

**(12) STANDARD PATENT**  
**(19) AUSTRALIAN PATENT OFFICE**

(11) Application No. **AU 2018245359 B2**

(54) Title  
**Indoor unit for air conditioning device**

(51) International Patent Classification(s)  
**F24F 13/22** (2006.01)

(21) Application No: **2018245359**

(22) Date of Filing: **2018.03.07**

(87) WIPO No: **WO18/180321**

(30) Priority Data

(31) Number  
**2017-070984**

(32) Date  
**2017.03.31**

(33) Country  
**JP**

(43) Publication Date: **2018.10.04**

(44) Accepted Journal Date: **2020.04.30**

(71) Applicant(s)  
**Mitsubishi Heavy Industries Thermal Systems, Ltd.**

(72) Inventor(s)  
**Uno, Naomichi;Mori, Hironori;Takano, Masashi;Kanamori, Azusa**

(74) Agent / Attorney  
**Phillips Ormonde Fitzpatrick, PO Box 323, Collins Street West, VIC, 8007, AU**

(56) Related Art  
**JP H06257778 A**  
**JP 2010249466 A**

(12) 特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関  
国際事務局

(43) 国際公開日  
2018年10月4日(04.10.2018)



(10) 国際公開番号

WO 2018/180321 A1

(51) 国際特許分類:  
F24F 13/22 (2006.01)

(21) 国際出願番号: PCT/JP2018/008862

(22) 国際出願日: 2018年3月7日(07.03.2018)

(25) 国際出願の言語: 日本語

(26) 国際公開の言語: 日本語

(30) 優先権データ:  
特願 2017-070984 2017年3月31日(31.03.2017) JP

(71) 出願人: 三菱重工サーマルシステムズ株式会社 (MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.) [JP/JP]; 〒1088215 東京都港区港南二丁目16番5号 Tokyo (JP).

(72) 発明者: 宇野 順道 (UNO, Naomichi); 〒1088215 東京都港区港南二丁目16番5号 三菱重工サーマルシステムズ株式会社内 Tokyo (JP). 森 裕典 (MORI, Hironori); 〒1088215 東京都港区港南二丁目16番5号 三菱重工サーマルシステムズ株式会社内 Tokyo (JP). ▲高▼野

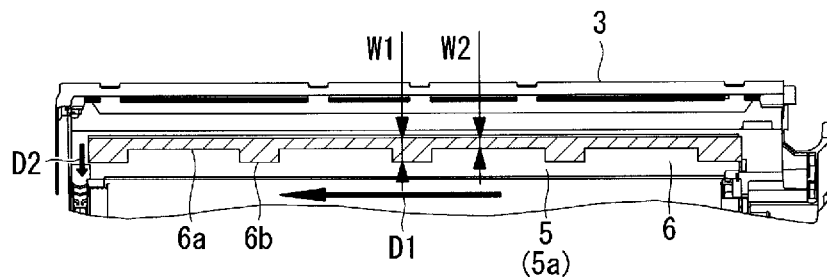
雅司 (TAKANO, Masashi); 〒1088215 東京都港区港南二丁目16番5号 三菱重工サーマルシステムズ株式会社内 Tokyo (JP). 金森 梓 (KANAMORI, Azusa); 〒1088215 東京都港区港南二丁目16番5号 三菱重工サーマルシステムズ株式会社内 Tokyo (JP).

(74) 代理人: 藤田 考晴 (FUJITA, Takaharu); 〒2208137 神奈川県横浜市西区みなとみらい2-2-1 横浜ランドマークタワー37F Kanagawa (JP).

(81) 指定国(表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL,

(54) Title: INDOOR UNIT FOR AIR CONDITIONING DEVICE

(54) 発明の名称: 空気調和装置の室内機



(57) Abstract: Provided is an indoor unit for an air conditioning device, the indoor unit being provided with: a water flow passage (5) for receiving water dripping from an indoor heat exchanger; and a drain pan (7) for receiving water conducted from the water flow passage (5). The entire water flow passage (5) is tilted to one side thereof in a longitudinal direction (D1) and has a bottom surface (5a), the whole of which is tilted (5a) to one side thereof in a width direction (D2) perpendicular to the longitudinal direction (D1). The bottom surface (5a) is located below an installation surface (6) on which the lower end of the indoor heat exchanger is mounted. The installation surface (6) has, in the longitudinal direction (D1): a recess (6a), the dimension of which in the width direction (D2) decreases; and a protrusion (6b), the dimension of which in the width direction (D2) increases. An air flow blocking member is provided between the installation surface (6) and the lower surface of the indoor heat exchanger.

SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) 指定国(表示のない限り、全ての種類の広域保護が可能): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), ユーラシア (AM, AZ, BY, KG, KZ, RU, TJ, TM), ヨーロッパ (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

添付公開書類:

- 国際調査報告 (条約第21条(3))
- 補正された請求の範囲 (条約第19条(1))

---

(57) 要約: 室内熱交換器から滴下する水を受ける流水路(5)と、流水路(5)から導かれた水を受けるドレンパンとを備えている空気調和装置の室内機であって、流水路(5)は、長手方向(D1)の一方向に向かって全体が傾斜するとともに、長手方向(D1)に直交する幅方向(D2)の一方向に向かって全体が傾斜する底面(5a)を有している。底面(5a)は、室内熱交換器の下端が設置された設置面(6)よりも下方に位置している。設置面(6)は、長手方向(D1)において、幅方向(D2)の寸法が小さくなる凹部(6a)と寸法が大きくなる凸部(6b)とを有し、設置面(6)と室内熱交換器の下面との間には、遮風部材が設けられている。

DESCRIPTION

Title of Invention

INDOOR UNIT FOR AIR CONDITIONING DEVICE

Technical Field

[0001]

The present invention relates to an indoor unit for an air conditioning device including a drain pan which discharges drain water.

Background Art

[0002]

A reference herein to a patent document or any other matter identified as prior art, is not to be taken as an admission that the document or other matter was known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

[0002a]

A drain pan for collecting and discharging drain water condensed by a heat exchanger at the time of cooling to the outside is provided in an indoor unit for an air conditioning device. In the following PTLs 1 and 2, inventions, in which a drain pan is inclined in one direction and discharges drain water, are disclosed.

Citation List

Patent Literature

[0003]

[PTL 1] International Publication No. 2015/136711

[PTL 2] Japanese Unexamined Patent Application  
Publication No. 2015-102257

Summary of the Invention

[0004]

However, even when water can be smoothly discharged to the outside by inclining the drain pan, it is difficult to smoothly lead drain water in some cases from a water passage, which leads drain water to the drain pan, to the drain pan. For example, even when the water passage is provided to be inclined in one direction, there is a possibility that drain water accumulates or runs over without the inclination provided for the water passage functioning effectively in a case where the indoor unit is inclined and fixed.

[0005]

In view of such circumstances, it is desirable to provide an indoor unit for an air conditioning device that can smoothly lead water to a drain pan from a water passage in which the water lead from a heat exchanger flows.

[0006]

In an attempt to address the aforementioned problems,

the indoor unit for an air conditioning device of the present invention adopts the following means.

That is, according to an aspect of the present invention, there is provided an indoor unit for an air conditioning device comprising: a water passage that receives water dropping from a heat exchanger; and a drain pan that receives the water led from the water passage, wherein the water passage has a bottom surface which is inclined as a whole toward one direction of a longitudinal direction and is inclined as a whole toward one direction of a width direction orthogonal to the longitudinal direction, the bottom surface is positioned lower than a heat exchanger mounting surface where a lower end of the heat exchanger is mounted, the heat exchanger mounting surface has, in the longitudinal direction, a recessed portion of which a dimension in the width direction is small and a protruding portion of which the dimension is large, a wind shielding member is provided between the heat exchanger mounting surface and a lower surface of the heat exchanger, and the wind shielding member has a shape that substantially matches a shape of the heat exchanger mounting surface.

[0007]

Water condensed by the heat exchanger is led to the water passage, and flows into the drain pan. Since the

water passage has the bottom surface which is inclined as a whole toward one direction of the longitudinal direction and is inclined as a whole toward one direction of the width direction, water flowed in the water passage is collected in the one direction of the longitudinal direction, and is collected in the one direction of the width direction. Even when the indoor unit is inclined and attached as described above, water can be smoothly led to the drain pan since the bottom surface as a whole is inclined in the longitudinal direction and the width direction and thereby the inclination of the bottom surface is maintained at all times.

[0008]

In the indoor unit for an air conditioning device

according to the aspect of the present invention, the bottom surface is positioned lower than a heat exchanger mounting surface where a lower end of the heat exchanger is mounted.

[0009]

Since the bottom surface of the water passage is positioned lower than the heat exchanger mounting surface where the lower end of the heat exchanger is mounted, water led from the heat exchanger flows down to the bottom surface at all times, and thereby the water can be smoothly flowed.

[0010]

In the indoor unit for an air conditioning device according to the aspect of the present invention, the heat exchanger mounting surface has, in the longitudinal direction, a recessed portion of which a dimension in the width direction is small and a protruding portion of which the dimension is large. A wind shielding member is provided between the heat exchanger mounting surface and a lower surface of the heat exchanger.

[0011]

The heat exchanger mounting surface is in a shape of having, in the longitudinal direction, the recessed portion of which the dimension in the width direction is small and the protruding portion of which the dimension is

large. Accordingly, a space through which the bottom surface is accessed can be secured larger in the recessed portion than in the protruding portion. Accordingly, when attaching the wind shielding member provided on the heat exchanger mounting surface, the bottom surface can be easily accessed. The wind shielding member fills in the gap between the lower surface of the heat exchanger and the heat exchanger mounting surface, and minimizes air passing through the gap without heat exchange being performed by the heat exchanger.

[0012]

Since the bottom surface of the water passage is inclined as a whole in the longitudinal direction and the width direction, the inclination of the bottom surface is maintained at all times. Thus, water can be smoothly led to the drain pan.

[0012a]

Where any or all of the terms "comprise", "comprises", "comprised" or "comprising" are used in this specification (including the claims) they are to be interpreted as specifying the presence of the stated features, integers, steps or components, but not precluding the presence of one or more other features, integers, steps or components.

Brief Description of Drawings

[0013]

Fig. 1 is a perspective view illustrating an indoor unit for an air conditioning device according to an embodiment of the present invention.

Fig. 2 is a perspective view illustrating an inside of the indoor unit of Fig. 1.

Fig. 3 is a partially enlarged view of a vicinity of

a heat exchanger mounting surface of the indoor unit of Fig. 1.

Fig. 4 is a front view illustrating an indoor heat exchanger provided inside the indoor unit of Fig. 1.

Fig. 5A is a sectional view which illustrates a water passage and is taken along cutting plane line A-A of Fig. 4.

Fig. 5B is a sectional view which illustrates the water passage and is taken along cutting plane line B-B of Fig. 4.

#### Description of Embodiments

[0014]

Hereinafter, an embodiment according to the present invention will be described with reference to the drawings.

Fig. 1 illustrates an appearance of an indoor unit 1 of an air conditioning device. The indoor unit 1 is a wall-hanging type, sucks indoor air from above, and blows air after air conditioning indoors from below. The indoor unit 1 is connected to an outdoor unit (not illustrated), receives supply of a refrigerant compressed by the outdoor unit, and adjusts indoor air so as to have a predetermined temperature by means of indoor heat exchangers provided inside the indoor unit 1.

[0015]

Fig. 2 illustrates an inside of the indoor unit 1. Fig. 2 illustrates a state where the indoor heat exchangers or a fan is removed. A water passage 5 that leads drain water condensed by the indoor heat exchangers is formed in a base plate 3 mounted in an indoor wall portion. The water passage 5 is a groove portion extending in a right-and-left direction (horizontal direction) of the base plate 3. A mounting surface (heat exchanger mounting surface) 6 that supports lower surfaces of the indoor heat exchangers is provided above the water passage 5.

[0016]

The water passage 5 is formed to be bent at a substantially right angle in a left end of the indoor unit 1 and to face downwards. A drain pan 7 that receives drain water flowing down from a lower end of the water passage 5 is provided below the base plate 3. The drain pan 7 temporarily stores the drain water and discharges the drain water to the outside of the indoor unit 1.

[0017]

As illustrated in Fig. 3, a bottom surface 5a of the water passage 5 is inclined as a whole in a longitudinal direction D1 such that a left side thereof becomes a lower side, and is inclined as a whole in a width direction D2 such that a front side (indoor unit front side) thereof

becomes a lower side. Accordingly, drain water is led to the left and the front side. It is evident that a direction where the water passage 5 is inclined may be the right and the back side (indoor unit back side).

[0018]

As illustrated in Figs. 2 and 3, the mounting surface 6 has recessed portions 6a each of which has a small dimension in the width direction and protruding portions 6b each of which has a large dimension in the width direction. That is, the recessed portions 6a and the protruding portions 6b are alternately provided on a front side of the mounting surface 6 in the longitudinal direction.

[0019]

As illustrated in Fig. 4, indoor heat exchangers 9 are provided inside the indoor unit 1. The indoor heat exchangers 9 illustrated in Fig. 4 are provided on a back surface side of the indoor unit 1.

[0020]

Fig. 5A is a sectional view taken along cutting plane line A-A of Fig. 4, and Fig. 5B is a sectional view taken along cutting plane line B-B of Fig. 4.

As illustrated in Figs. 5A and 5B, a wind shielding member 8 is provided as an insulator, between the lower surfaces of the indoor heat exchangers 9 and the mounting

surface 6. The wind shielding member 8 has a shape that substantially matches a shape of the mounting surface 6 illustrated in Figs. 2 and 3. The wind shielding member 8 is a member having flexibility to fill in a gap between the lower surfaces of the indoor heat exchangers 9 and the mounting surface 6, and is used in order to minimize air passing through the gap without heat exchange being performed by the indoor heat exchangers 9.

[0021]

A width W1 of the wind shielding member 8, that is, the mounting surface 6 in Fig. 5A is larger than a width W2 of the wind shielding member 8, that is, the mounting surface 6 in Fig. 5B. The widths W1 and W2 correspond to the recessed portion 6a and the protruding portion 6b provided on the mounting surface 6 illustrated in Figs. 2 and 3. That is, a width which is open to the water passage 5 (for example, 20 mm to 30mm) is large in each of the recessed portions 6a of the mounting surface 6 as illustrated in Fig. 5B, and a width which is open to the water passage 5 (for example, approximately 15 mm) is small in each of the protruding portions 6b of the mounting surface 6 as illustrated in Fig. 5A. Therefore, it is easy for an operator to access from above the water passage 5 at a position where the width of the mounting surface 6 is small and the width which is open to the

water passage 5 is large as illustrated in Fig. 5A.

[0022]

As can be seen from Figs. 5A and 5B, the bottom surface 5a of the water passage 5 is provided below the mounting surface 6, and the mounting surface 6 and the bottom surface 5a are inclined such that the front side (the left in Figs. 5A and 5B) of the indoor unit 1 becomes the lower side.

Although two indoor heat exchangers 9 are provided in an overlapping manner in Figs. 5A and 5B, there may be one heat exchanger.

[0023]

In the aforementioned indoor unit 1, the following operation effects can be achieved.

Water condensed by the indoor heat exchangers 9 is led to the water passage 5, and flows into the drain pan 7. Since the water passage 5 has the bottom surface 5a which is inclined as a whole toward one direction of the longitudinal direction D1 and is inclined as a whole toward one direction of the width direction D2, water flowed in the water passage 5 is collected in the one direction of the longitudinal direction D1, and is collected in the one direction of the width direction D2. Even when the indoor unit 1 is inclined and attached as described above, water can be smoothly led to the drain

pan 7 since the bottom surface 5a as a whole is inclined in the longitudinal direction D1 and the width direction D2 and thereby the inclination of the bottom surface 5a is maintained at all times.

[0024]

Since the bottom surface 5a of the water passage 5 is positioned lower than the mounting surface 6 where lower ends of the indoor heat exchangers 9 are mounted as illustrated in Figs. 5A and 5B, drain water led from the indoor heat exchangers 9 flows down to the bottom surface 5a at all times, and thereby the drain water can be smoothly flowed.

[0025]

The mounting surface 6 is in a shape of having, in the longitudinal direction, the recessed portions 6a each of which has a small dimension in the width direction and the protruding portions 6b each of which has a large dimension in the width direction. Accordingly, a space through which the bottom surface 5a is accessed can be secured larger in the recessed portions 6a than in the protruding portions 6b. Accordingly, when attaching the wind shielding member 8 provided on the mounting surface 6, the bottom surface can be easily accessed.

Reference Signs List

[0026]

- 1: indoor unit
- 3: base plate
- 5: water passage
- 5a: bottom surface
- 6: mounting surface (heat exchanger mounting surface)
- 7: drain pan
- 8: wind shielding member
- 9: indoor heat exchanger (heat exchanger)

The claims defining the invention are as follows:

[Claim 1]

An indoor unit for an air conditioning device,  
comprising:

a water passage that receives water dropping from a  
heat exchanger; and

a drain pan that receives the water led from the  
water passage,

wherein the water passage has a bottom surface which  
is inclined as a whole toward one direction of a  
longitudinal direction and is inclined as a whole toward  
one direction of a width direction orthogonal to the  
longitudinal direction,

the bottom surface is positioned lower than a heat  
exchanger mounting surface where a lower end of the heat  
exchanger is mounted,

the heat exchanger mounting surface has, in the  
longitudinal direction, a recessed portion of which a  
dimension in the width direction is small and a protruding  
portion of which the dimension is large,

a wind shielding member is provided between the heat  
exchanger mounting surface and a lower surface of the heat  
exchanger, and

the wind shielding member has a shape that substantially matches a shape of the heat exchanger mounting surface.

1/3  
FIG. 1

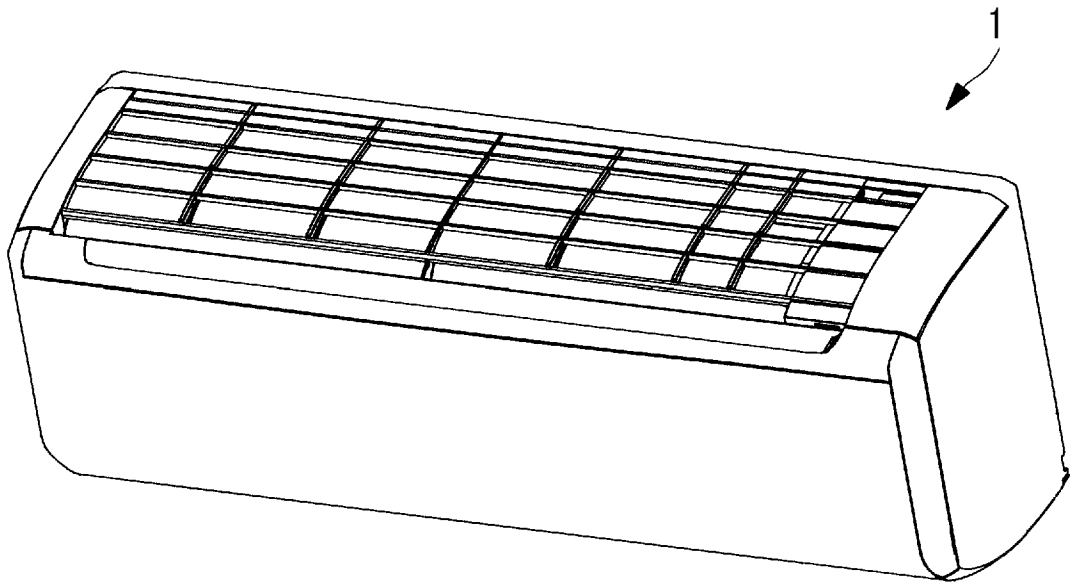
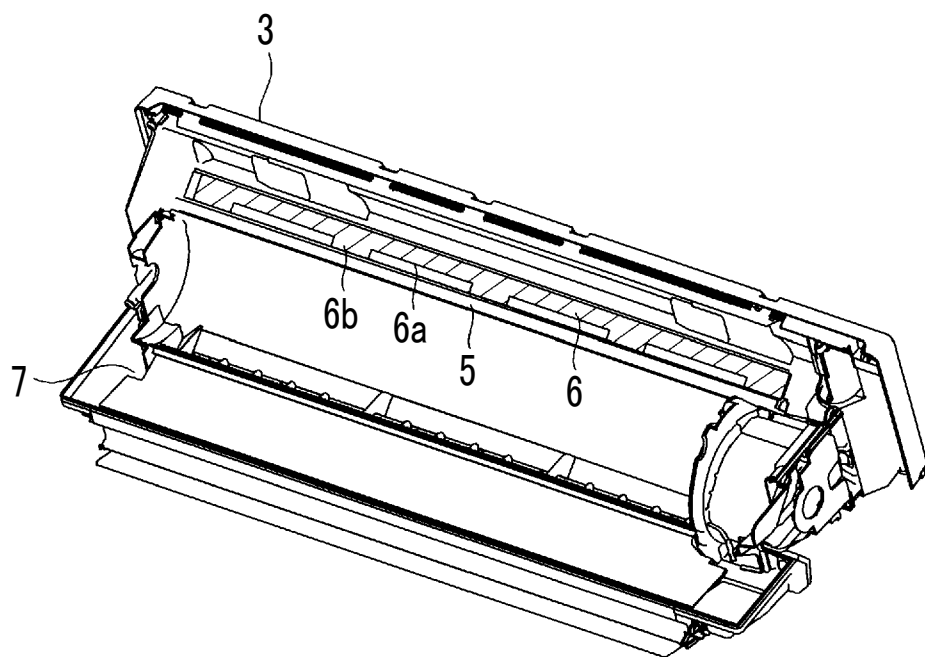


FIG. 2



2/3  
FIG. 3

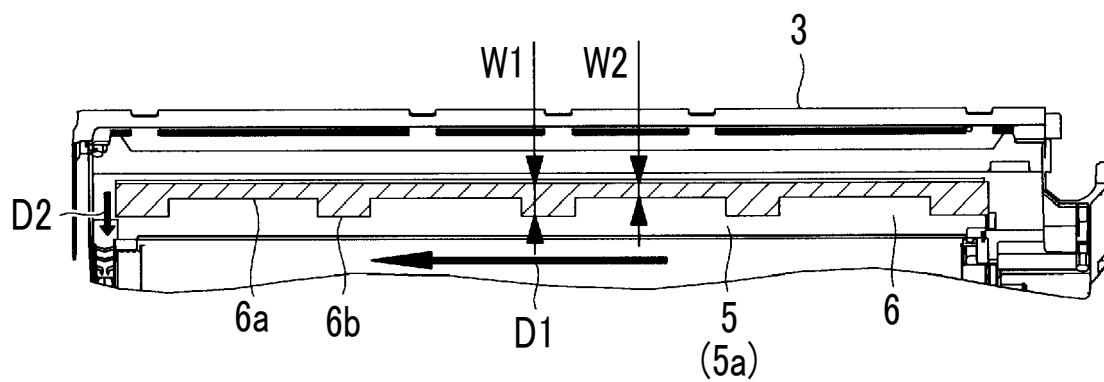


FIG. 4

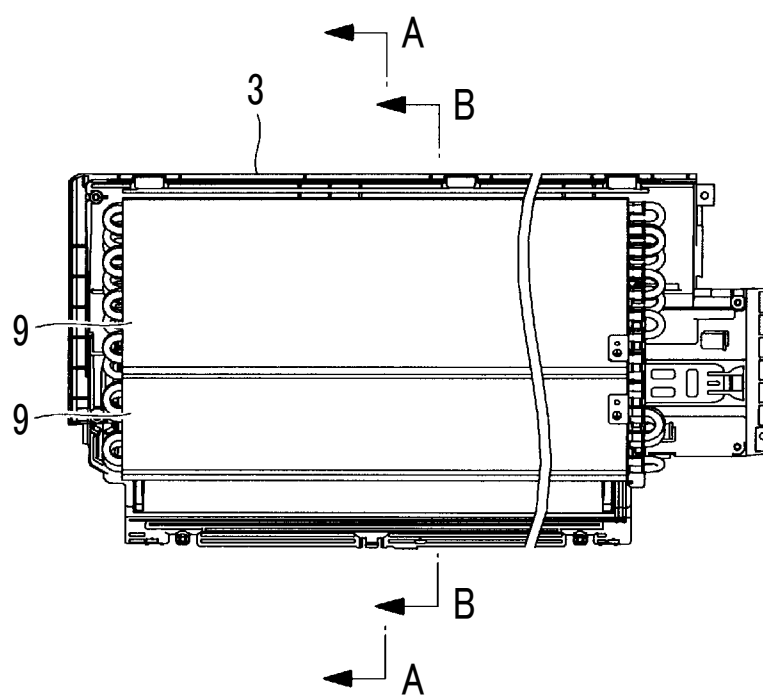


FIG. 5A

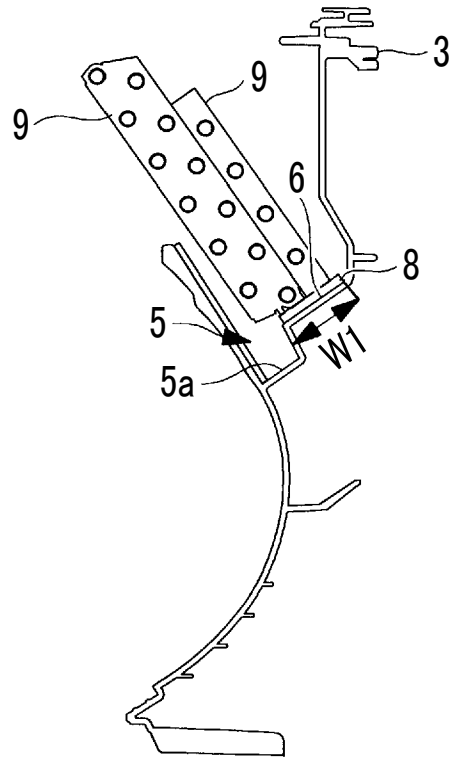


FIG. 5B

