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(54) **REFRIGERATOR AIR-CHANNEL AIR SUPPLY VOLUME ADJUSTABLE STRUCTURE AND REFRIGERATOR**

(57) A refrigerator air-duct air supply volume adjustable structure comprises: an air duct plate (1) provided with an air outlet (11), a sliding adjustment plate (2) and a sliding baffle (3). An inclined slideway (21) is provided on one side of the sliding adjustment plate (2), and a poking block (22) protruding outwards is provided on the other side of the sliding adjustment plate (2). A pair of sliding chutes (14) vertically opposite to each other are formed in the rear side of the air duct plate (1). The sliding baffle (3) is located in the pair of sliding chutes (14), and a guide pillar (4) is fixedly provided on the side, opposite

to the sliding adjustment plate (2), of the sliding baffle (3). The sliding baffle (3) is slidably connected with the slideway (21) by means of the guide pillar (4). A poking hole (12) formed in the horizontal direction is provided on the air duct plate (1). The poking block (22) is configured to penetrate out of the poking hole (12). The sliding adjustment plate (2) is driven to horizontally slide towards to the left and right by poking the poking block (22), and thus the sliding baffle (3) is driven to slide upwards and downwards along the air outlet to adjust the size of the air outlet.

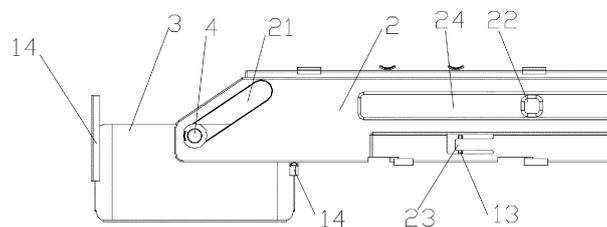


Fig. 1

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Description

CROSS-REFERENCE TO RELATED DISCLOSURE

[0001] The present application claims priority to Chinese Patent Disclosure No. 2017103578411, filed on May 19, 2017, entitled "Refrigerator Air-duct Air Supply Volume Adjustable Structure and Refrigerator", the disclosure of which is incorporated herein by reference in its entirety.

FIELD OF TECHNOLOGY

[0002] The present disclosure relates to the field of refrigerator technologies, and in particular to a refrigerator air-duct air supply volume adjustable structure and a refrigerator.

BACKGROUND

[0003] Air duct is one of the core components of an air-cooled refrigerator. For a single-system dual-compartment refrigerator or a dual-system three-compartment refrigerator, an electric damper is usually used to control the air supply volume of one compartment. Generally speaking, the electric damper only has an opening state and a closing state. Although this kind of control method can control the air supply volume, the cost of the electric damper is high, and the components and parts in cooperation with the electric damper have complicated structures and wrapped internally, the selling point is not obvious.

SUMMARY

(I) Technical problems to be solved

[0004] One objective of the present disclosure is to provide a refrigerator air-duct air supply volume adjustable structure capable of adjusting the air volume of a compartment and achieving the human-machine interaction.

[0005] Another objective of the present disclosure is to provide a refrigerator having the refrigerator air-duct air supply volume adjustable structure above.

Technical solutions

[0006] In order to solve the technical problems above, the present disclosure provides a refrigerator air-duct air supply volume adjustable structure, including an air duct plate provided with an air outlet, the structure further includes a sliding adjustment plate and a sliding baffle; an inclined slideway is provided on one side of the sliding adjustment plate, and a poking block protruding outwards is provided on the other side of the sliding adjustment plate; a pair of sliding chutes vertically opposite to each other are formed in a rear side of the air duct plate, the sliding

baffle is located in the pair of sliding chutes, and a guide pillar is fixedly provided on a side, opposite to the sliding adjustment plate, of the sliding baffle; wherein the sliding baffle is slidably connected with the slideway by means of the guide pillar;

a poking hole arranged in the horizontal direction is provided on the air duct plate; wherein the poking block is configured to penetrate out of the poking hole, and the sliding adjustment plate is driven to horizontally slide towards to the left and right by poking the poking block, so that the sliding baffle is driven to slide upwards and downwards along the air outlet to adjust the size of the air outlet.

[0007] In an embodiment of the present disclosure, the slideway is an oblong hole inclined from bottom to top from one end of the sliding adjustment plate.

[0008] In an embodiment of the present disclosure, the guide pillar penetrates out of the oblong hole, and a penetrating end of the guide pillar is engaged by an engaging member.

[0009] In an embodiment of the present disclosure, a side facing the air duct plate of the sliding adjustment plate is provided with a snap-fit, the air duct plate is provided with a plurality of slots disposed at intervals, and the position limitation is achieved when the snap-fit is clipped into the slots.

[0010] In an embodiment of the present disclosure, three slots are provided corresponding to movement states of the sliding baffle such that the air outlet is fully opened, the air outlet is half opened and the air outlet is fully closed.

[0011] In an embodiment of the present disclosure, a concave groove concavely recessed is provided at a position where the poking block is provided on the sliding adjustment plate, and the poking block is fixedly arranged in the concave groove.

[0012] In an embodiment of the present disclosure, the poking block and the concave groove are integrally formed.

[0013] In an embodiment of the present disclosure, the poking hole is an oblong hole, and the concave groove is disposed opposite to the poking hole.

[0014] The present disclosure further provides a refrigerator, including the refrigerator air-duct air supply volume adjustable structure above.

Beneficial effects

[0015] Compared to the prior art, the present disclosure has at least the following advantages:

The present disclosure provides a refrigerator air-duct air supply volume adjustable structure and a refrigerator, wherein, the refrigerator air-duct air supply volume adjustable structure includes an air duct plate, a sliding adjustment plate and a sliding baffle. An inclined slideway is provided on one side of the sliding adjustment plate, and a poking block protruding outwards is provided on the other side of the sliding adjustment plate; a pair of

sliding chutes vertically opposite to each other are formed in a rear side of the air duct plate, the sliding baffle is located in the pair of sliding chutes, and a guide pillar is fixedly provided on a side, opposite to the sliding adjustment plate, of the sliding baffle; the sliding baffle is slidably connected with the slideway by means of the guide pillar; a poking hole arranged in the horizontal direction is provided on the air duct plate, and the poking block is configured to penetrate out of the poking hole; the sliding adjustment plate is driven to horizontally slide towards to the left and right by poking the poking block, so that the sliding baffle is driven to slide upwards and downwards along the air outlet to adjust the size of the air outlet, thereby achieving both the manual control of the air volume of the compartment of the refrigerator and the human-machine interaction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a schematic diagram showing the connection relations of the main movement mechanisms of a refrigerator air-duct air supply volume adjustable structure according to an embodiment of the present disclosure;

Fig. 2 is a front schematic view showing the closed air outlet according to an embodiment of the present disclosure;

Fig. 3 is a rear schematic view showing the closed air outlet according to an embodiment of the present disclosure;

Fig. 4 is a front schematic view showing the half opened air outlet according to an embodiment of the present disclosure;

Fig. 5 is a rear schematic view showing the half opened air outlet according to an embodiment of the present disclosure;

Fig. 6 is a front schematic view showing the fully opened air outlet according to an embodiment of the present disclosure;

Fig. 7 is a rear schematic view showing the fully opened air outlet according to an embodiment of the present disclosure;

Description of the reference numbers

1 air duct plate	11 air outlet
12 poking hole	13 slot
14 sliding chute	2 sliding adjustment plate
21 slideway	22 poking block

(continued)

23 snap-fit	24 concave groove
3 sliding baffle	4 guide pillar

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DETAILED DESCRIPTION

[0017] Hereinafter, the specific implementations of the present disclosure will be further described in detail with reference to the accompanying drawings and embodiments. The following embodiments are used to illustrate the present disclosure, but are not intended to limit the scope thereof.

[0018] It should be noted that, in the description of the present disclosure, the orientation or position relations indicated by the terms "center", "longitudinal", "lateral", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer" and etc. are based on the orientation or position relations shown in the drawings, which is merely for the convenience of describing the present disclosure and simplifying the description, and is not to indicate or imply that the device or component referred to must have a specific orientation or be provided and operated in a specific orientation. Therefore, it cannot be construed as limiting the present disclosure.

[0019] In the description of the present disclosure, it should be noted that unless specifically defined or limited, the terms "mounted", "connect to", and "connect with" should be understood in a broad sense, for example, they may be fixed connections, removable connections, or integrated connections; they may be mechanical connections or electrical connections; they may also be direct connections, indirect connections through intermediate mediums, or internal connection of two components. For a person of ordinary skill in the art, the specific meanings of the terms above in the present disclosure can be understood according to specific situations.

[0020] In addition, unless specified otherwise, "multiple", "a plurality of" and "a plurality of sets" means two or more in the description of the present disclosure.

[0021] As shown in Figs. 1-7, the refrigerator air-duct air supply volume adjustable structure provided by the present disclosure includes an air duct plate 1 provided with an air outlet 11, and further including a sliding adjustment plate 2 and a sliding baffle 3.

[0022] As shown in Fig. 1, an inclined slideway 21 is provided on one side of the sliding adjustment plate 2, and correspondingly, the corner above the slideway 21 of the sliding adjustment plate 2 is configured as a slope having the same inclining direction with that of the slideway 21; a poking block 22 protruding outwards is provided on the other side of the sliding adjustment plate 2.

[0023] A pair of sliding chutes 14 vertically opposite to each other are formed in the rear side of the air duct plate 1. The sliding baffle 3 is located in the pair of sliding chutes 14, for limiting the sliding direction of the sliding baffle 3, and a guide pillar 4 is fixedly provided on the

side, opposite to the sliding adjustment plate 2, of the sliding baffle 3. The sliding baffle 3 is slidably connected with the slideway 21 by means of the guide pillar 4. In order to prevent the guide pillar 4 from disengaging the slideway 21 during movement, an anti-disengaging structure may be provided at the end portion of the guide pillar 4.

[0024] A poking hole 12 formed in the horizontal direction is provided on the air duct plate 1. The poking block 22 is configured to penetrate out of the poking hole 12, wherein the length of the poking hole 12 is greater than the diameter of the poking block 22, thereby facilitating poking the poking block 22. The sliding adjustment plate 2 is driven to horizontally slide towards to the left and right by poking the poking block 22, so that the sliding baffle 3 slides obliquely along the slideway 21 and slides upwards and downwards along the sliding chutes 14, thus the sliding baffle 3 is driven to slide upwards and downwards along the air outlet 11 to adjust the air outlet volume of the air outlet 11. The adjustment of the air outlet 11 of the present disclosure is completely achieved by the cooperation between mechanically structural members, the advantages of simple structure, low cost and reliable operation are achieved, the air volume of the compartment can be manually controlled, and the selling point is manifested.

[0025] In the embodiments of the present disclosure, as shown in Fig. 1, the slideway 21 is an oblong hole inclined from the bottom to the top from one end of the sliding adjustment plate 2; the guide pillar 4 penetrates out of the oblong hole, and the penetrating end of the guide pillar 4 is engaged by an engaging member to prevent the guide pillar 4 from disengaging the oblong hole, and to ensure that the guide pillar 4 drives the sliding baffle 3 to slide steadily with a suitable length. The engaging member can be a snap spring.

[0026] In the embodiments of the present disclosure, the side facing the air duct plate 1 of the sliding adjustment plate 2 is provided with a snap-fit 23, the end portion of the snap-fit 23 is a tip end or a hook-shaped end. The air duct plate 1 is provided with a plurality of slots disposed at intervals, i.e., corresponding to a plurality of adjustment gears. The arrangement direction of the slots 13 is the moving direction of the sliding adjustment plate 2, and the position limitation is achieved when the snap-fit 23 is clipped into the slots 13, so that when the poking block 22 is poked, the hand feeling of the operator can be enhanced, and the operating gear can be perceived in real time.

[0027] In the embodiments of the present disclosure, three slots 13 are provided corresponding to movement states of the sliding baffle 3 such that the air outlet 11 is fully opened, the air outlet 11 is half opened and the air outlet 11 is fully closed. As shown in Figs. 2-7, in the case that the air outlet 11 is fully closed in Fig. 2 and Fig. 3, the snap-fit 23 stops at the first slot 13. The poking block 22 is pushed towards the right by 20mm, and the guide pillar 4 of the sliding baffle 3 moves upwards along the

slideway 21 by 13.5mm, at this time the air outlet 11 is half opened and the snap-fit 23 is pushed to the second slot 13, as shown in Figs. 4 and 5. The poking block 22 is pushed continuously towards the right by 20mm, and the guide pillar 4 of the sliding baffle 3 moves up continuously along the slideway 21 by 13.5mm, so that the air outlet 11 is fully opened and the snap-fit 23 is pushed to the third slot 13, as shown in Fig. 6 and Fig. 7.

[0028] In the embodiments of the present disclosure, in order to facilitate the arrangement of the poking block 22, a concave groove 24 concavely recessed is provided at the position where the poking block 22 is provided on the sliding adjustment plate 2. The concave groove 24 is horizontally arranged, and the poking block 22 is fixedly arranged in the concave groove 24. Specifically, the poking block 22 and the concave groove 24 are integrally formed.

[0029] As shown in Figs. 2, 4 and 6, the poking hole 12 is an oblong hole corresponding to the adjustable length of the poking block 22. The concave groove 24 is disposed opposite to the poking hole 12, and providing the concave groove 24 can reduce the friction between the sliding adjustment plate 2 and the air duct plate 1 when the poking block 22 is poked.

[0030] The present disclosure further provides a refrigerator, including the refrigerator air-duct air supply volume adjustable structure above. The compartment air supply volume of the refrigerator is adjustable, which is convenient in use.

[0031] According to the embodiments above that, the present disclosure provides the size-adjustment of the air outlet by the cooperation between mechanically structural members, and achieves both the manual control of the air inlet volume of the compartment of the refrigerator and the human-machine interaction.

[0032] The descriptions above are only preferred embodiments of the present disclosure, and are not intended to limit the present disclosure. Any modification, equivalent replacement and improvement made within the spirit and principle of the present disclosure shall be within the protection scope of the present disclosure.

Claims

1. A refrigerator air-duct air supply volume adjustable structure, comprising an air duct plate provided with an air outlet, **characterized in that**, the structure further comprises a sliding adjustment plate and a sliding baffle;
 - an inclined slideway is provided on one side of the sliding adjustment plate, and a poking block protruding outwards is provided on the other side of the sliding adjustment plate;
 - a pair of sliding chutes vertically opposite to each other is formed in a rear side of the air duct plate, the sliding baffle is located in the pair of sliding chutes, and a guide pillar is fixedly provided on a

side, opposite to the sliding adjustment plate, of the sliding baffle; wherein the sliding baffle is slidably connected with the slideway by means of the guide pillar; and

a poking hole arranged in the horizontal direction is provided on the air duct plate; wherein the poking block is configured to penetrate out of the poking hole, and the sliding adjustment plate is driven to horizontally slide towards to the left and right by poking the poking block, so that the sliding baffle is driven to slide upwards and downwards along the air outlet to adjust the size of the air outlet.

ture of any of claims 1 to 8.

2. The refrigerator air-duct air supply volume adjustable structure of claim 1, **characterized in that**, the slideway is an oblong hole inclined from bottom to top from one end of the sliding adjustment plate. 5
3. The refrigerator air-duct air supply volume adjustable structure of claim 2, **characterized in that**, the guide pillar penetrates out of the oblong hole, and a penetrating end of the guide pillar is engaged by an engaging member. 10
4. The refrigerator air-duct air supply volume adjustable structure of claim 1, **characterized in that**, a side facing the air duct plate of the sliding adjustment plate is provided with a snap-fit, the air duct plate is provided with a plurality of slots disposed at intervals, and the position limitation is achieved when the snap-fit is clipped into the slots. 15
5. The refrigerator air-duct air supply volume adjustable structure of claim 4, **characterized in that**, three slots are provided corresponding movement states of the sliding baffle such that the air outlet is fully opened, the air outlet is half opened and the air outlet is fully closed. 20
6. The refrigerator air-duct air supply volume adjustable structure of claim 1, **characterized in that**, a concave groove is provided at a position where the poking block is provided on the sliding adjustment plate, and the poking block is fixedly arranged in the concave groove. 25
7. The refrigerator air-duct air supply volume adjustable structure of claim 6, **characterized in that**, the poking block and the concave groove are integrally formed. 30
8. The refrigerator air-duct air supply volume adjustable structure of claim 7, **characterized in that**, the poking hole is an oblong hole, and the concave groove is disposed opposite to the poking hole. 35
9. A refrigerator, **characterized in** comprising the refrigerator air-duct air supply volume adjustable struc- 40

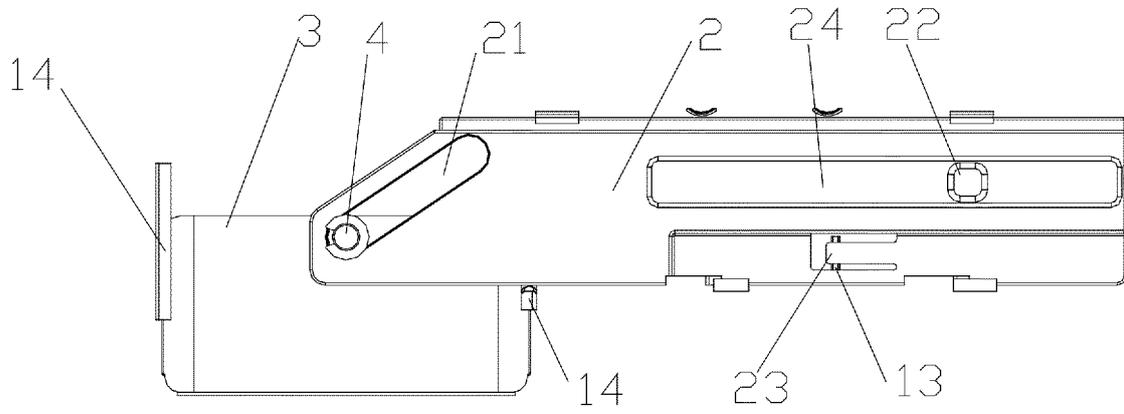


Fig. 1

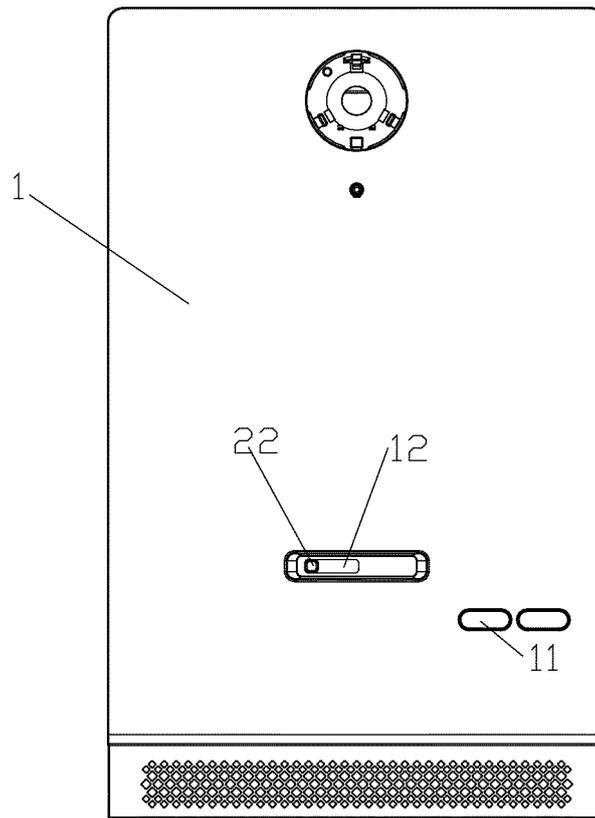


Fig. 2

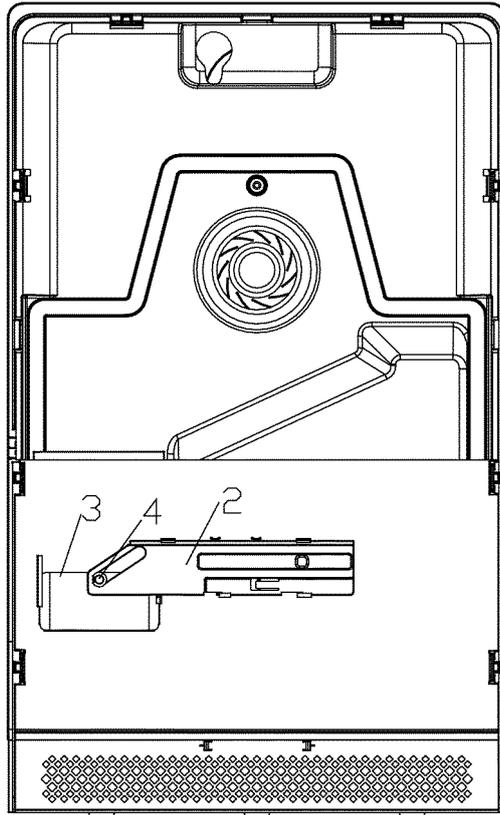


Fig. 3

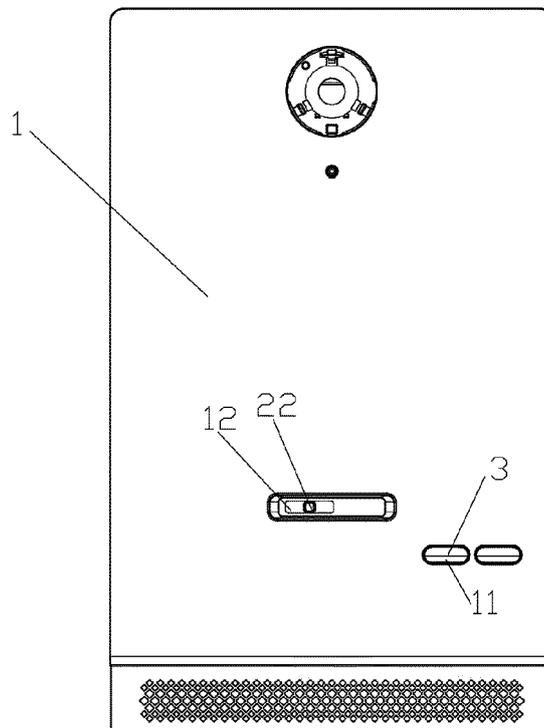


Fig. 4

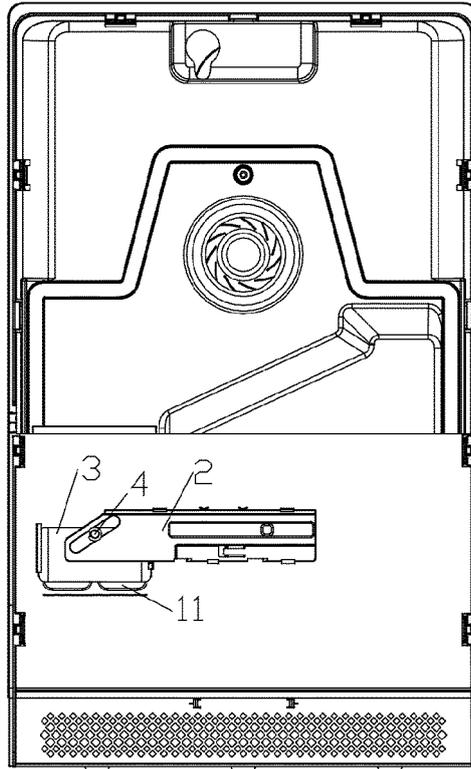


Fig. 5

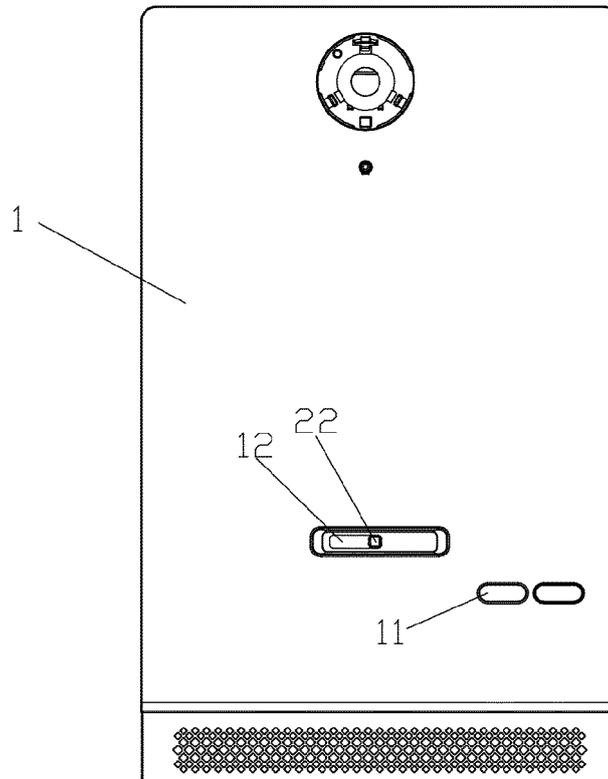


Fig. 6

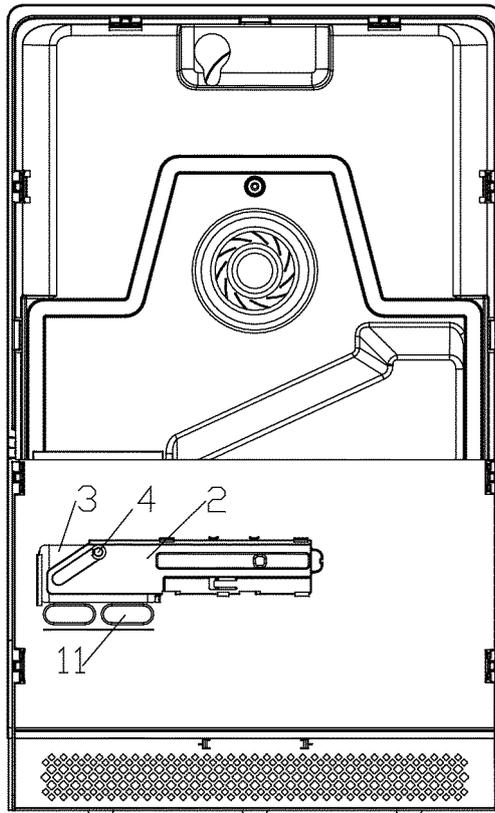


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/113407

A. CLASSIFICATION OF SUBJECT MATTER

F25D 17/04 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25D; F25C; F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC, CNABS, CNKI, CNTXT: 冰箱, 风门, 槽, 调节, 风量, 倾斜, 挡板; REFRIGERATOR, AIR, CONTROL, GATE, PLATE, BAFFLE, GROOVE, SLIDE, AMOUNT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 107178953 A (HEFEI HUALING CO., LTD. et al.), 19 September 2017 (19.09.2017), claims	1-9
Y	CN 105371564 A (QINGDAO HAIER CO., LTD.), 02 March 2016 (02.03.2016), description, pages 2 and 3, and figures 1 and 2	1-9
Y	CN 105222457 A (QINGDAO HAIER CO., LTD.), 06 January 2016 (06.01.2016), description, pages 2 and 3, and figures 1-4	1-9
A	CN 204478637 U (GUANGDONG HOMA APPLIANCES CO., LTD.), 15 July 2015 (15.07.2015), entire document	1-9
A	CN 201251338 Y (HISENSE KELON ELECTRICAL APPLIANCE CO., LTD. et al.), 03 June 2009 (03.06.2009), entire document	1-9
A	CN 105890266 A (SUZHOU SAMSUNG ELECTRONICS CO., LTD. et al.), 24 August 2016 (24.08.2016), entire document	1-9
A	CN 104075520 A (HEFEI HUALING CO., LTD.), 01 October 2014 (01.10.2014), entire document	1-9
A	CN 101153761 A (HAIER ELECTRONICS GROUP CO., LTD. et al.), 02 April 2008 (02.04.2008), entire document	1-9

 Further documents are listed in the continuation of Box C.
 See patent family annex.

* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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“P” document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 14 February 2018	Date of mailing of the international search report 08 March 2018
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer ZHANG, Xudong Telephone No. (86-10) 62084963

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/113407

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 204027134 U (HEFEI HUALING CO., LTD.), 17 December 2014 (17.12.2014), entire document	1-9

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/113407

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CN 105371564 A	02 March 2016	CN 105371564 B	01 December 2017
		WO 2017084332 A1	26 May 2017
CN 105222457 A	06 January 2016	WO 2017067186 A1	27 April 2017
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CN 204027134 U	17 December 2014	None	

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