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(72) Inventors:  
• **EROL, SEMIH**  
**34445 ISTANBUL (TR)**  
• **AKYUZ, ERCAN**  
**34445 ISTANBUL (TR)**  
• **EVREN, IBRAHIM YILMAZ**  
**34445 ISTANBUL (TR)**  
• **YAVUZ, RESUL**  
**34445 ISTANBUL (TR)**  
• **CALISKAN, ALTINAL**  
**34445 ISTANBUL (TR)**

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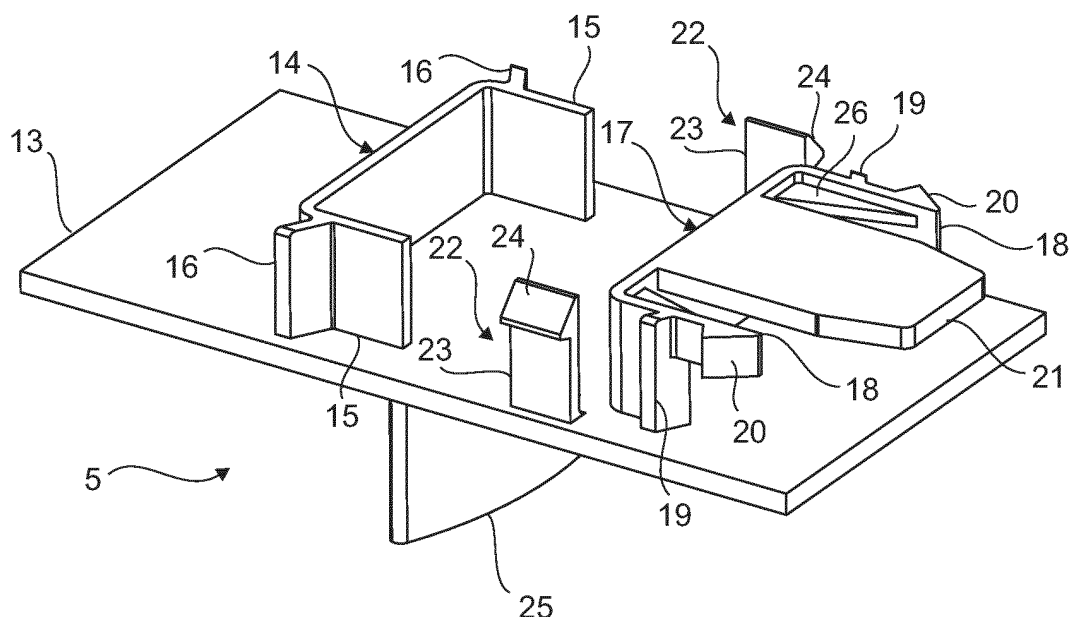
(71) Applicant: **Arçelik Anonim Sirketi**  
**34445 Istanbul (TR)**

(54) **A COOLING DEVICE COMPRISING AN AIR GUIDING MEMBER**

(57) The present invention relates to a cooling device (1) comprising a fresh food compartment (2); a freezing compartment (3), a partition (4) which separates the freezing compartment (3) from the fresh food compartment (2); an evaporator (5) which is disposed behind the freezing compartment (3); an air guiding member (6) which is placed onto the partition (4) surface adjacent to the freezing compartment (3) so as to form the base of

the freezing compartment (3) and which guides the air leaving the evaporator (5) towards the front side of the freezing compartment (3); one or more than one locking housing (7) arranged on the partition (4) surface adjacent to the freezing compartment (3) so as to protrude into the partition (4); and one or more than one locking member (8) fixed to the locking housing (7) in both vertical and horizontal axes.

**Figure 4**



## Description

**[0001]** The present invention relates to a cooling device comprising a locking member used for grouping the air guiding member.

**[0002]** In cooling devices with two compartments, the air guiding member forming the bottom of the freezing compartment guides the cold air from the back to the front. In the state of the art, the air guiding member is locked and fixed into the housings formed by thermoforming by means of flexible claws. However, in said state of the art embodiment, in case the components are not formed properly during the thermoforming process, the locking cannot be performed in a proper manner. In this case, a gap remains between the air guiding member and the part to be fixed. This causes the air guiding member to fail to carry out its function and to be easily dislodged by the user.

**[0003]** The state of the art Chinese Patent Application No. CN109357468 discloses the mounting of the air guiding member by means of the claw-shaped fixing members.

**[0004]** The state of the art United States Patent No. US5577822 discloses the mounting of an air guiding member to the cooling device by means of a spring mechanism.

**[0005]** Another state of the art patent is the United States Patent No. US5727859. This document discloses the mounting of an evaporator lid to the rear wall of the cooling device by means of claws.

**[0006]** In the state of the art Chinese Patent Application No. CN110081646, a cooling device is disclosed, comprising an air guiding member which is mounted by means of fixing members.

**[0007]** The aim of the present invention is the realization of a cooling device wherein the air guiding member is grouped in a hermetic manner.

**[0008]** The cooling device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a freezing compartment; a fresh food compartment; a partition which separates the freezing compartment from the fresh food compartment; an air guiding member which is disposed on the partition surface adjacent to the freezing compartment so as to form the base of the freezing compartment and which guides the air leaving the evaporator towards the front side of the freezing compartment.

**[0009]** The cooling device further comprises one or more than one locking housing arranged on the partition surface adjacent to the freezing compartment so as to protrude into the partition. The locking housing is flush with the base of the freezing compartment and does not protrude into the freezing compartment. The locking housing is a quadrilateral recess and comprises two locking protrusions on each of the long sides so as to extend towards the center of the locking housing and one fixed claw housing on each of the long sides between the two neighbor locking protrusions. The locking housing further

comprises a locking recess on one short side between the base of the locking housing and said short side.

**[0010]** In the embodiment of the present invention, the locking protrusion is in the form of a truncated triangle when viewed from above and comprises two side walls inclined from the side of the housing towards the center thereof.

**[0011]** The locking member has a quadrilateral base, a U-shaped first wall on the base, extending perpendicular to the base, two first arms which form the opposite walls of said first wall and extend in the horizontal axis, and a first stopper which extends on said two first arms in the vertical axis so as to protrude outwards.

**[0012]** The locking member further has a U-shaped second wall which again extends perpendicular to the base, two second arms which form the opposite walls of said second wall and extend in the horizontal axis, a second surface which is provided on the two second arms in the horizontal axis so as to face outwards and to be inclined towards the end of the second arm, and a second stopper which is arranged on the second arm so as to be distanced from the second surface. In this embodiment of the present invention, the locking member comprises a locking tab which extends on the second wall between the second arms so as to be parallel to the second arms and the base. A distance equal to the height of the second wall remains between the locking tab and the base. The locking tab is longer than the second arms.

**[0013]** The locking member comprises two fixed claws which are oppositely disposed between the first wall and the second wall and which extend perpendicular to the base. The fixed claw has a third arm which extends from the base and a third surface on said third arm so as to extend outwards in the vertical axis and incline towards the end of the third arm. By means of the third surface, the fixed claw slidably engages with the fixed claw housing. In this embodiment of the present invention, the base of the fixed claw housing is also inclined. The width of the fixed claw housing is larger than the fixed claw.

**[0014]** The locking member is fixed into the locking housing. The locking process is realized as follows: The fixed claws on the locking member engage with the fixed claw housing on the locking housing. In this position, the first wall and the first stopper are behind the locking protrusion while the second wall and the second stopper are between the two locking protrusions and the first and second stoppers do not contact the locking protrusions. At the same time, the locking tab is outside the locking recess, but is aligned with the same.

**[0015]** In this position, the locking member is slid forwards in the locking housing. As a result of this sliding movement, the first stopper on the first wall bears against the inclined side wall of the first locking protrusion in the sliding direction. At the same time, the second surface on the second arm on the second wall contacts the inclined side wall of the first locking protrusion in the sliding direction. As a result of this contact, while the sliding movement continues the second arm stretches towards

the center of the second wall and the second surface slides over the inclined side wall of the locking protrusion and passes over the side wall to be seated on the other side wall. At the same time, the second stopper is fully seated on the side wall of the locking protrusion and in this case the locking protrusion is positioned between the second arm and the second stopper. In this case the fixed claw bears against the side wall of the fixed claw housing. Meanwhile, the locking tab is fully seated into the locking recess. Thus, the locking member is fully fixed into the locking housing. Consequently, the air guiding member is also fully fixed onto the partition.

**[0016]** By means of the present invention, the locking member is fixed to the locking housing by using three locking elements. Thus, the air guiding member is enabled to be fully fixed onto the partition so as to form the base of the freezing compartment such that no gap remains therebetween. Consequently, the problems such as the user inadvertently dislodging or displacing the air guiding member are eliminated.

**[0017]** A cooling device realized in order to attain the aim the object of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of a cooling device.

Figure 2 - is the top cross-sectional view of a freezing compartment together with the locking housings.

Figure 3 - is the sideways cross-sectional view of the freezing compartment.

Figure 4 - is the perspective view of the locking member.

Figure 5 - is the top view of the locking member.

Figure 6 - is the top view of the locking housing.

Figure 7 - is the top view of the locking member when fitted into the locking housing.

Figure 8 - is the top view of the locking member when fixed into the locking housing.

Figure 9 - is the view of the cross-section J - J in Figure 8.

**[0018]** The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Fresh food compartment
3. Freezing compartment
4. Partition

5. Evaporator

6. Air guiding member

7. Locking housing

8. Locking member

9. Locking protrusion

10. Fixed claw housing

11. Locking recess

12. Side wall

13. Base

14. First wall

15. First arm

16. First stopper

17. Second wall

18. Second arm

19. Second stopper

20. Second surface

21. Locking tab

22. Fixed claw

23. Third arm

24. Third surface

25. Holder

26. Barrier

**[0019]** The cooling device (1) of the present invention comprises a fresh food compartment (2); a freezing compartment (3), a partition (4) which separates the freezing compartment (3) from the fresh food compartment (2); an evaporator (5) which is disposed behind the freezing compartment (3); an air guiding member (6) which is placed onto the partition (4) surface adjacent to the freezing compartment (3) so as to form the base of the freezing compartment (3) and which guides the air leaving the evaporator (5) towards the front side of the freezing compartment (3); one or more than one locking housing (7) arranged on the partition (4) surface adjacent to the freezing compartment (3) so as to protrude into the partition (4); and one or more than one locking member (8) fixed

to the locking housing (7) in both vertical and horizontal axes. Thus, the user is prevented from inadvertently dislodging or displacing the air guiding member (6). Moreover, the risk of leaving any gap between the air guiding member (6) and the part to which the same is fixed is eliminated, and the air guiding member (6) is enabled to be fixed in a hermetic manner (Figure 1 and Figure 3).

**[0020]** The locking housing (7) is flush with the base of the freezing compartment (3) and does not protrude into the freezing compartment (3). The locking housing (7) is a quadrilateral recess and comprises two locking protrusions (9) on each of the long sides so as to extend towards each other and one fixed claw housing (10) on each of the long sides between the two neighbor locking protrusions (9). The locking housing (7) further comprises a locking recess (11) on one short side between the base of the locking housing (7) and said short side. In an embodiment of the present invention, there are four locking housings (7) (Figure 2).

**[0021]** In the embodiment of the present invention, the locking protrusion (9) is in the form of a truncated triangle and comprises two side walls (12) inclined from the side of the locking housing (7) towards the center thereof.

**[0022]** The locking member (8) has a quadrilateral base (13), a U-shaped first wall (14) on the base (13), extending perpendicular to the base (13), two first arms (15) which form the opposite walls of said first wall (14) and extend in the horizontal axis, and a first stopper (16) which extends on said two first arms (15) in the vertical axis so as to protrude outwards (Figure 4)..

**[0023]** The locking member (8) further has a U-shaped second wall (17) which again extends perpendicular to the base (13), two second arms (18) which form the opposite walls of said second wall (17) and extend in the horizontal axis, a second surface (20) which is provided on the two second arms (18) in the horizontal axis so as to face outwards and to be inclined towards the end of the second arm (18), and a second stopper (19) which is arranged on the second arm (18) so as to be distanced from the second surface (20). The second stopper (19) is equal to the height of the second arm (18) and there is a gap between the base and the part of the second arm (18) where the second surface (20) is arranged. Thus, said part of the second arm (18) is enabled to stretch. In this embodiment of the present invention, the locking member (8) comprises a barrier (26) which joins the rear surface of the second arm (18) and the second wall (17) and which increases the strength of the second arm (18) so as to prevent the second surface (20) from stretching more than allowed and being broken. The barrier (26) is in the form of a triangle with one side contacting the second wall (17) and the other side perpendicular to said side contacting the second arm (18) (Figure 5).

**[0024]** In this embodiment of the present invention, the locking member (8) comprises a locking tab (21) which extends on the second wall (17) between the second arms (18) so as to be parallel to the second arms (18) and the base (13). A distance equal to the height of the

second wall (17) remains between the locking tab (21) and the base (13). The locking tab (21) is longer than the second arms (18).

**[0025]** The locking member (8) comprises two fixed claws (22) which are oppositely disposed between the first wall (14) and the second wall (17) and which extend perpendicular to the base (13). The fixed claw (22) has a third arm (23) which extends from the base (13) and a third surface (24) on said third arm (23) so as to extend outwards in the vertical axis and incline towards the end of the third arm (23). By means of the third surface (24), the fixed claw (22) slidably engages with the fixed claw housing (10). In this embodiment of the present invention, the base of the fixed claw housing (10) is also inclined. The width of the fixed claw housing (10) is larger than the fixed claw (22) (Figure 6).

**[0026]** The locking member (8) comprises a protrusion-shaped holder (25) which is arranged on the other surface of the base (13) and which extends perpendicular to the base (13). When the air guiding member (6) is fixed in place, the holder (25) extends into the freezing compartment (3). In the embodiment of the present invention, the height of the holder (25) is not more than the depth of the locking housing (7).

**[0027]** The locking member (8) is fixed into the locking housing (7). The locking process is realized as follows: The fixed claws (22) on the locking member (8) engage with the fixed claw housing (10) on the locking housing (7). In this position, while the first wall (14) and the first stopper (16) are behind the locking protrusion (9), the second wall (17) and the second stopper (19) are between the two locking protrusions (9). The first and second stoppers (16 and 19) do not contact the locking protrusions (9). At the same time, the locking tab (21) is outside the locking recess (11), but is aligned with the same (Figure 7).

**[0028]** In this position, the locking member (8) is slid forwards in the locking housing (7). As a result of this sliding movement, the first stopper (16) on the first wall (14) bears against the inclined side wall (12) of the first locking protrusion (9) in the sliding direction. At the same time, the second surface (20) on the second arm (18) on the second wall (17) contacts the inclined side wall (12) of the first locking protrusion (9) in the sliding direction. As a result of this contact, while the sliding movement continues the second arm (18) stretches towards the center of the second wall (17) and the second surface (20) slides over the inclined side wall (12) of the locking protrusion (8) and passes over the side wall (12) to be seated on the other side wall (12). At the same time, the second stopper (19) is fully seated on the side wall (12) of the locking protrusion (9) and in this case the locking protrusion (9) is positioned between the second arm (18) and the second stopper (19). In this case the fixed claw (22) bears against the side wall (12) of the fixed claw housing (10). Meanwhile, the locking tab (21) is fully seated into the locking recess (11). Thus, the locking member (8) is fully fixed into the locking housing (7) such that the

air guiding member (6) is fully mounted onto the partition (4) (Figure 8 and Figure 9).

[0029] By means of the present invention, the locking member (8) is fixed to the locking housing (7) by using three locking elements. Thus, the air guiding member (6) is enabled to be fully fixed onto the partition (4) so as to form the base of the freezing compartment (3) such that no gap remains therebetween. Consequently, the problems such as the user inadvertently dislodging or displacing the air guiding member (6) are eliminated.

## Claims

1. A cooling device (1) **comprising** a fresh food compartment (2); a freezing compartment (3), a partition (4) which separates the freezing compartment (3) from the fresh food compartment (2); an evaporator (5) which is disposed behind the freezing compartment (3); and an air guiding member (6) which is placed onto the partition (4) surface adjacent to the freezing compartment (3) so as to form the base of the freezing compartment (3) and which guides the air leaving the evaporator (5) towards the front side of the freezing compartment (3), **characterized by** one or more than one locking housing (7) arranged on the partition (4) surface adjacent to the freezing compartment (3) so as to protrude into the partition (4); and one or more than one locking member (8) fixed to the locking housing (7) in both vertical and horizontal axes.
2. A cooling device (1) as in Claim 1, **characterized by** the locking housing (7) which is a quadrilateral recess and which comprises two locking protrusions (9) on each of the long sides so as to extend towards each other and one fixed claw housing (10) on each of the long sides between the two neighbor locking protrusions (9).
3. A cooling device (1) as in Claim 2, **characterized by** the locking housing (7) comprising a locking recess (11) on one short side between the base thereof and said short side.
4. A cooling device (1) as in Claim 2, **characterized by** the locking protrusion (9) comprising two side walls (12) inclined from the side of the locking housing (7) towards the center thereof.
5. A cooling device (1) as in Claim 1, **characterized by** the locking member (8) having a quadrilateral base (13), a U-shaped first wall (14) on the base (13), extending perpendicular to the base (13), two first arms (15) which form the opposite walls of said first wall (14) and extend in the horizontal axis, and a first stopper (16) which extends on said two first arms (15) in the vertical axis so as to protrude outwards.
6. A cooling device (1) as in Claim 1 and 5, **characterized by** the locking member (8) having a U-shaped second wall (17) which again extends perpendicular to the base (13), two second arms (18) which form the opposite walls of said second wall (17) and extend in the horizontal axis, a second surface (20) which is provided on the two second arms (18) in the horizontal axis so as to face outwards and to be inclined towards the end of the second arm (18), and a second stopper (19) which is arranged on the second arm (18) so as to be distanced from the second surface (20).
7. A cooling device (1) as in Claim 6, **characterized by** the locking member (8) comprising a barrier (26) which joins the rear surface of the second arm (18) and the second wall (17) and which increases the strength of the second arm (18) so as to prevent the second surface (20) from stretching more than allowed and being broken.
8. A cooling device (1) as in Claim 6 and 7, **characterized by** the locking member (8) comprising a locking tab (21) which extends on the second wall (17) between the second arms (18) so as to be parallel to the second arms (18) and the base (13).
9. A cooling device (1) as in any one of the Claims 5 to 8, **characterized by** the locking member (8) comprising two fixed claws (22) which are oppositely disposed between the first wall (14) and the second wall (17) and which extend perpendicular to the base (13).
10. A cooling device (1) as in Claim 9, **characterized by** the fixed claw (22) having a third arm (23) which extends from the base (13) and a third surface (24) on said third arm (23) so as to extend outwards in the vertical axis and incline towards the end of the third arm (23).
11. A cooling device (1) as in any one of the Claims 5 to 11, **characterized by** the locking member (8) comprising a protrusion-shaped holder (25) which is arranged on the other surface of the base (13) and which extends perpendicular to the base (13).

Figure 1

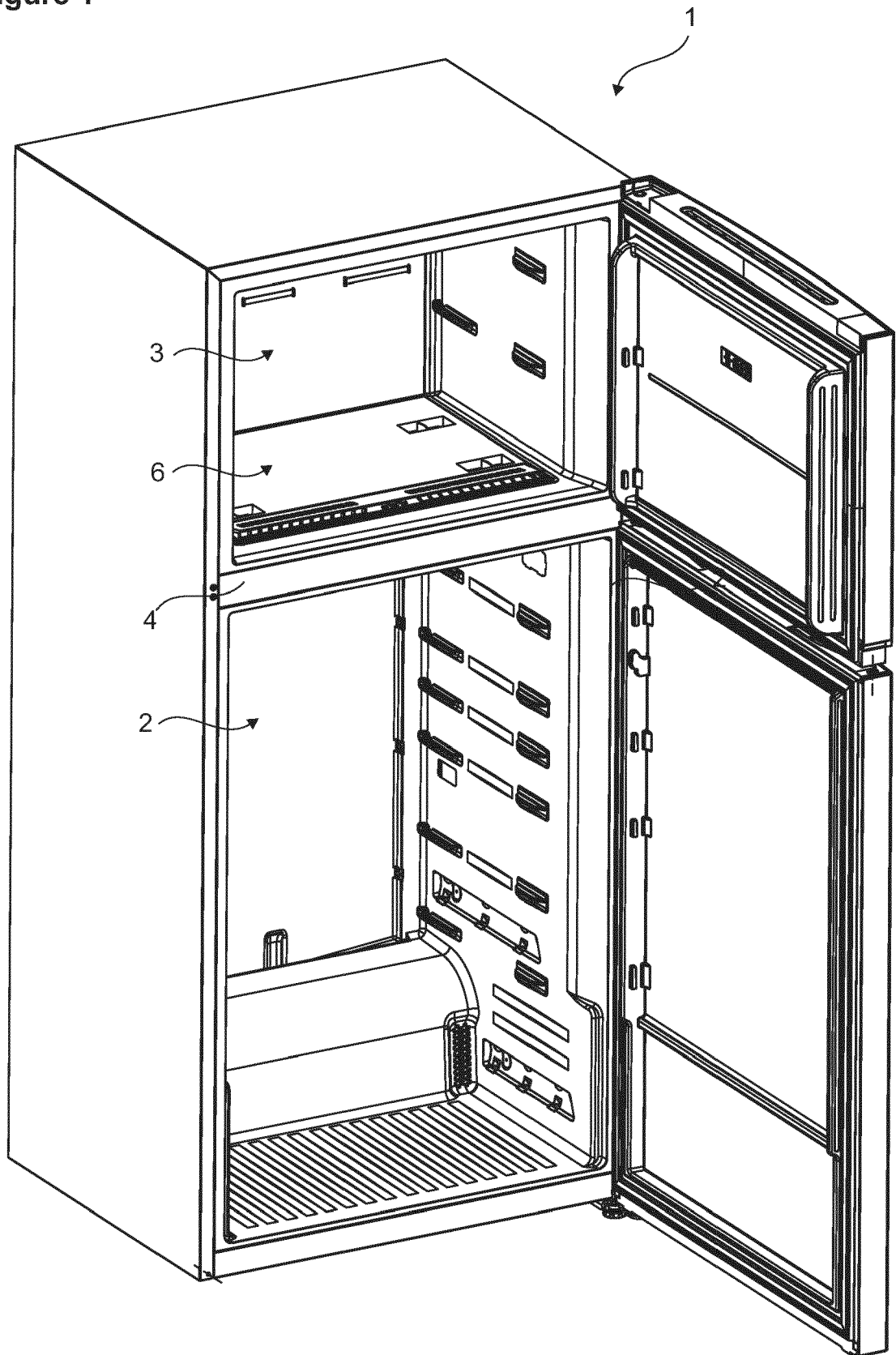


Figure 2

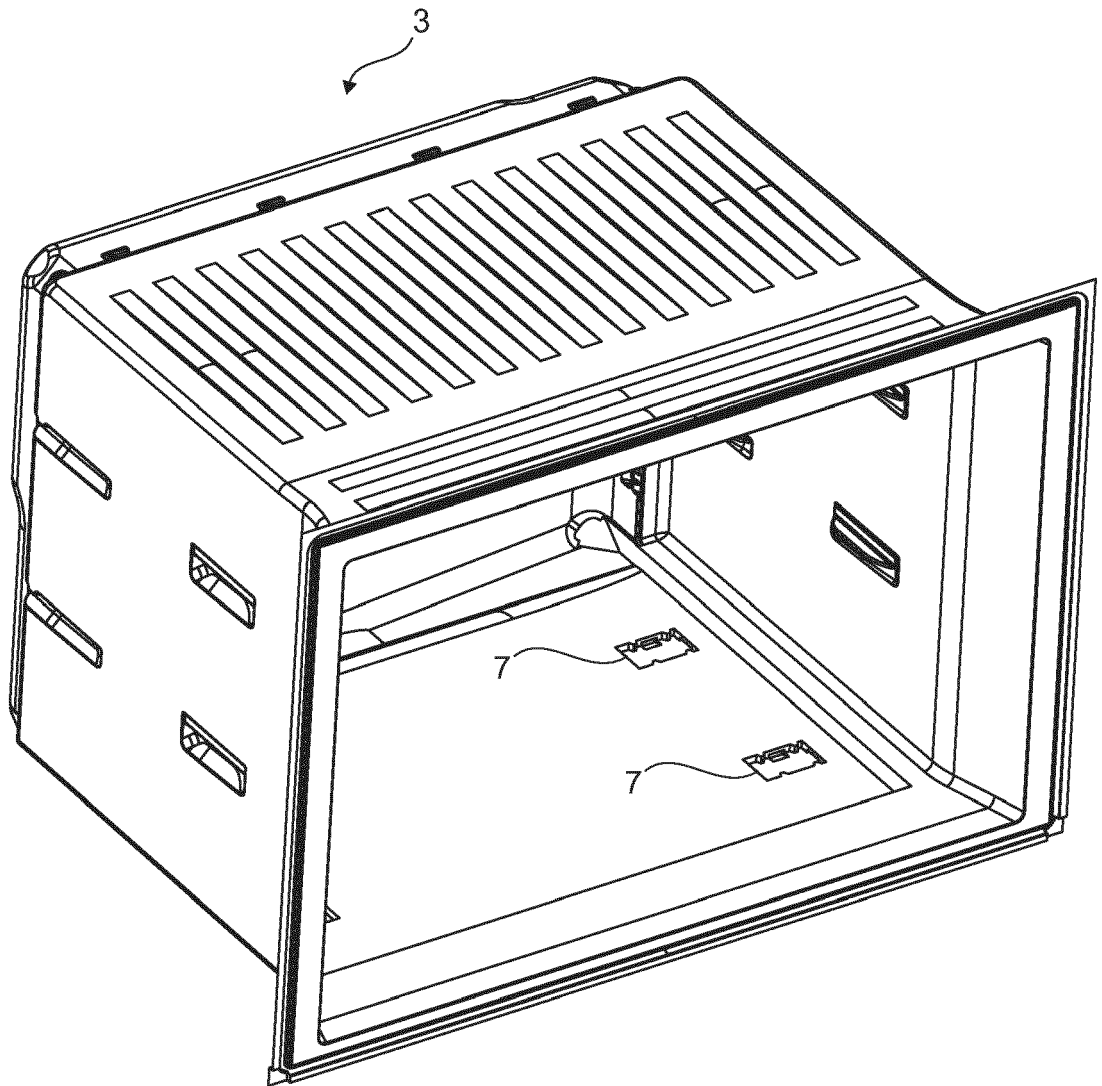


Figure 3

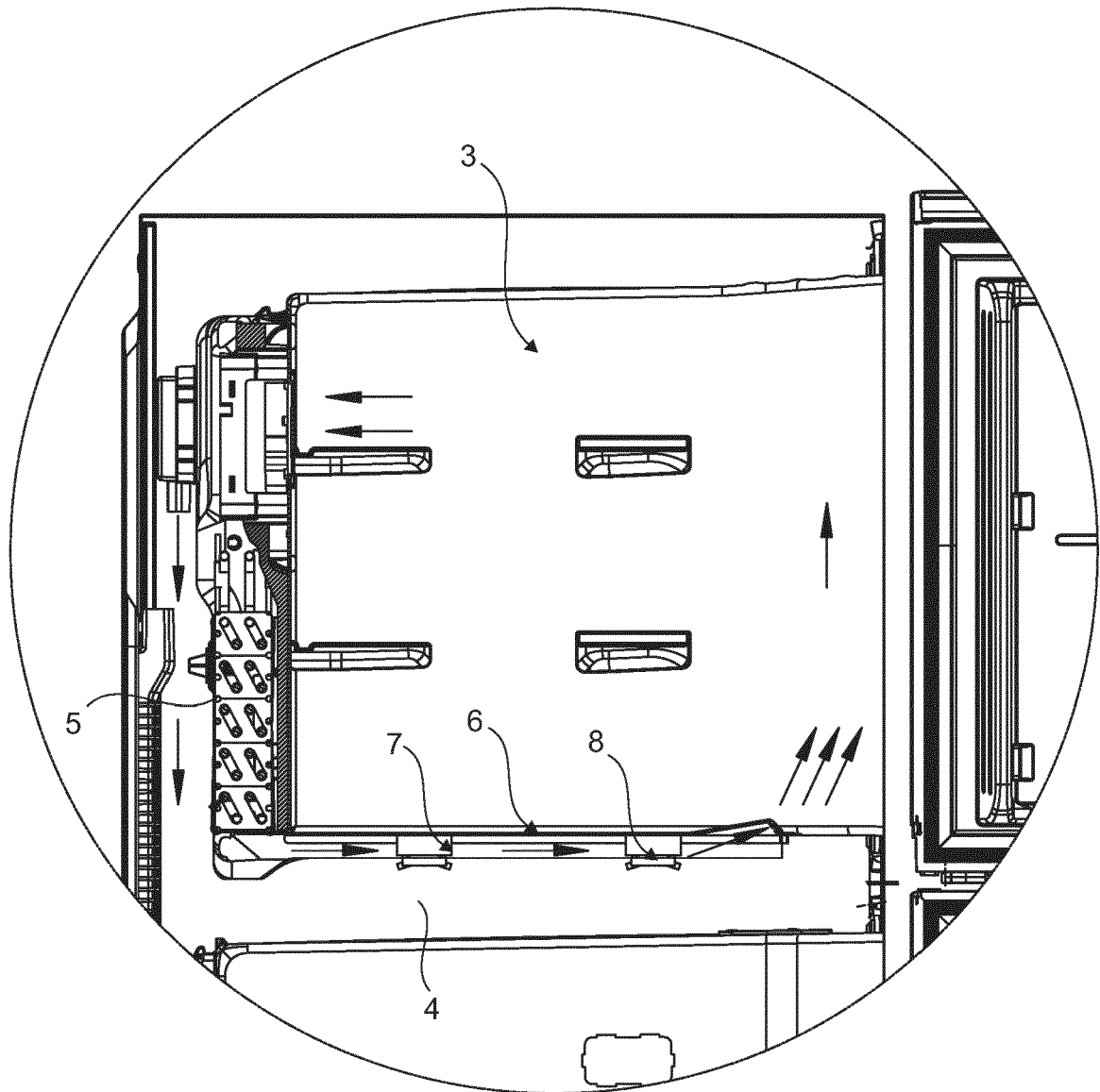


Figure 4

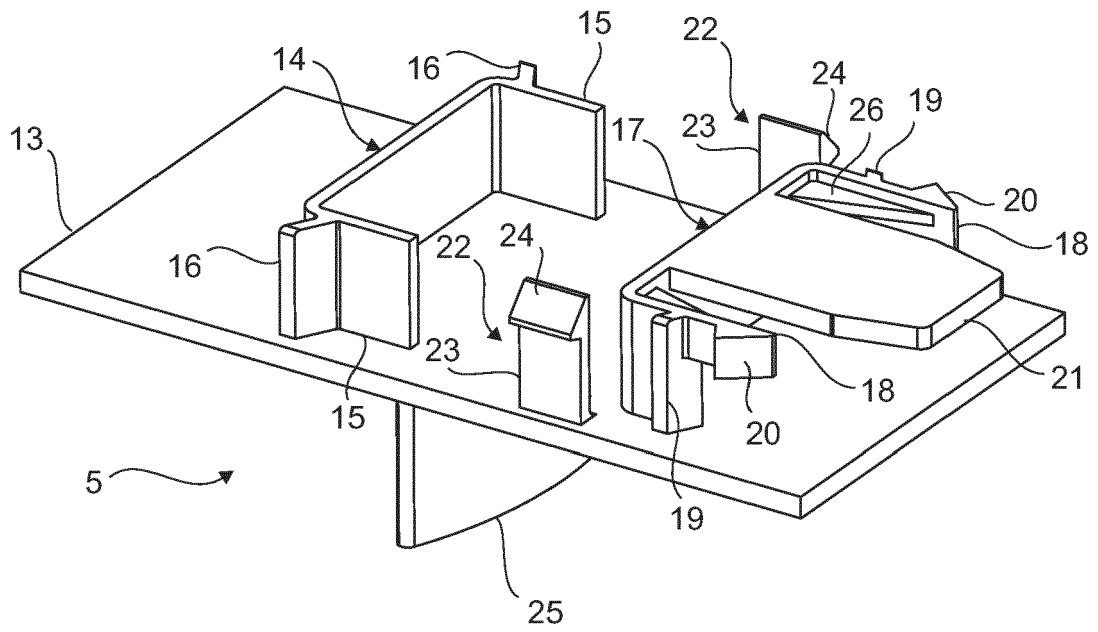


Figure 5

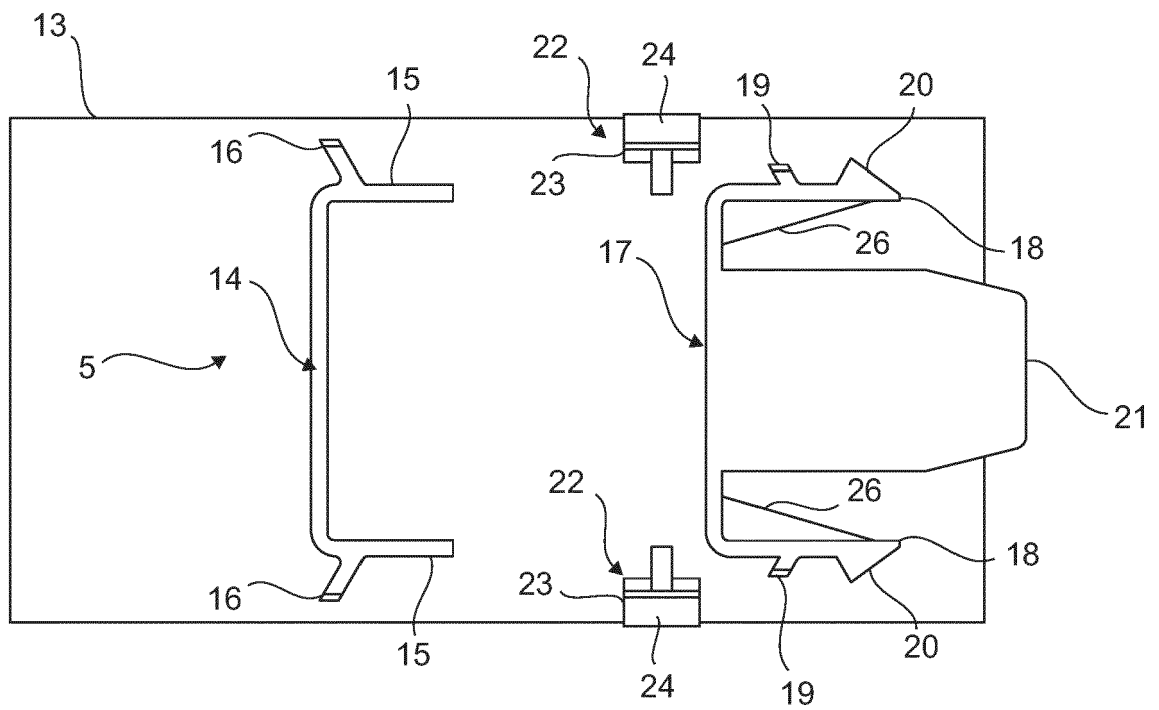


Figure 6

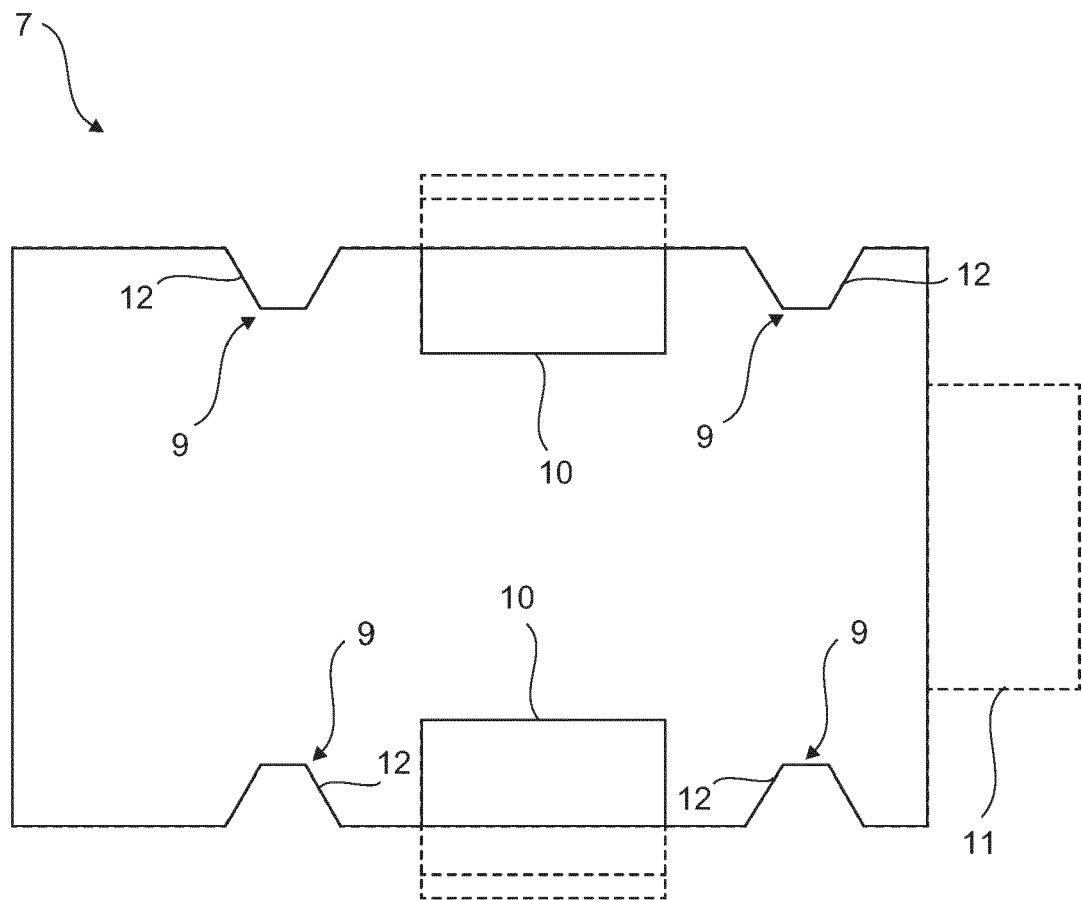


Figure 7

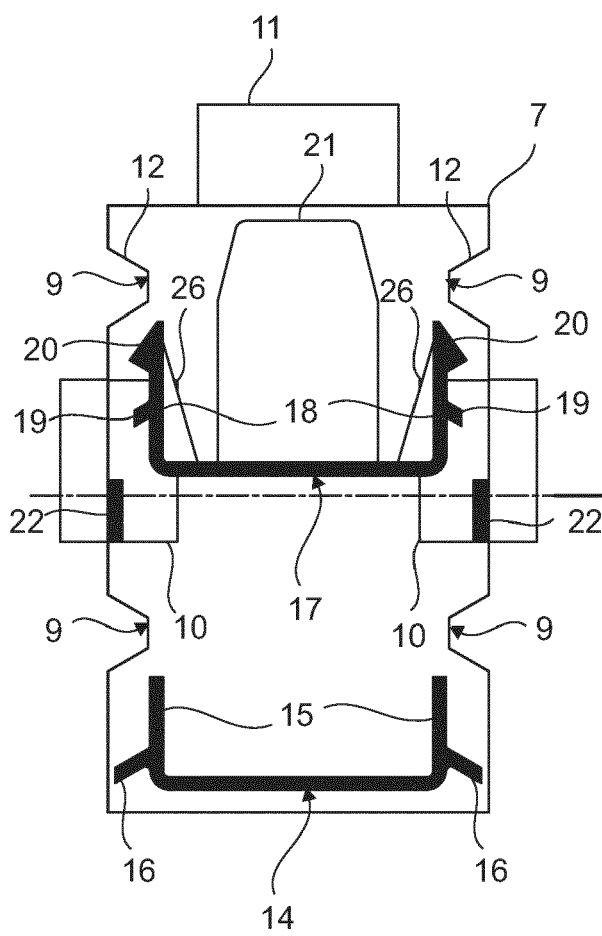


Figure 8

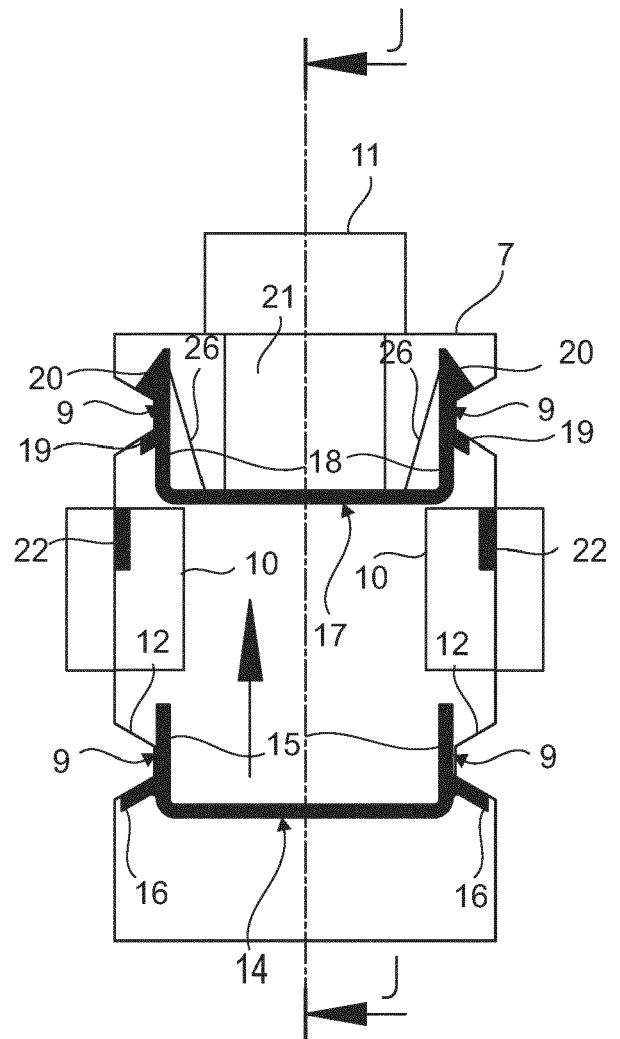
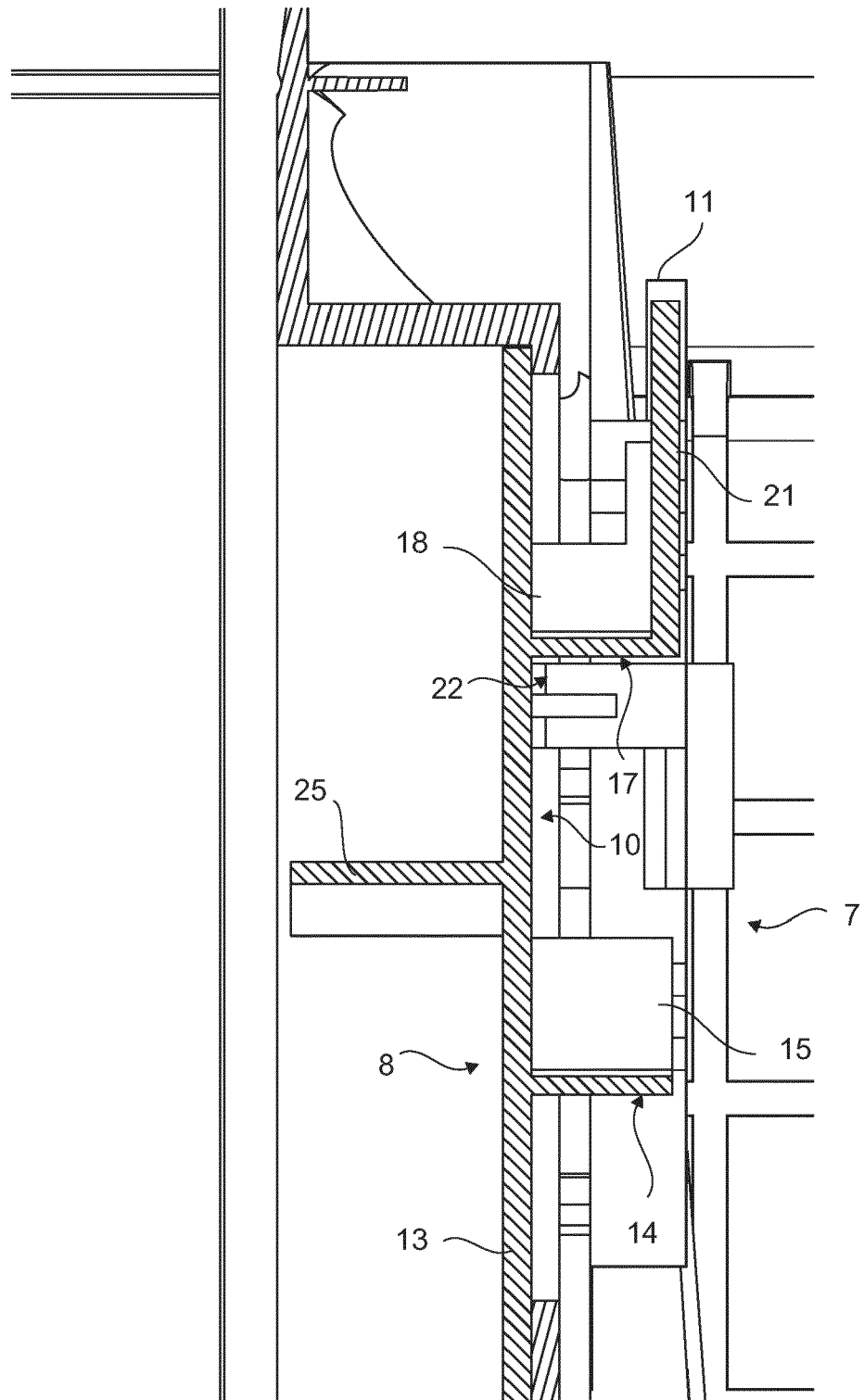


Figure 9





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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                          |                                  |                                         |
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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