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(54) **Household refigerator with internal lighting.**

(57) Household refrigerator with internal lighting, comprising an internal compartment (1) with a back wall (2) that comprises at least one lighting device (3), said lighting device (3) being disposed in a substantially vertical direction along at least part of said back wall (2). Said lighting device (3) comprises a column (4) fixed to the back wall (2) that delimits a front housing (5), and a lighting means (6) disposed on said front housing (5). Between the column (4) of the lighting device (3) and the back wall (2) there is at least one through-channel (7) through which a flow of cooling air circulates, and said column (4) comprises a plurality of side holes (8) that communicate said through-channel (7) with the internal compartment (1) of the refrigerator.

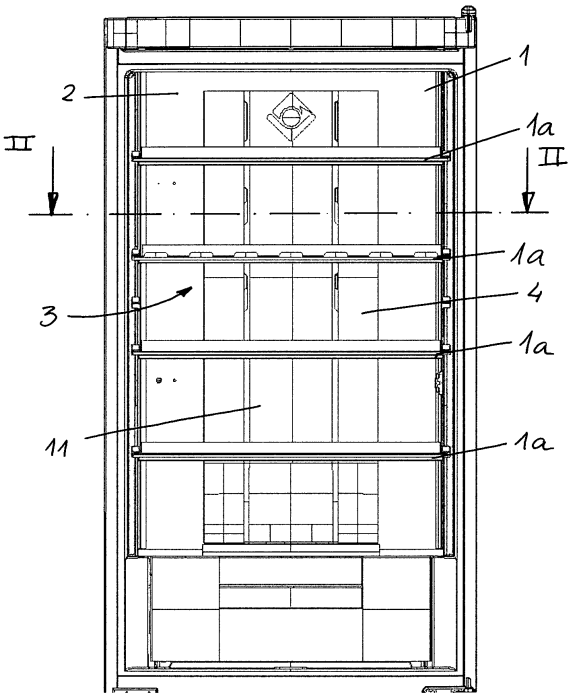


Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to a household refrigerator that comprises an internal lighting device.

PRIOR ART

[0002] Known household refrigerators comprise a lighting device for illuminating the internal compartment of the refrigerator. Said internal compartment comprises various shelves upon which food products are disposed, it being necessary to illuminate each of said shelves.

[0003] Some lighting devices known in the prior art are disposed on the side walls of the compartment, on the roof of said compartment or on the back wall. There are also known lighting devices that are disposed on the internal wall of the refrigerator door. Said lighting devices may comprise various lighting elements or a single lighting element that extends along most of a wall of the internal compartment. Another known solution involves disposing a lighting device on each shelf.

[0004] In the household refrigerators of the prior art, different types of light sources are used, e.g. light emitted through one or more series of LEDs, neon light, phosphorescent light, fluorescent light etc.

[0005] US 2004/0246716 A1 describes a household refrigerator that comprises an internal compartment with a back wall that comprises a lighting device, said lighting device being disposed in a vertical direction along said back wall. Said lighting device comprises a column fixed to the back wall that delimits a front housing, and a lighting means disposed in said front housing.

DISCLOSURE OF THE INVENTION

[0006] It is an object of the invention to provide a household refrigerator that comprises an internal lighting device as defined in the claims.

[0007] The household refrigerator of the invention comprises an internal compartment with a back wall that comprises at least one lighting device, said lighting device being disposed in a substantially vertical direction along at least part of said back wall. Said lighting device comprises a column fixed to the back wall that delimits a front housing, and a lighting means disposed in said front housing. Between the column of the lighting device and the back wall there is at least one through-channel through which a flow of cooling air circulates. Said column comprises a plurality of side holes that communicate said through-channel with the internal compartment of the refrigerator.

[0008] In the refrigerator of the invention, as well as illuminating each space corresponding to the different shelves, the internal lighting device also provides a passage for a flow of cooling air towards said spaces.

[0009] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed disclosure of the invention.

DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a partial front view of the refrigerator with the internal lighting device of the invention.

FIG. 2 is a cross-sectional view in detail of the refrigerator of FIG. 1 according to section II-II.

FIG. 3 is a perspective view of the internal lighting device of the refrigerator of FIG. 1.

FIG. 4 is an exploded view of the internal lighting device of the refrigerator of FIG. 1 with the insulating piece.

FIG. 5 is a perspective view of the lighting device of the refrigerator of FIG. 1 without the translucent panel, showing the lighting means fixed to the column.

FIG. 6 is a cross-sectional view in detail, showing a fixing hook hooked into a respective fixing hole.

FIG. 7 is a perspective view in detail of a fixing hook.

FIG. 8 is a perspective view in detail of a fixing hole.

DETAILED DISCLOSURE OF THE INVENTION

[0011] With reference to the embodiment shown in figure 1, the household refrigerator of the invention comprises an internal compartment 1 with a back wall 2 that comprises a lighting device 3, said lighting device 3 being disposed in a vertical direction along a substantial part of said back wall 2, in such a way that said lighting device 3 illuminates by itself the space corresponding to the different shelves 1a of the internal compartment 1 of the refrigerator. Said lighting device 3 comprises a column 4 fixed to the back wall 2 that delimits a front housing 5, and a lighting means 6 disposed in said front housing 5, as can be seen in figure 5. Between the column 4 of the lighting device 3 and the back wall 2 there is a through-channel 7 through which a flow of cooling air circulates, as shown in figure 2. Said column 4 comprises a plurality of side holes 8 that communicate said through-channel 7 of cooling air with the internal compartment 1 of the refrigerator.

[0012] Said through-channel 7 comprises a damper (not shown in the figures) disposed on a bottom end of said through-channel 7, which permits the passage of the flow of cooling air of the refrigeration circuit (not shown in the figures) towards said through-channel 7 when the temperature T of the internal compartment 1 exceeds a predetermined value T_d. The refrigerator com-

prises control means and a temperature sensor (not shown in the figures) disposed in the internal compartment 1, so that said control means control the opening of the damper in accordance with the information received from said temperature sensor and the predetermined temperature T_d.

[0013] In addition, and with reference to figure 2, the through-channel 7 is delimited by the back wall 2 and a piece 9 of insulating material, which is used to insulate the column 4 from the flow of cooling air. This prevents water from condensing due to the cooling of the column 4 as a consequence of said column 4 being in direct contact with said flow of cooling air. Said insulating piece 9 is made of expanded polystyrene and comprises holes 10 that communicate the through-channel 7 with the side holes 8 of the column 4. Said through-channel 7 extends along the entire length of the insulating piece 9.

[0014] With reference to figures 3 and 4, the lighting device 3 also comprises a translucent panel 11 that covers the front housing 5 of the column 4.

[0015] The translucent panel 11 and the column 4 overlap in respective overlapping areas As. Said translucent panel 11 comprises various fixing hooks 12 for fixing said translucent panel 11 to the column 4 through fixing holes 13 of the column 4, said fixing hooks 12 and said fixing holes 13 being disposed on the respective overlapping areas As of the translucent panel 11 and the column 4. Said overlapping areas As are disposed on both sides of the front housing 5 of the column 4.

[0016] The side holes 8 of the column 4 are disposed on both sides of the front housing 5, on the overlapping areas As of the column 4, as shown in figures 4 and 5.

[0017] With reference to figure 7, the fixing hook 12 comprises an inverted L-shape that comprises a vertical section 14 with a groove 15 that is hooked onto a projection 16 disposed on an internal surface 17 of the respective fixing hole 13, when the fixing hook 12 passes through the fixing hole 13, as shown in figure 6. This makes the lighting device 3 easy to take down, thus making it easier to carry out the corresponding maintenance operations of said lighting device 3, it being sufficient to take off the translucent panel 11 when the lighting means 6 has to be changed.

[0018] To ensure that the translucent panel 11 is fixed to the column 4 it is sufficient to dispose of two fixing hooks 12 in each overlapping area As of the translucent panel 11 and two respective fixing holes 13 in each overlapping area As of the column 4, as shown in figure 4.

[0019] With references to figures 1, 3 and 4, the translucent panel 11 comprises side narrowings 18 that leave the side holes 8 of the column 4 uncovered for the passage of the flow of cooling air towards the internal compartment 1.

[0020] With reference to figures 4 and 5, the lighting means 6 is tubular and is fixed at its ends 6a to the column 4. To achieve this, the front housing 5 of the column 4 comprises a top end 5a and a bottom end 5b which comprise a housing 19 with a front opening 19a for housing the respective ends 6a of the lighting means 6, with the result that the lighting means 6 are fixed in relation to the column 4 in a vertical direction. Said lighting means 6 emits, in a preferred embodiment, a fluorescent light.

[0021] The lighting means 6 comprises a hood 20 to cover each end 6a of said lighting means, the electrical connections (not shown in the figures) thus being insulated from the internal compartment 1. In addition, the front housing 5 comprises a top clip 21 and a bottom clip 22 which embrace the respective hood 20 of the lighting means 6. In this way the lighting means 6 is held in place, preventing each end 6a from coming out of its housing 19. Said hood 20 protects the ends 6a of the lighting means 6.

[0022] The column 4 is fixed to the back wall 2 of the refrigerator by fixing means. Said fixing means comprise three screws 23 disposed in the front housing 5 of the column 4, as shown in figure 4.

Claims

1. Household refrigerator with internal lighting, comprising an internal compartment (1) with a back wall (2) that comprises at least one lighting device (3), said lighting device (3) being disposed in a substantially vertical direction along at least a substantial part of said back wall (2), and the lighting device (3) comprising a column (4) fixed to the back wall (2) that delimits a front housing (5), and a lighting means (6) disposed in said front housing (5), **characterised in that** between the column (4) of the lighting device (3) and the back wall (2) there is at least one through-channel (7) through which a flow of cooling air circulates, and **in that** said column (4) comprises a plurality of side holes (8) that communicate said through-channel (7) with the internal compartment (1) of the refrigerator.

2. Household refrigerator according to the preceding claim, wherein the through-channel (7) is delimited by the back wall (2) and an insulating piece (9) disposed between said back wall (2) and the column (4).

3. Household refrigerator according to the preceding claim, wherein the insulating piece (9) comprises holes (10) that communicate the through-channel (7) with the side holes (8) of the column (4).

4. Household refrigerator according to any of the preceding claims, wherein the lighting device (3) comprises a translucent panel (11) that covers the front housing (5) of the column (4).

5. Household refrigerator according to the preceding claim, wherein the translucent panel (11) and the column (4) overlap in respective overlapping areas (As) and wherein said translucent panel (11) com-

prises various fixing hooks (12) for fixing said translucent panel (11) to the column (4) through fixing holes (13) on the column (4), said fixing hooks (12) and said fixing holes (13) being disposed on the respective overlapping areas (As) of the translucent panel (11) and of the column (4).

6. Household refrigerator according to the preceding claim, wherein the fixing hook (12) comprises an inverted L-shape that comprises a vertical section (14) with a groove (15) that is hooked onto a projection (16) disposed on an internal surface (17) of the respective fixing hole (13) when the fixing hook (12) passes through said fixing hole (13).

7. Household refrigerator according to any of claims 4 to 6, wherein the translucent panel (11) comprises side narrowings (18) that leave the side holes (8) of the column (4) uncovered for the passage of the flow of cooling air towards the internal compartment (1).

8. Household refrigerator according to any of the preceding claims, wherein the lighting means (6) is tubular and is fixed at its ends (6a) to the column (4).

9. Household refrigerator according to the preceding claim, wherein the front housing (5) of the column (4) comprises a top end (5a) and a bottom end (5b) which comprise a housing (19) with a front opening (19a) for housing the respective ends (6a) of the lighting means (6).

10. Household refrigerator according to any of claims 8 or 9, wherein each end (6a) of the lighting means (6) comprises a hood (20) and wherein the front housing (5) comprises a top clip (21) and a bottom clip (22) which embrace the respective hood (20) of the lighting means (6).

11. Household refrigerator according to any of the preceding claims, wherein the side holes (8) of the column (4) are disposed on both sides of the front housing (5).

12. Household refrigerator according to any of the preceding claims, wherein the column (4) is fixed to the back wall (2) through fixing means disposed on the front housing (5).

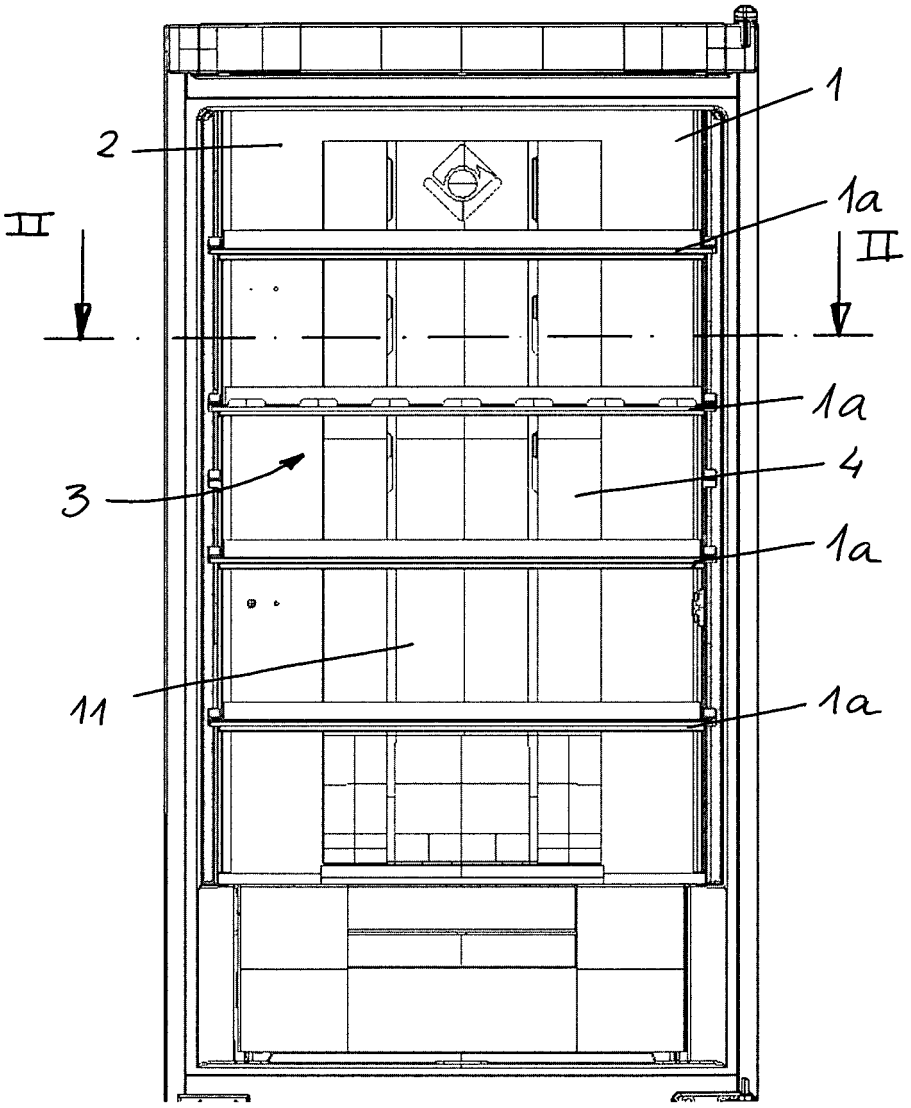


Fig. 1

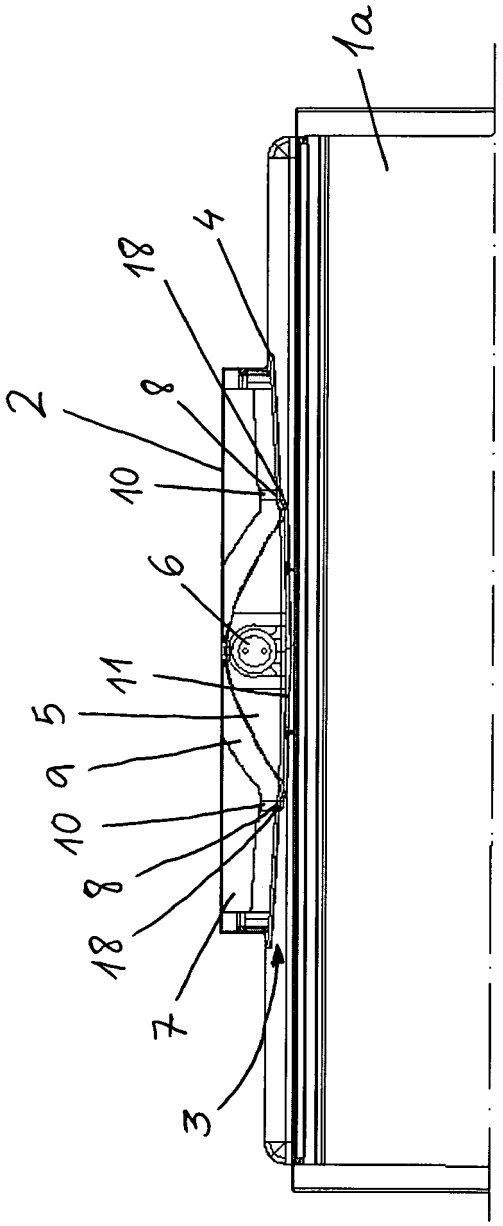


Fig. 2

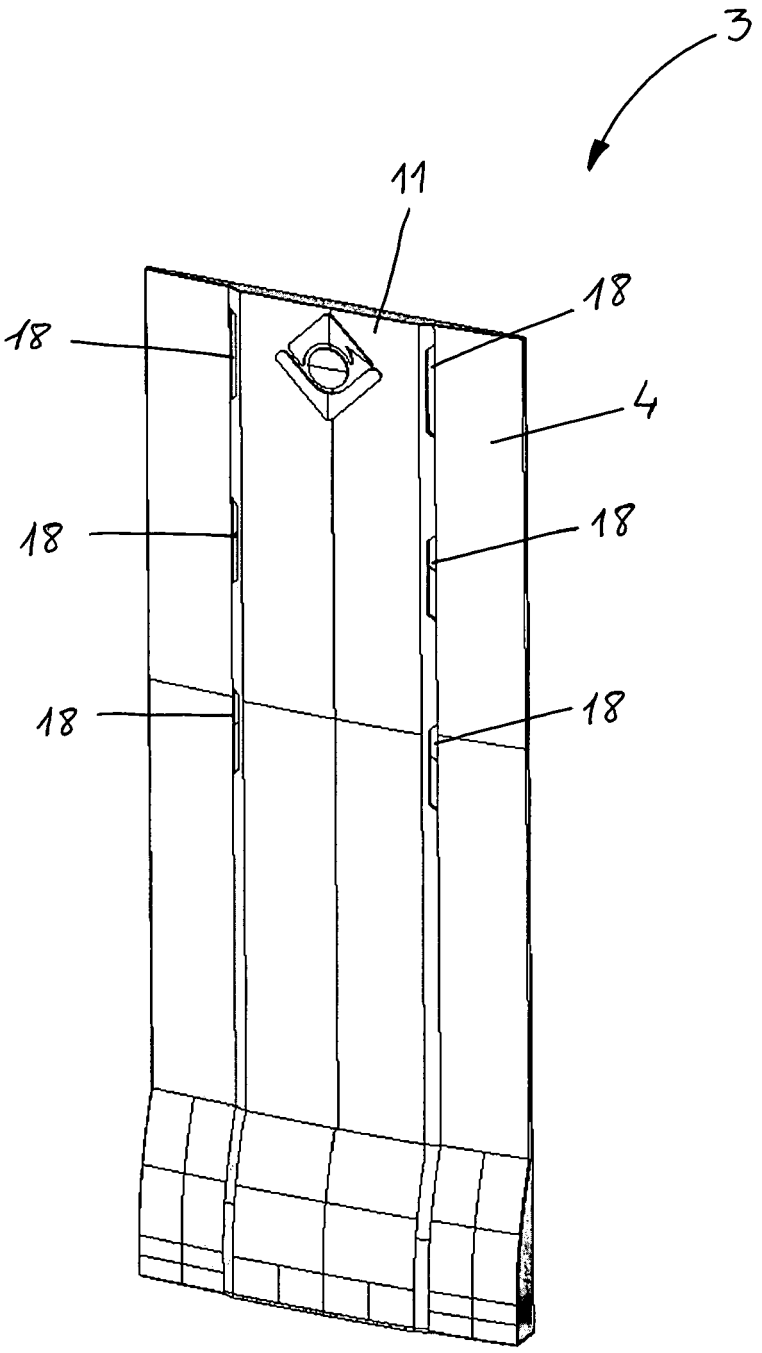


Fig. 3

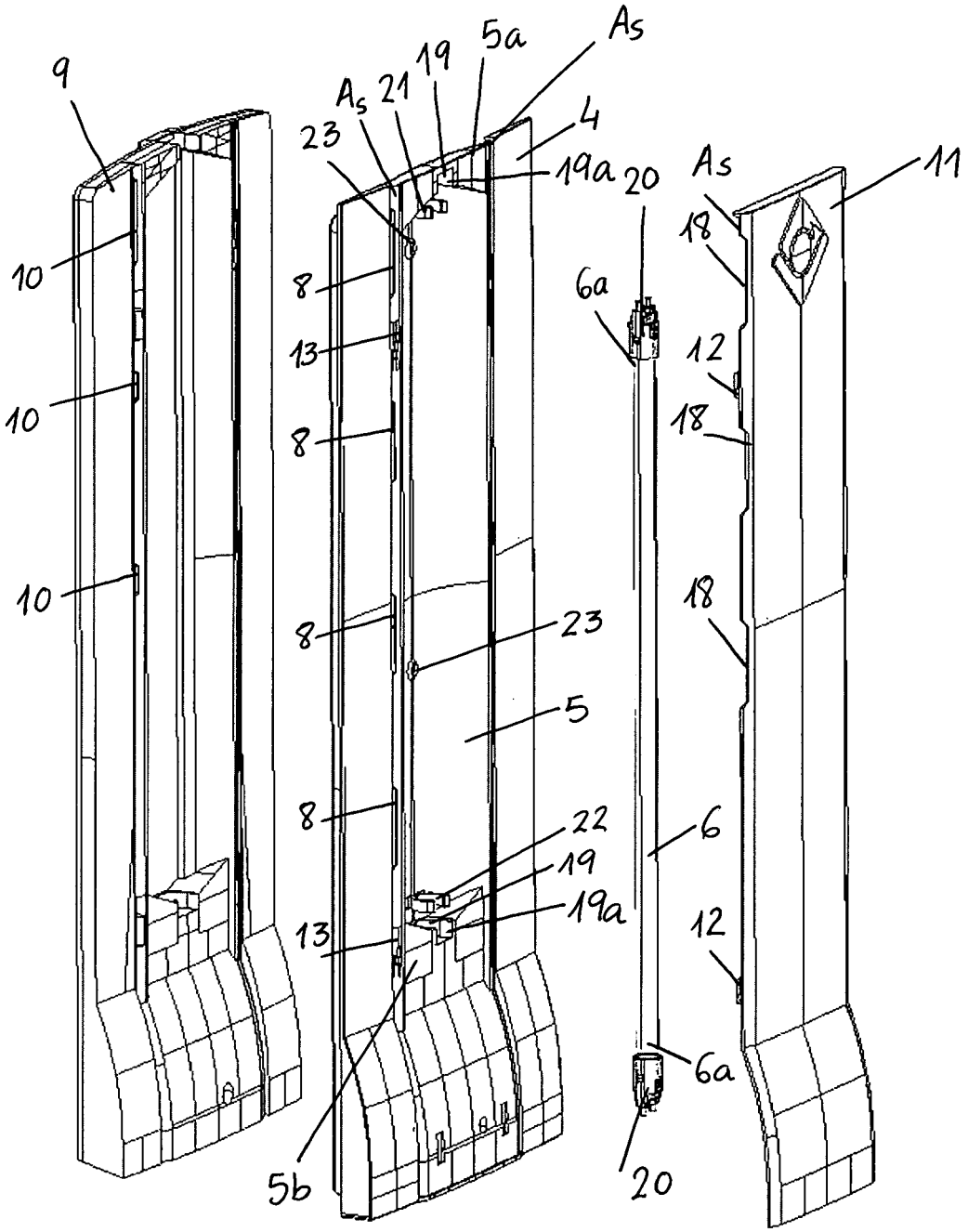

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Fig. 4

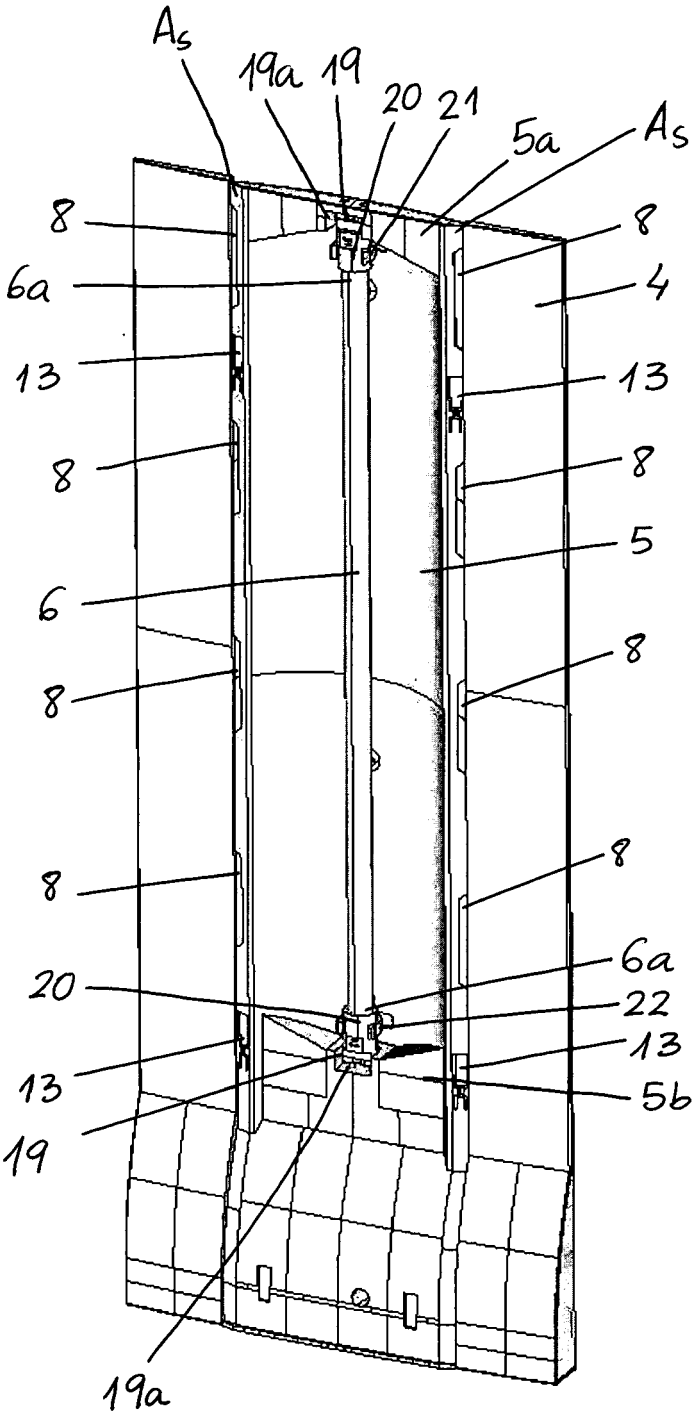


Fig. 5

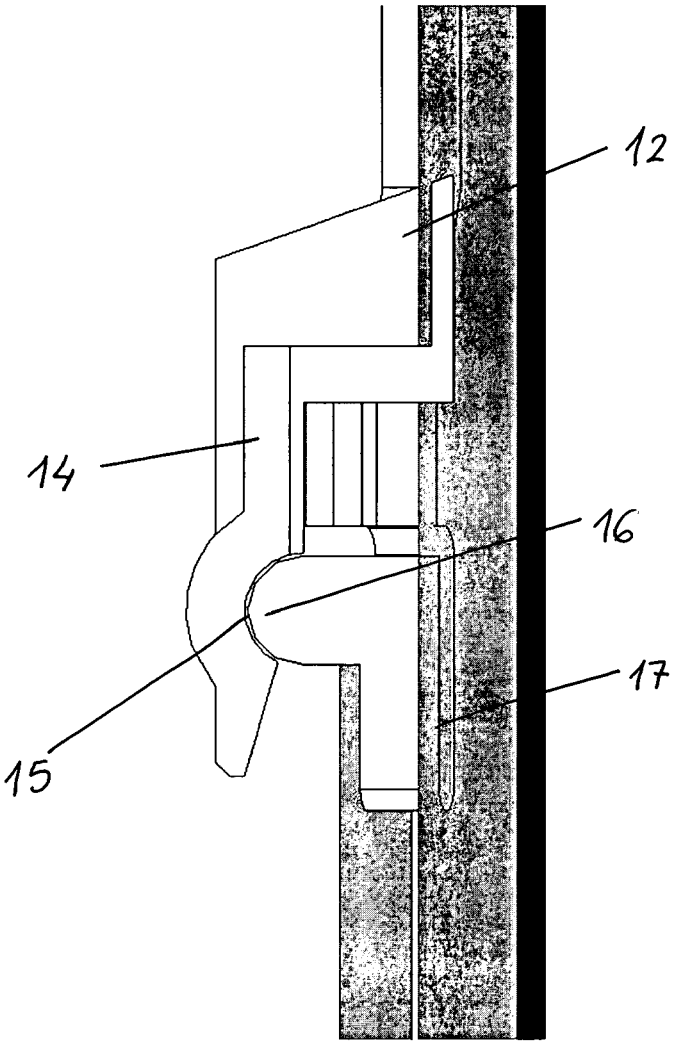


Fig. 6

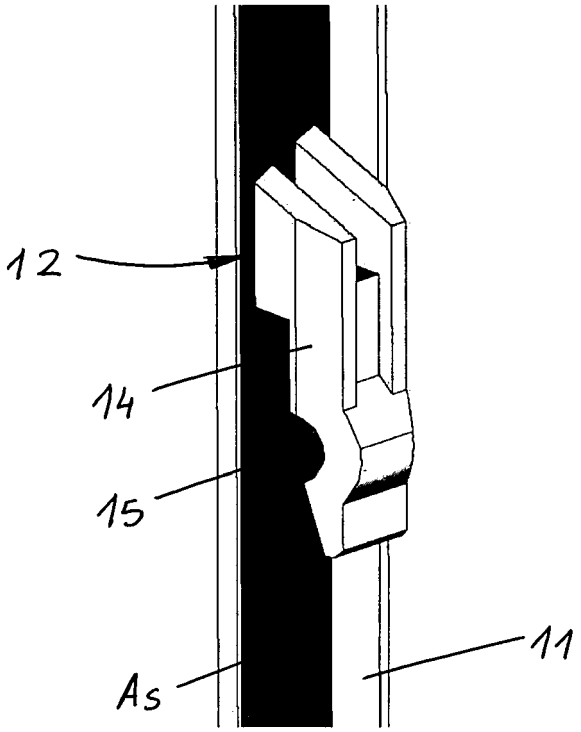


Fig. 7

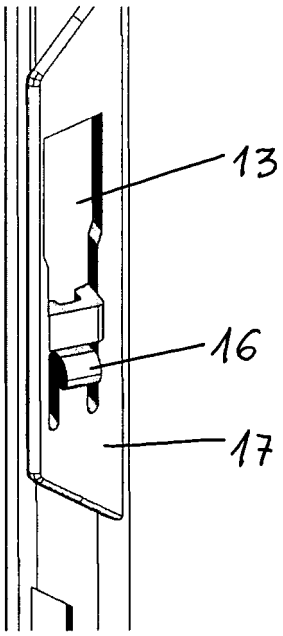


Fig.8

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Application Number
EP 07 38 0122

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 February 2008	Salaün, Eric

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