem Material hergestellt sind, das billiger als Polyoxymethylen (POM) ist, mit gemeinsam geformten Vorsprüngen (18, 20), die aus Polyoxymethylen (POM) hergestellt sind.

Revendications

1. Réfrigérateur (R), en particulier un réfrigérateur domestique, présentant un compartiment interne (C) avec des parois latérales (W), chaque paroi (W) étant pourvue de pièces moulées (14, 17) pour supporter une étagère en verre (G) du réfrigérateur (R), dans lequel deux côtés parallèles de l'étagère en verre (G) sont pourvus d'éléments en plastique (10) présentant une coupe transversale en forme de C pour intégrer, au moins partiellement, les bords respectifs (12) de l'étagère en verre, chaque élément en plastique (10) étant pourvu d'une première portion élastique (16) configurée pour coopérer avec un siège correspondant (14a) d'une pièce moulée (14), dans lequel chaque élément en plastique (10) comprend, sur un côté supérieur de celui-ci, une première série de saillies linéaires (18) configurées pour recevoir, de manière à pouvoir coulisser, une paroi inférieure d'un tiroir en plastique (22) du réfrigérateur (R), **caractérisé en ce que** chaque élément en plastique (10) comprend, sur un côté supérieur de celui-ci, une seconde série de saillies (20), ladite seconde série de saillies (20) étant en forme de crochet et configurée pour coopérer avec des rails latéraux (24) de la paroi inférieure d'un tiroir en plastique (22).

2. Réfrigérateur (R) selon la revendication 1, dans lequel chaque élément en plastique (10) est pourvu d'une seconde portion en plastique (28) coopérant avec la paroi latérale (W) respective pour maintenir l'étagère en verre (G) centrée à l'intérieur du compartiment interne (C).

3. Réfrigérateur (R) selon l'une quelconque des revendications précédentes, dans lequel, pour chaque paroi latérale (W) et chaque étagère en verre (G), les parties moulées comprennent une portion arrière (17) et une portion avant (14), la première portion élastique (16) étant configurée pour coopérer avec la première partie moulée (14, 14a).

4. Réfrigérateur (R) selon la revendication 3, dans lequel la première portion élastique (16) est une partie de l'élément en plastique (10) saillante latéralement depuis celui-ci et configurée pour coopérer avec un siège abaissé (14a) de la partie moulée avant (14).

5. Réfrigérateur (R) selon la revendication 4, dans lequel la seconde portion élastique (28) de l'élément en plastique (10) est une languette élastique saillante latéralement depuis celui-ci dans une direction sensiblement opposée à la première portion élastique (16).

6. Réfrigérateur (R) selon la revendication 1, dans lequel les éléments en plastique (10) sont constitués de polyoxyméthylène (POM).

7. Réfrigérateur (R) selon la revendication 1, dans lequel les éléments en plastique (10) sont constitués d'un matériau moins cher que le polyoxyméthylène (POM) avec des saillies façonnées co-moulées (18, 20) constituées de polyoxyméthylène (POM).

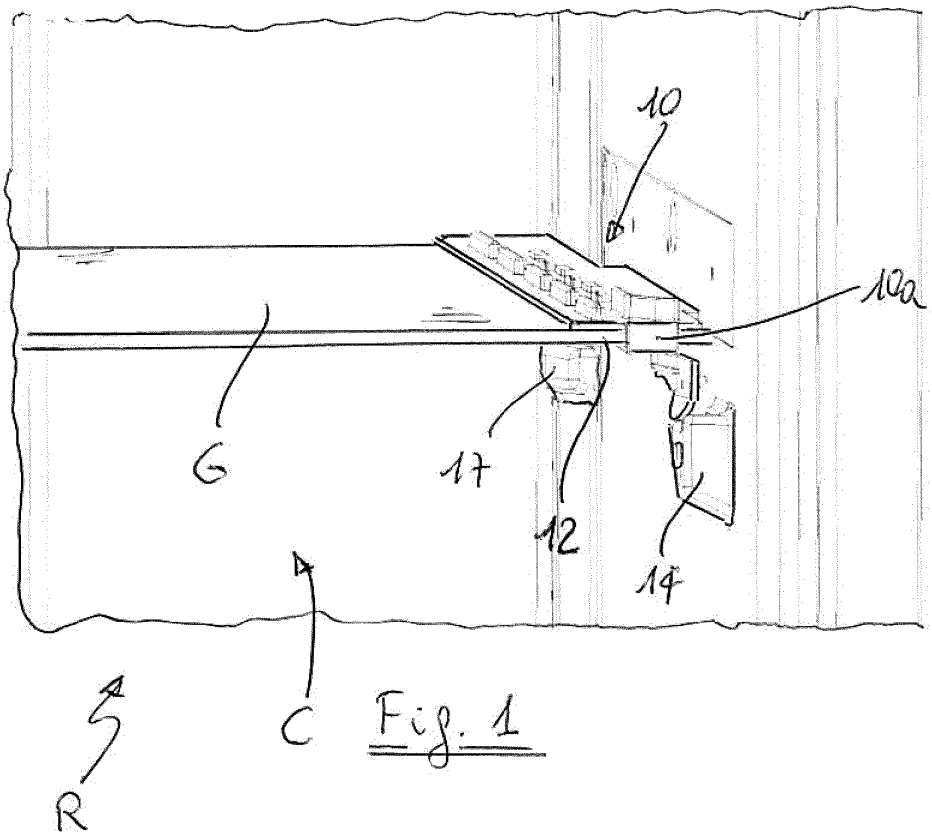

Fig. 1

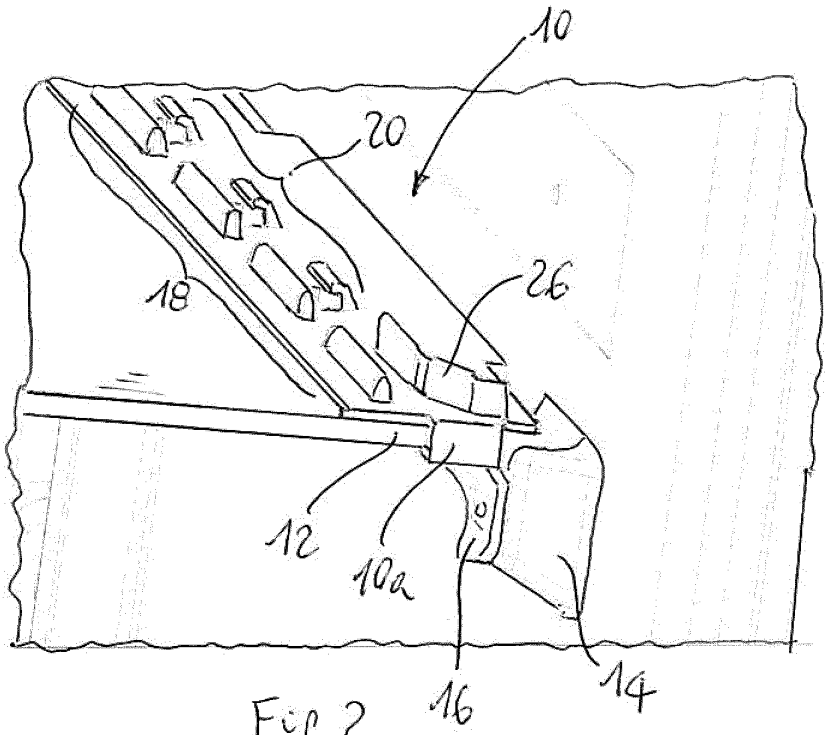

Fig. 2

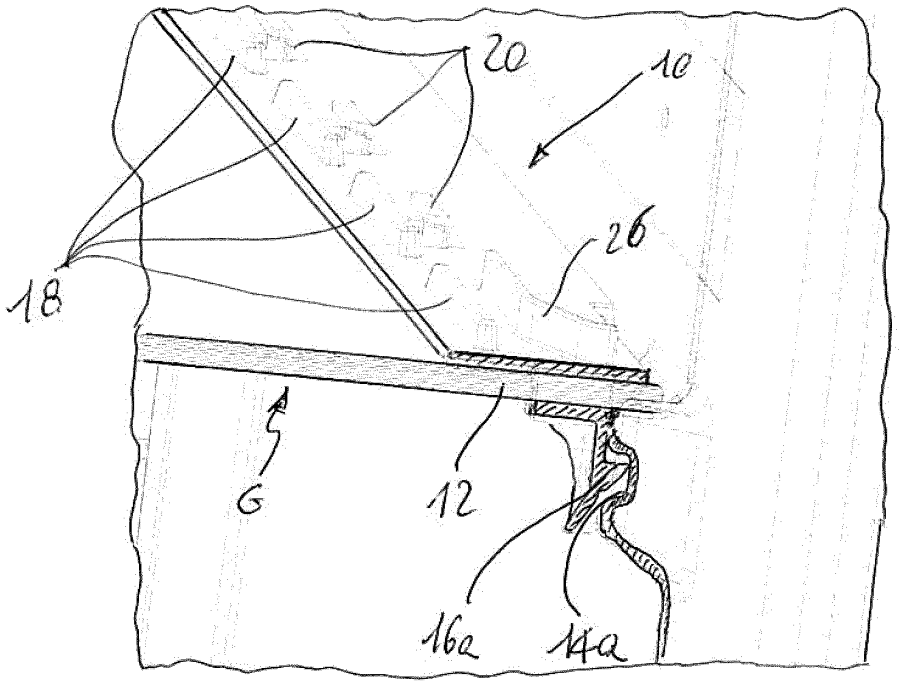

Fig. 3

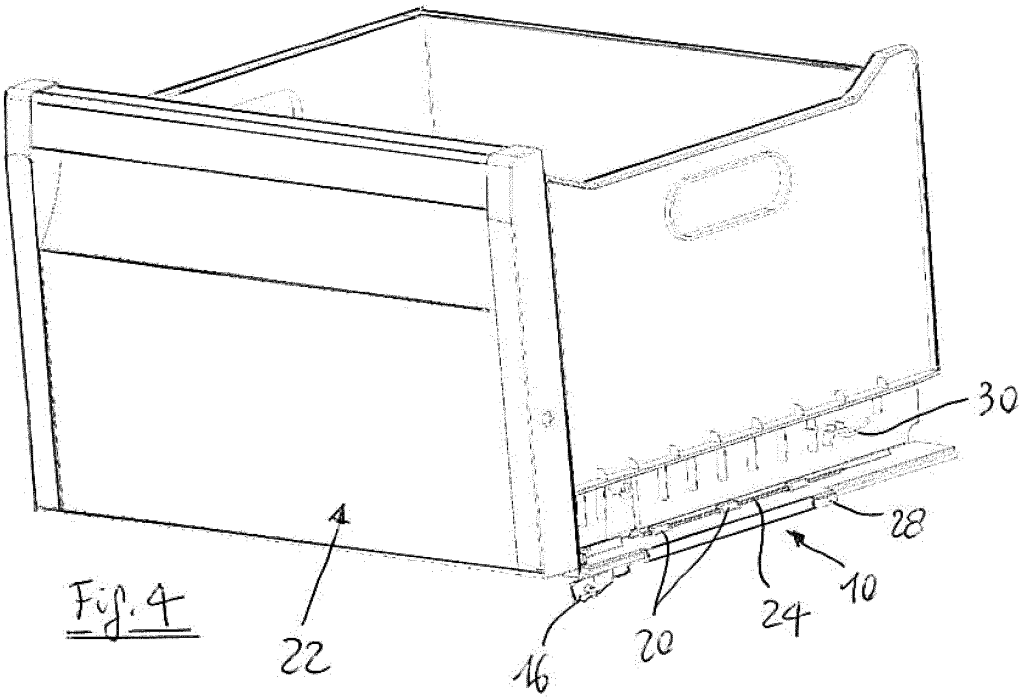

Fig. 4

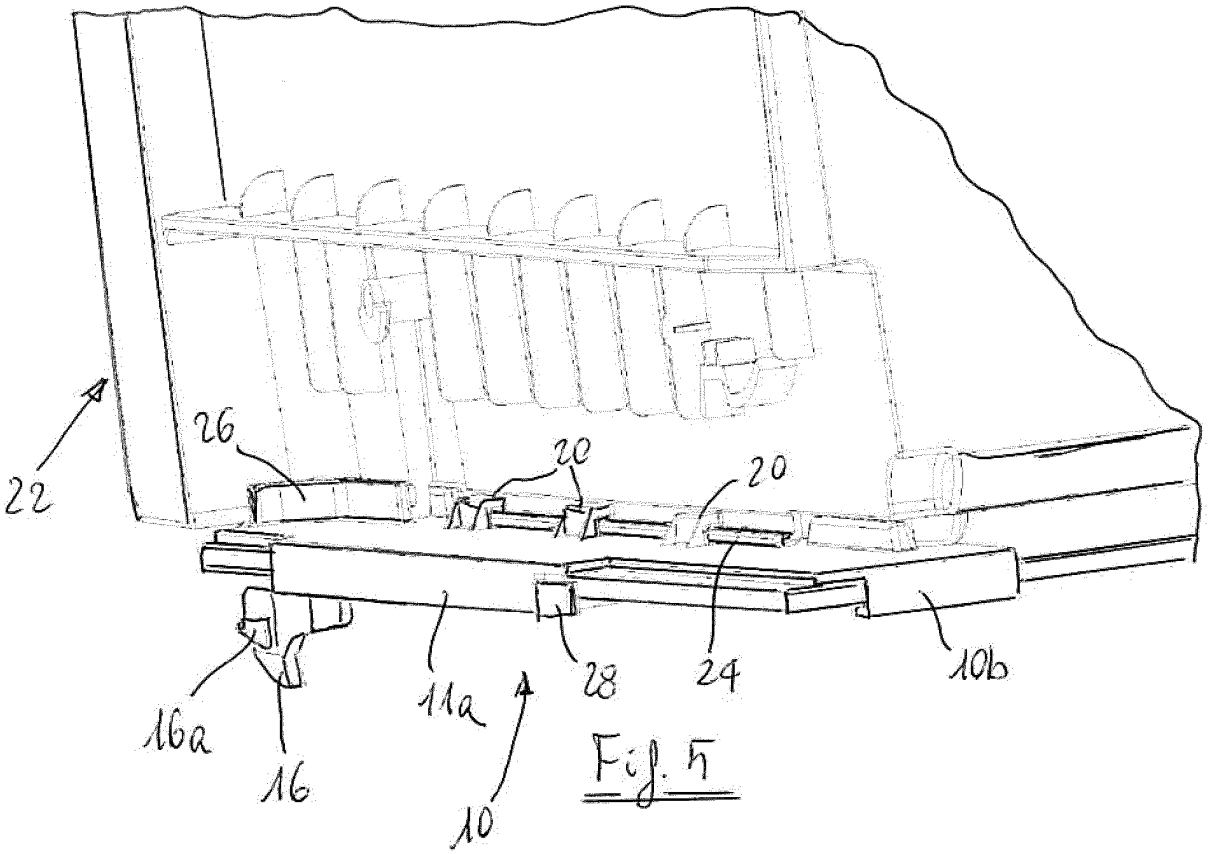

Fig. 5

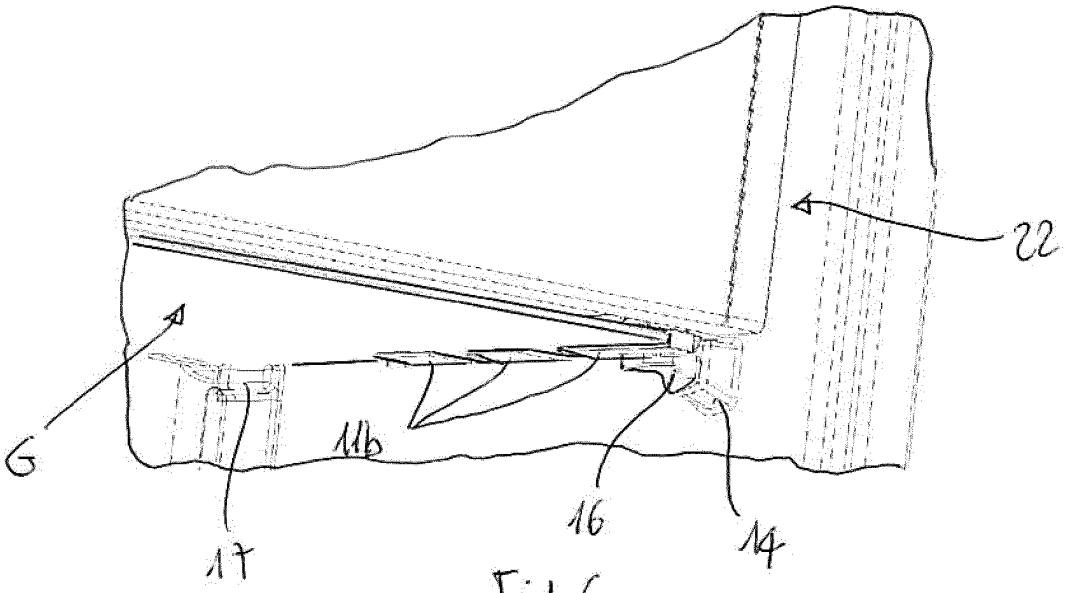

Fig. 6

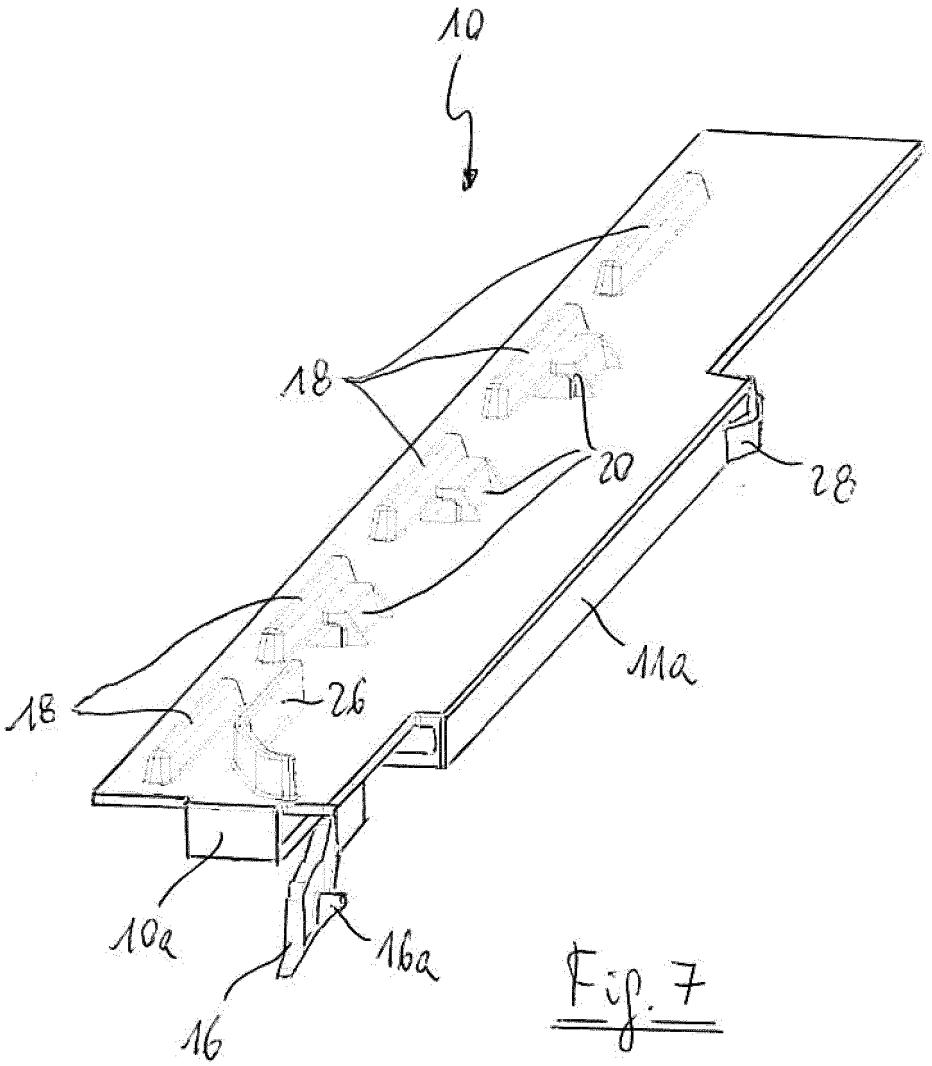

Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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