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(54) **Cooling appliance**

(57) Cooling appliance with a structure comprising a packing device (2) suitable for vacuum packing products contained in flexible bags. Said packing device (2) comprises packing means (3) that comprise a vacuum chamber in which is disposed an open end of a flexible bag, suction means for extracting air from said vacuum chamber, and sealing means for closing said flexible bag along a line beyond the vacuum chamber. The packing device (2) is housed inside the structure of the refrigerator (1) when it is not being used, and is slidably extractable for its use.

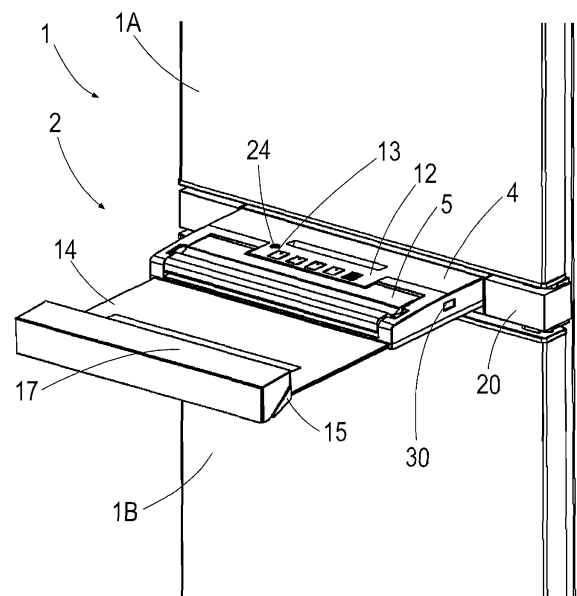


Fig. 1

Description

TECHNICAL FIELD

[0001] The invention refers to cooling appliances and in particular to cooling appliances that comprise a packing device suitable for vacuum packing products contained in flexible bags, in particular in plastic bags.

PRIOR ART

[0002] There are known packing devices suitable for vacuum packing products contained in flexible bags that are designed as a separate accessory. Said packing devices include packing means that comprise a vacuum chamber in which an open end of a flexible bag is disposed, suction means for extracting air from said vacuum chamber, and sealing means for closing said flexible bag along a line beyond the vacuum chamber. US 6,694,710 B2 and EP 0723915 B1 disclose embodiments of vacuum packing devices of this type.

[0003] It is possible to build a packing device suitable for vacuum packing products contained in flexible bags into cooling appliances such as refrigerators, freezers or combinations of both. US 7,331,163 B2 discloses a refrigerator that comprises a packing device of this type. Said packing device is housed in a recess disposed vertically in one of the doors of the refrigerator. The refrigerator also comprises a pivoting door for covering the packing device. Said packing device can be used while being housed in its recess or by removing it from said recess and using it as a separate accessory.

DISCLOSURE OF THE INVENTION

[0004] It is the object of this invention to provide a cooling appliance with a vacuum packing device as defined in the claims.

[0005] The cooling appliance of the invention comprises a structure that comprises a vacuum packing device. Said packing device is suitable for vacuum packing products contained in flexible bags and comprises packing means that include:

- a vacuum chamber in which is disposed an open end of a flexible bag,
- suction means for extracting air from said vacuum chamber, and
- sealing means for closing said flexible bag along a line beyond the vacuum chamber.

[0006] The packing device of the cooling appliance of the invention is housed inside the structure of said cooling appliance when it is not being used, and is slidably extractable for its use. As a result, when the packing device does not need to be used, neither the packing device nor any door or similar member covering said packing device are visible. In addition, the fact that the packing device

may be slid out allows said packing device to be disposed in an optimal position for its use without the need to detach the packing device from the cooling appliance.

[0007] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

10 **[0008]**

Figure 1 shows a partial view in perspective of an embodiment of the cooling appliance of the invention, with the packing device being extracted from the inside of the structure of the cooling appliance ready for its use.

Figure 2 shows a partial view in perspective of the embodiment of Figure 1 with the cover of the packing means of the packing device being open.

Figure 3 shows a view in perspective of the main body of the packing means of the packing device of the cooling appliance of Figure 1.

Figure 4 shows the base that is housed in the main body of Figure 3.

Figure 5 shows the box in which the packing device of the cooling appliance of the embodiment of Figure 1 is housed.

Figure 6 shows the central base of the embodiment of Figure 1.

Figure 7 shows a partial view in perspective of the embodiment of Figure 1 in which the roll-holder housing is shown.

Figure 8 shows a view in perspective of the packing device of the embodiment of Figure 1, said packing device being in a first position.

Figure 9 shows a view in perspective of the packing device of the embodiment of Figure 1, said packing device being in a second position.

DETAILED DISCLOSURE OF THE INVENTION

[0009] Figures 1 and 2 partially show the structure of a domestic cooling appliance 1 according to the invention. Said cooling appliance 1 includes a vacuum packing device 2 that is suitable for vacuum packing products contained in flexible bags, in particular in plastic bags.

[0010] The packing device 2 comprises packing means 3 that comprise:

- a vacuum chamber in which is disposed an open end

of a flexible bag,

- suction means (not shown in the figures) for extracting air from said vacuum chamber, and
- sealing means for closing said flexible bag along a line beyond the vacuum chamber.

[0011] In this embodiment the packing device 2 also comprises an air intake 24 connected to the suction means. Said air intake 24 is suitable for the connection of one end of a vacuum tube (not shown in the figures) to create a vacuum in containers such as pots and jars.

[0012] The packing device 2 is housed inside the structure of the cooling appliance 1 when it is not being used, with the result that it is not visible. As a result it is possible to ensure that the cooling appliance 1 does not differ in appearance from cooling appliances that do not feature a packing device. The packing device 2 is slidably extractable for its use, moving from its hidden position to the position shown in figures 1, 2 and 7.

[0013] As can be deduced from the aforementioned figures 1, 2 and 7, in this embodiment the packing device 2 is housed inside the structure of the cooling appliance 1 in a substantially horizontal position and is extractable by means of a linear movement of said packing device 2.

[0014] In the embodiment shown in the figures, the cooling appliance 1 of the invention comprises an upper compartment 1A and a lower compartment 1B, one of said compartments being a refrigerator compartment and the other compartment being a freezer compartment, and the packing device 2 is housed in the space disposed between said upper compartment 1A and said lower compartment 1B. More specifically, the cooling appliance 1 shown in the figures is a conventional combined refrigerator and thus comprises an upper refrigerator compartment 1A and a lower freezer compartment 1B.

[0015] The fact that the space between the upper compartment 1A and the lower compartment 1B is used first of all allows the use of a space that would not otherwise be used. Secondly, said space is situated at an ergonomic working height, which enables the packing device 2 to be disposed practically in line with the kitchen worktop and therefore in an optimal position for its use. Said location also ensures that said packing device 2 may be accessed by physically handicapped people.

[0016] The packing means 3 of the packing device 2 comprise a main body 4 and a cover 5, said main body 4 and said cover 5 forming the vacuum chamber. The main body 4, shown in Figure 3, comprises a suction hole 6 for extracting air with the suction means, and a base 7, shown in Figure 4, with a suction pipe 8 connected to said suction hole 6. The base 7 is detachable, which makes the packing device 2 easier to clean. The suction means comprise a suction pump (not shown in the figures) that is housed inside the main body 4. The fact that the suction pump is housed in the main body 4, and therefore close to the suction hole 6 and the air intake 24, helps to reduce load losses.

[0017] The main body 4 also comprises, as shown in

Figure 2, a foam seal 9 that surrounds the base 7. Said foam seal 9 forms, along with a respective foam seal 10 disposed on the cover 5, a hermetic seal in the vacuum chamber.

[0018] In addition the sealing means of the packing device 2 comprise a longitudinal sealing element 25 disposed on the cover 5. Said sealing means also comprise a seal 11 on the main body 4. The main body 4 also comprises an interface 12 with a plurality of buttons 13 to enable a user to control the packing device 2. The air intake 24 is disposed on said interface 12.

[0019] No details are provided with regard to how the aforementioned packing means 3 function as this is very well known in the prior art.

[0020] As can be seen in the figures, the packing device 2 of the cooling appliance 1 of the invention comprises a tray 14 that is disposed in a substantially horizontal manner and adjacent to the packing means 3 when said packing device 2 is extracted, the products to be packed being disposed on said tray 14 for their vacuum packing. More specifically, when the packing device 2 is extracted, the packing means 3 are disposed adjacent to the side of the tray 14 closest to the cooling appliance 1, and said packing device 2 comprises, on the side of the tray 14 furthest from said cooling appliance 1, as can be seen in Figure 7, a roll-holder housing 15 for storing a roll of flexible material for making flexible bags. Said roll-holder housing 15 has a cover 17 that covers the roll of flexible material. The main body 4, the tray 14 and the roll-holder housing 15 are connected to each other to form a single unit that moves together as one.

[0021] As shown in Figure 7, the roll-holder housing 15 comprises a knife cutting device 16 that slides longitudinally along said roll-holder housing 15 in order to cut the flexible material and make bags of the required size. In this embodiment, the knife cutting device 16 is disposed on the cover 17 of the roll-holder housing 15 and can slide along a groove that is also disposed on the cover 17.

[0022] In a preferred embodiment, the tray 14 is made of glass for aesthetic and hygiene-related purposes.

[0023] In this embodiment the cooling appliance 1 of the invention comprises, in order to allow the packing device 2 to move from its hidden position to its position of use, conventional guides that are not shown in the figures and which make the unit more rigid. In addition, in this embodiment the cooling appliance 1 also comprises a box 18, shown in Figure 5, that is fixed inside the structure of said cooling appliance 1. Said box 18 comprises a housing 19 for the packing device 2 and also comprises, as can be seen in Figure 5, two channels 22 and 23 in which the guides for moving the packing device 2 are disposed.

[0024] The cooling appliance 1 also has a frontally disposed base 20. Said base 20, shown in Figure 6, comprises a central hole 21 through which the packing device 2 is extracted, and is fixed to the structure of the cooling appliance 1.

[0025] Furthermore, in order to enable the packing device 2 to move in a simple and comfortable manner and to prevent the addition of supplementary elements such as handles, in a preferred embodiment said packing device 2 comprises a button-operated extraction mechanism. By pressing lightly on the packing device 2 when it is inside the cooling appliance 1 said packing device 2 may be released and allowed to move outwards. Said button-operated extraction mechanism is not described in detail as it is already known in the prior art and is widely used for example in drawers and similar elements. It may be the case that the extraction mechanism is operated not by the mechanical pressing of the packing device 2, but by the pressing of a touchscreen disposed on the door of the cooling appliance 1.

[0026] The packing device 2 receives the electrical current of the cooling appliance 1. Said packing device 2 thus comprises a connection cable 27 at its rear part. As can be seen in Figures 8 and 9, which show the packing device 2 housed in the bottom half of the box 18, the packing device 2 comprises, in order to guide the movement of said connection cable 27 when the packing device 2 is extracted or inserted, two articulated arms 28 and 29 connected to the connection cable 27 by means of flanges. One of said articulated arms is connected pivotally to the rear part of the packing device 2, and the other articulated arm is connected to the structure of the cooling appliance 1, specifically to the box 18.

[0027] The packing device 2 is connected to the electrical current only when it is to be used. For this purpose said packing device 2 comprises a switch 30 disposed in this embodiment on one of the sides of the main body 4.

[0028] In a preferred embodiment the packing device 2 is a separate unit and may be detached from the cooling appliance 1. As a result, in the event of the packing device 2 breaking down, all that is required is to replace it with another one. This also enables the simple addition of a packing device 2 to cooling appliances that do not initially comprise them, or the inclusion of the packing device 2 as an optional feature in cooling appliances available on the market. Furthermore, the fact that the packing device 2 is a separate and detachable unit may even give rise to an embodiment in which said packing device 2 could also be used as a separate accessory should the user so require.

Claims

1. Cooling appliance that comprises a structure comprising a vacuum packing device (2), said packing device (2) being suitable for vacuum packing products contained in flexible bags, the packing device (2) comprising packing means (3) that comprise a vacuum chamber in which an open end of a flexible bag is disposed, suction means for extracting air from said vacuum chamber, and

sealing means for closing said flexible bag along a line beyond the vacuum chamber,

characterised in that said packing device (2) is housed inside the structure of the cooling appliance (1) when it is not being used, and is slidably extractable for its use.

2. Cooling appliance according to claim 1, wherein the packing device (2) is housed inside the structure of a cooling appliance (1) in a substantially horizontal position and is extractable by means of a linear movement of said packing device (2).

3. Cooling appliance according to claim 2, comprising an upper compartment (1A) and a lower compartment (1B), one of said compartments being a refrigerator compartment and the other compartment being a freezer compartment, the packing device (2) being housed in the space disposed between said upper compartment (1A) and said lower compartment (1B).

4. Cooling appliance according to claim 3, wherein said cooling appliance (1) is a conventional domestic combined refrigerator and therefore comprises an upper refrigerator compartment (1A) and a lower freezer compartment (1B).

5. Cooling appliance according to any of the preceding claims, wherein the packing means (3) comprise a main body (4) and a cover (5), said main body (4) and said cover (5) forming the vacuum chamber, and said main body (4) comprising a suction hole (6) for extracting air with the suction means, a base (7) with a suction pipe (8) connected to said suction hole (6), said base (7) being detachable, and a foam seal (9) that surrounds said base (7), said foam seal (9) forming, along with a respective foam seal (10) disposed on the cover (5), a hermetic seal in the vacuum chamber.

6. Cooling appliance according to claim 5, wherein the packing device (2) comprises an air intake (24) disposed on the main body (4) suitable for the connection of one end of a vacuum tube to create a vacuum in containers such as pots and jars.

7. Cooling appliance according to claims 5 or 6, wherein the suction means comprise a suction pump housed inside the main body (4).

8. Cooling appliance according to any of claims 5 to 7, wherein the sealing means comprise a longitudinal sealing element (25) disposed on the cover (5) or on the main body (4).

9. Cooling appliance according to any of claims 5 to 8,

wherein the main body (4) comprises an interface (12) with a plurality of buttons (13) to enable a user to control the packing device (2).

10. Cooling appliance according to any of the preceding claims, wherein the packing device (2) comprises a tray (14) that is disposed in a substantially horizontal manner and adjacent to the packing means (3) when said packing device (2) is extracted, the products being disposed on said tray (14) for their packing. 5
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11. Cooling appliance according to claim 10, wherein, when the packing device (2) is extracted, the packing means (3) are disposed adjacent to the side of the tray (14) closest to the cooling appliance (1), and said packing device (2) comprises, on the side of the tray (14) furthest from said refrigerator (1), a roll-holder housing (15) for storing a roll of flexible material for making flexible bags. 15
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12. Cooling appliance according to claim 11, wherein the roll-holder housing (15) comprises a knife cutting device (16) that slides longitudinally along said roll-holder housing (15) in order to cut the flexible material to the required size. 25
13. Cooling appliance according to any of claims 10 to 12, wherein the tray (14) is made of glass.
14. Cooling appliance according to any of the preceding claims, wherein the packing device (2) comprises a connection cable (27) in its rear part, said packing device (2) comprising articulated arms (28,29) connected to said connection cable (27). 30
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15. Cooling appliance according to any of the preceding claims, wherein the packing device (2) is a separate unit and may be detached from the cooling appliance (1). 40

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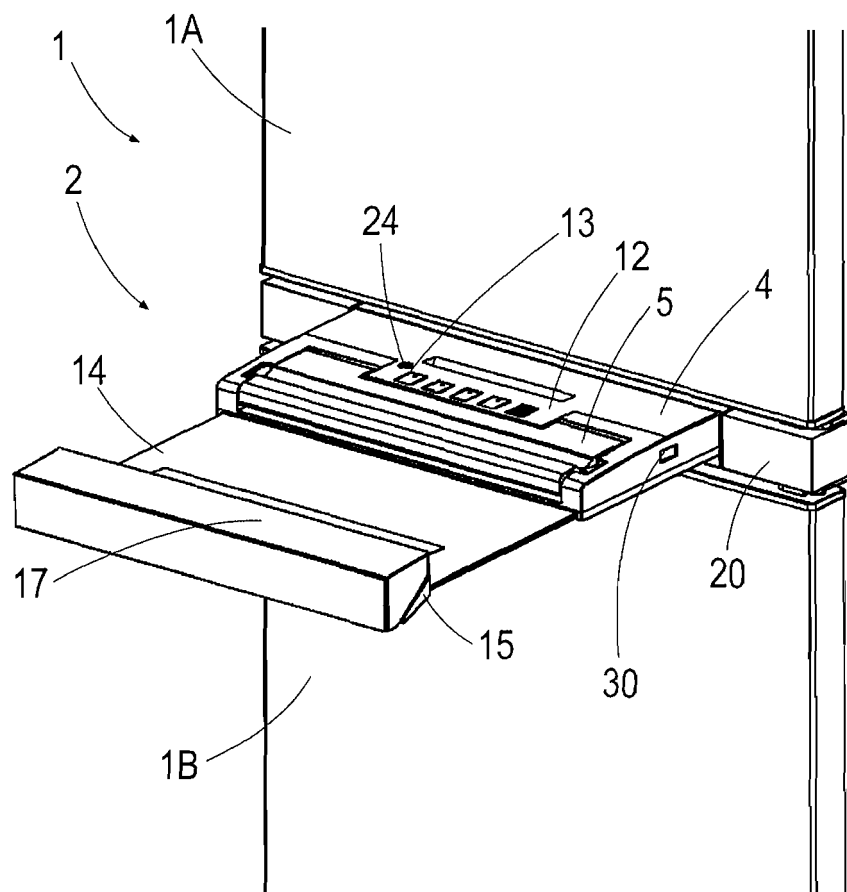


Fig. 1

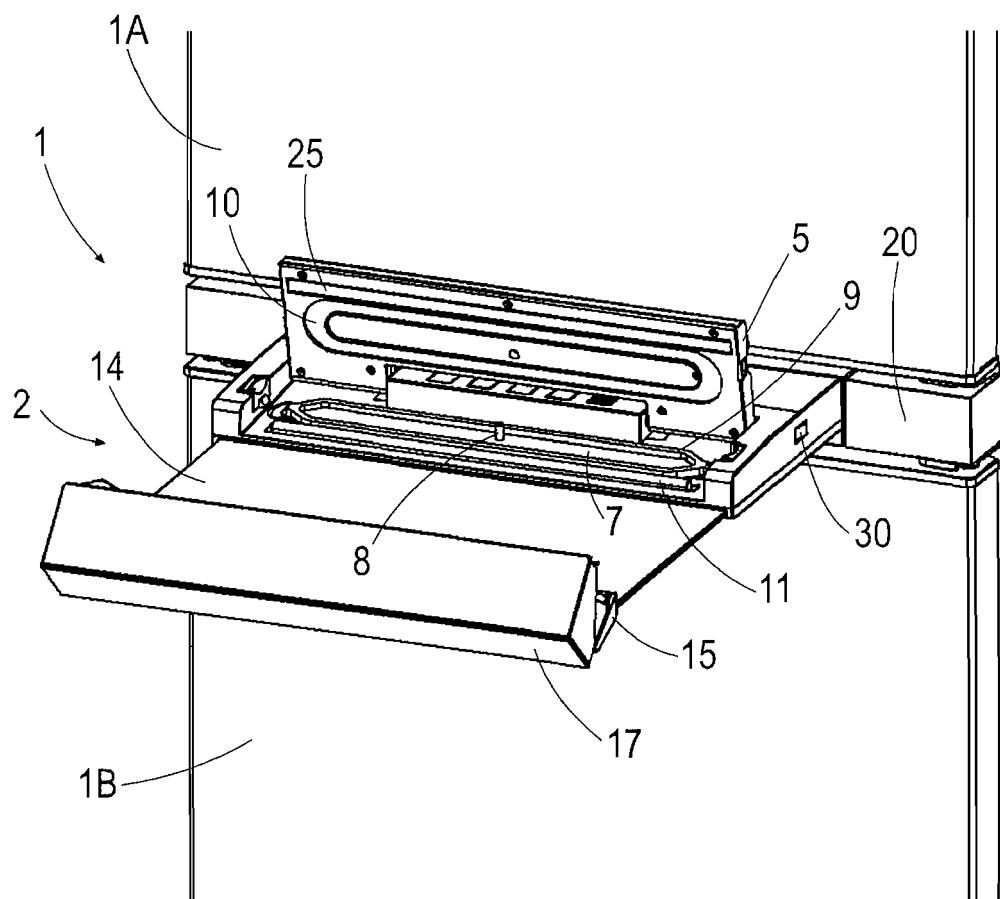


Fig. 2

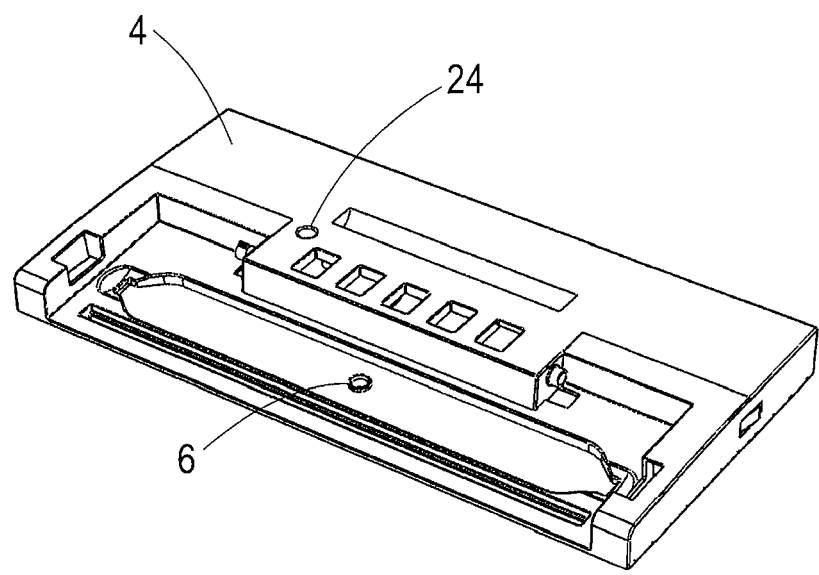


Fig. 3

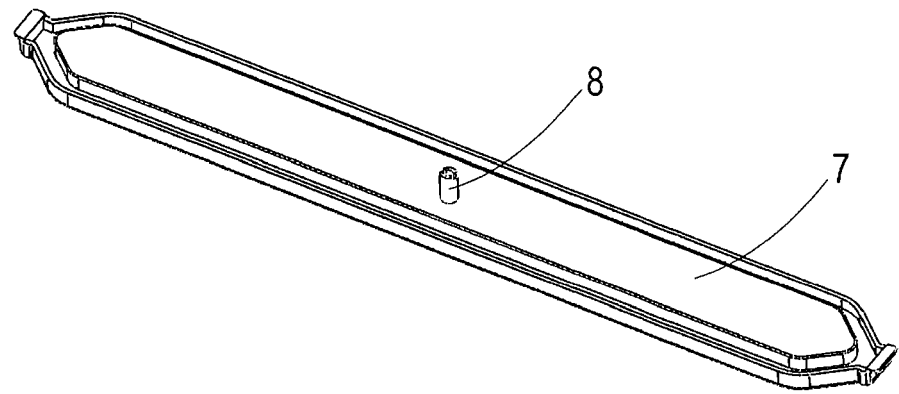


Fig. 4

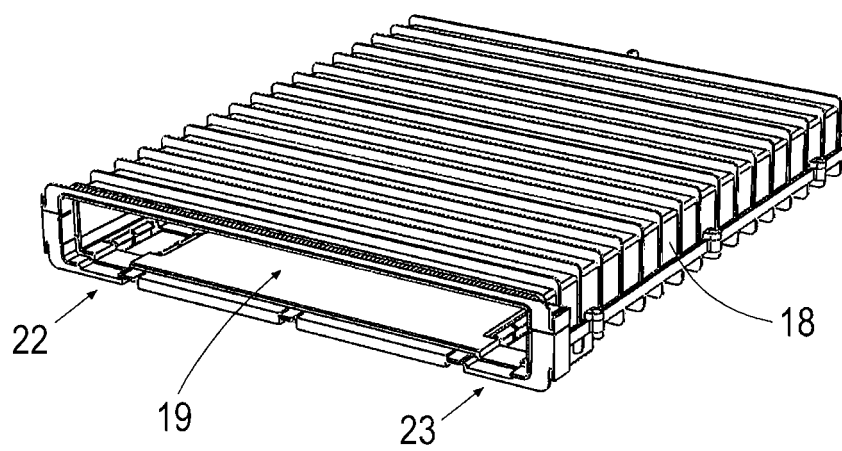


Fig. 5

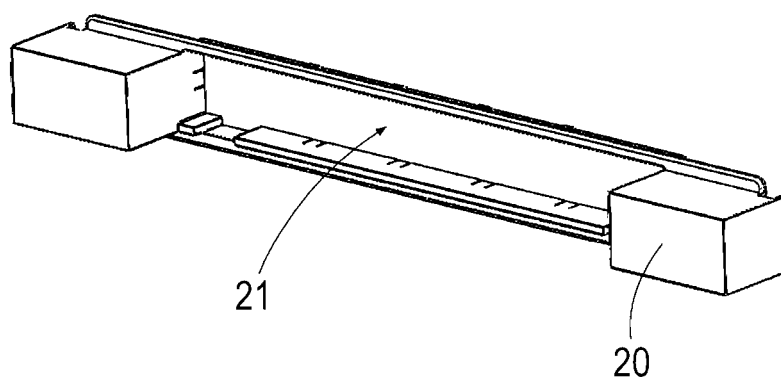


Fig. 6

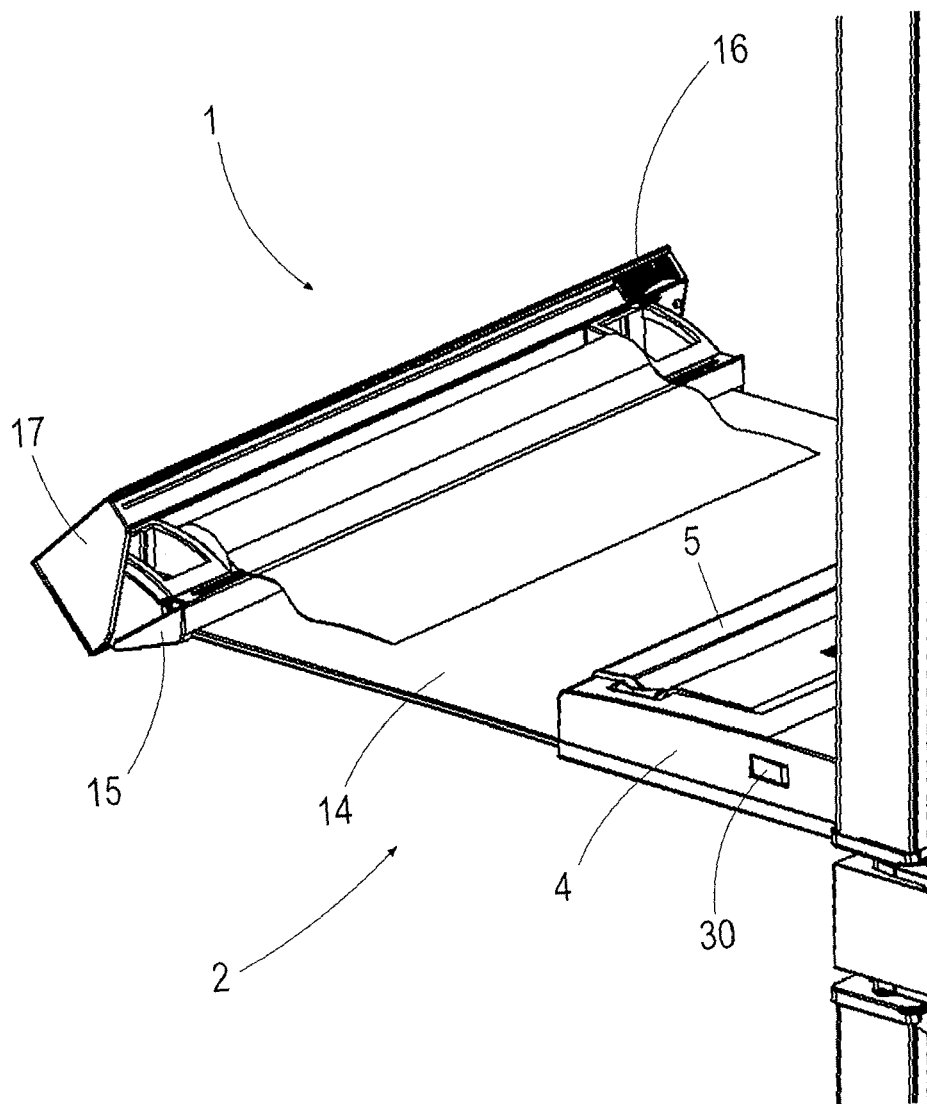


Fig. 7

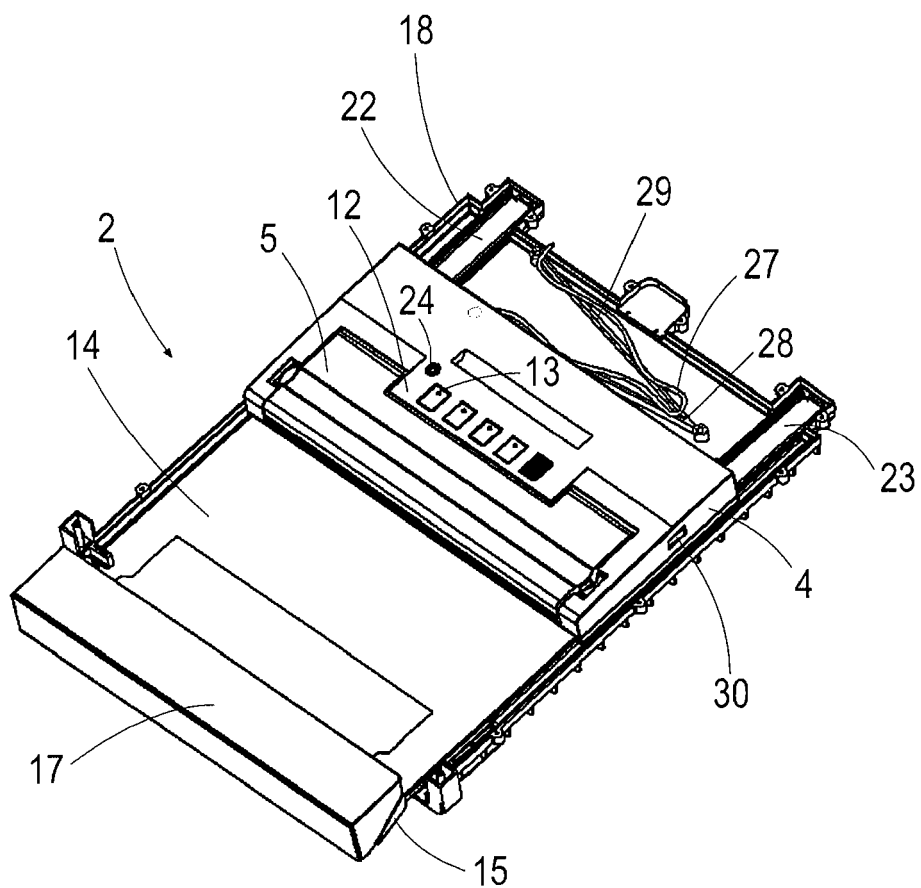


Fig. 8

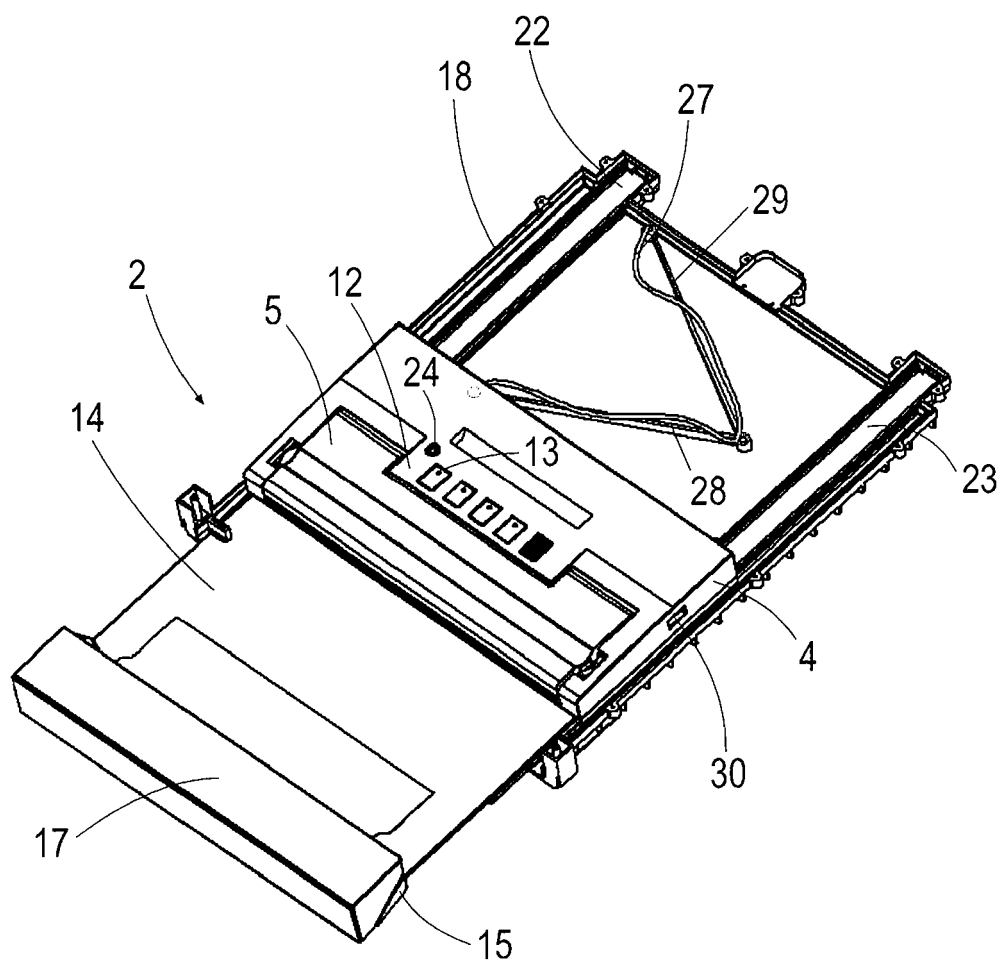


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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