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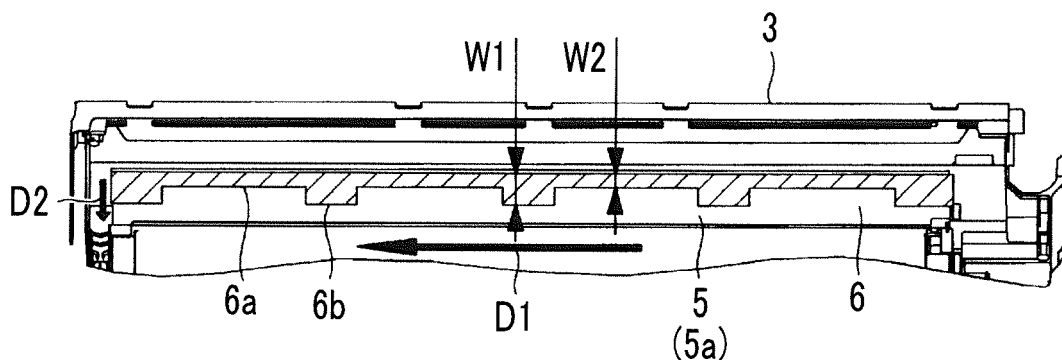
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(54) **INDOOR UNIT FOR AIR CONDITIONING DEVICE**

(57) 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 di-

rection (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.

FIG. 3



Description

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 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 Invention

Technical Problem

[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, an object of the present invention is 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.

Solution to Problem

[0006] In order to solve the problems, the indoor unit for an air conditioning device of the present invention adopts the following means.

[0007] That is, according to an aspect of the present invention, there is provided an indoor unit for an air conditioning device including a water passage that receives water dropping from a heat exchanger and a drain pan that receives the water led from the water passage. 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.

[0008] 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.

[0009] 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.

[0010] 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.

[0011] 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.

[0012] 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.

Advantageous Effects of Invention

[0013] 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.

Brief Description of Drawings

[0014]

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

[0015] Hereinafter, an embodiment according to the present invention will be described with reference to the drawings.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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).

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] Although two indoor heat exchangers 9 are provided in an overlapping manner in Figs. 5A and 5B, there may be one heat exchanger.

[0027] In the aforementioned indoor unit 1, the following operation effects can be achieved.

[0028] 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.

[0029] 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.

[0030] 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

[0031]

- 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)

Claims

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.

2. The indoor unit for an air conditioning device according to Claim 1,
wherein the bottom surface is positioned lower than a heat exchanger mounting surface where a lower end of the heat exchanger is mounted.
3. The indoor unit for an air conditioning device according to Claim 2,
wherein 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, and
a wind shielding member is provided between the heat exchanger mounting surface and a lower surface of the heat exchanger.

Amended claims under Art. 19.1 PCT

1. (Amended) 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.

2. (Canceled)

3. (Canceled)

FIG. 1

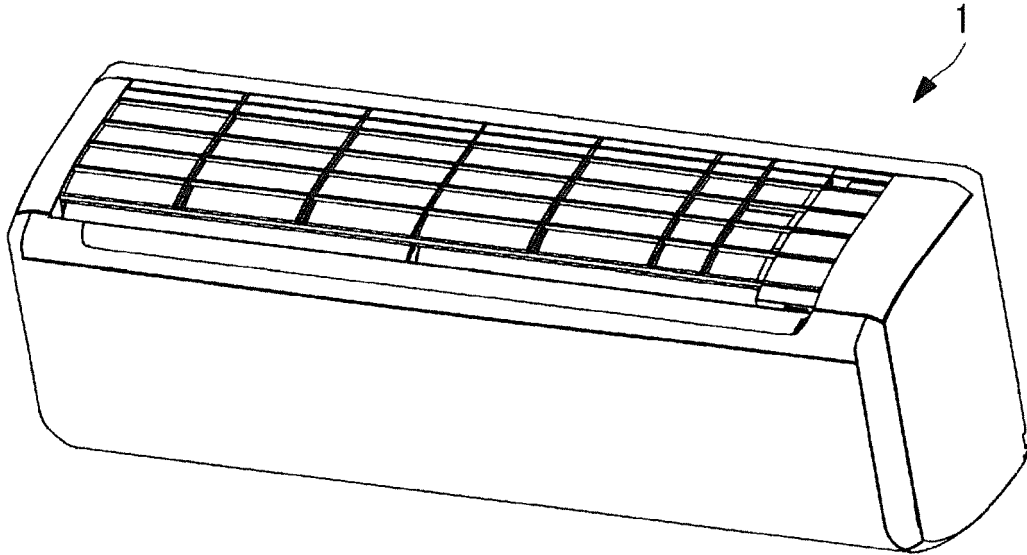


FIG. 2

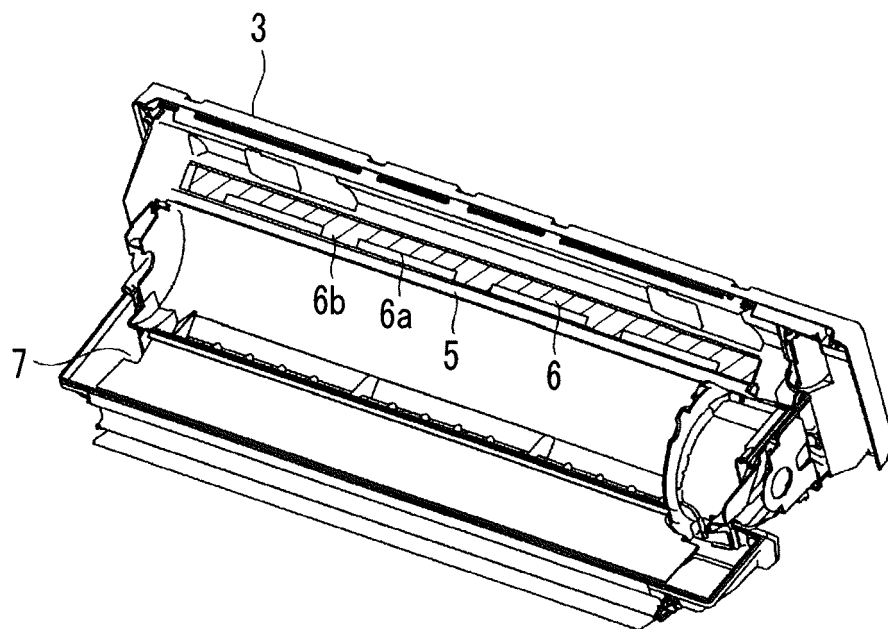


FIG. 3

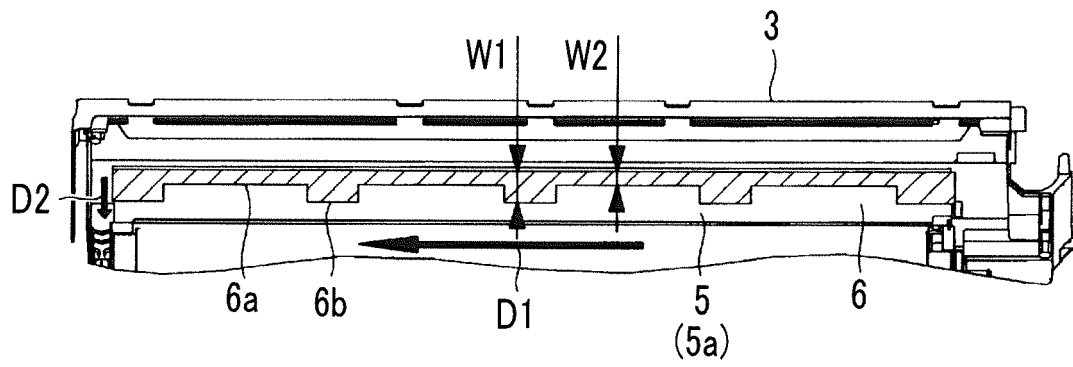


FIG. 4

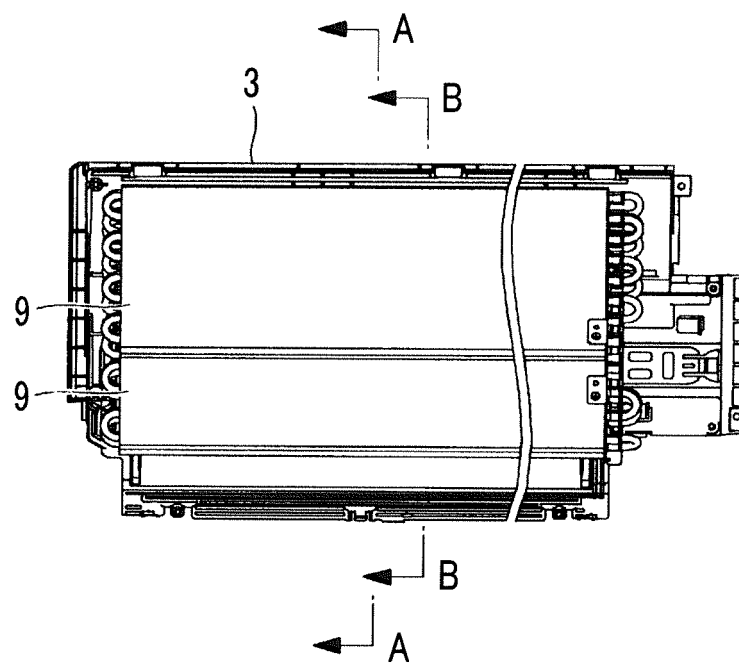


FIG. 5A

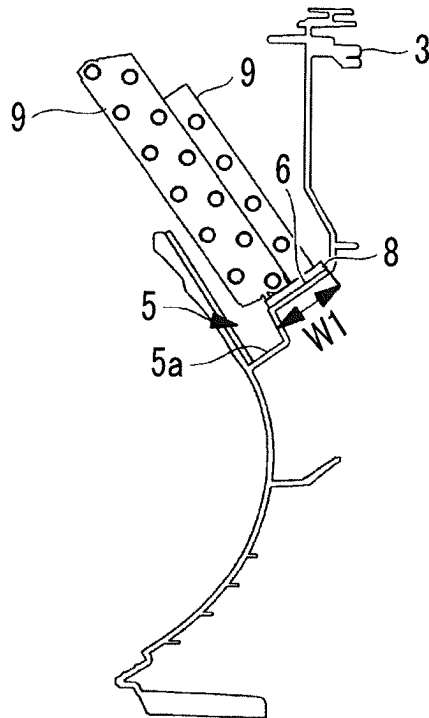
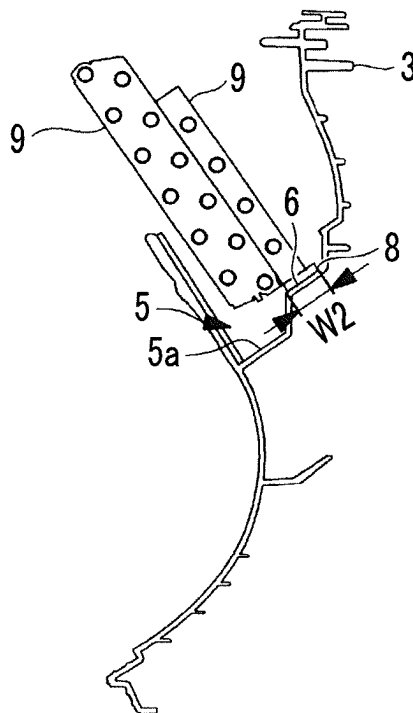


FIG. 5B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/008862

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl. F24F13/22 (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)
Int.Cl. F24F13/22

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2018

Registered utility model specifications of Japan 1996-2018

Published registered utility model applications of Japan 1994-2018

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 06-257778 A (DAIKIN INDUSTRIES, LTD.) 16 September 1994, paragraphs [0005]-[0009], fig. 1-2 (Family: none)	1-3
Y	JP 2015-102257 A (DAIKIN INDUSTRIES, LTD.) 04 June 2015, paragraphs [0044], [0058]-[0060], fig. 6-7, 11 (Family: none)	1-3
Y	JP 2010-249466 A (DAIKIN INDUSTRIES, LTD.) 04 November 2010, paragraphs [0068]-[0071], fig. 10-14 (Family: none)	2-3



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2015136711 A [0003]
- JP 2015102257 A [0003]