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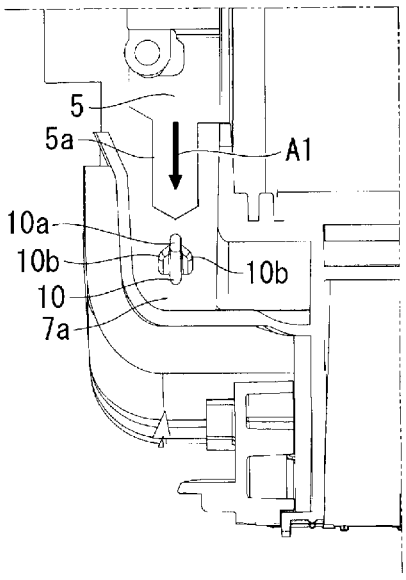
(54) **Title:** INDOOR UNIT FOR AIR CONDITIONING DEVICE

(54) 発明の名称： 空気調和装置の室内機

[図4]



(57) **Abstract:** Provided is an indoor unit for an air conditioning device, the indoor unit being provided with: a base on which an indoor heat exchanger is installed and which has formed therein a water flow passage (5) for receiving drain water dripping from the indoor heat exchanger; and a drain pan (7) for receiving water conducted from the water flow passage (5) in the base. The drain pan (7) is provided with a protrusion (10) at a location onto which water dripping from a gutter (5a) for the water flow passage (5) drips. The protrusion (10) is provided with a vertically extending vertical section (10a) and laterally extending shoulders (10b).

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

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— 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:室内熱交換器が設置されるとともに室内熱交換器から滴下するドレン水を受ける流水路(５)が形成されたベース部と、ベース部の流水路(５)から導かれた水を受けるドレンパン(７)とを備えている空気調和装置の室内機であって、ドレンパン(７)は、流水路(５)の樋(５ａ)から滴下する水が落下する位置に、突起部(１０)を備えている。突起部(１０)は、上下方向に延在する鉛直部(１０ａ)と、側方に延在する肩部(１０ｂ)とを備えている。

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 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 PTL 1, an indoor unit including a drain pan, in which a soft guide member leads drain water and the drain water drops to the drain pan via a heat transfer pipe that is in contact with the soft guide member on a downstream side, is disclosed.

Citation List

Patent Literature

[0003]

[PTL 1] Japanese Unexamined Patent Application Publication No. 11-211134

2018246201 26 Jun 2019

[0003a]

Any reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or 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.

[0003b]

Throughout the description and claims of the specification, the word "comprise" and variations of the word, such as "comprising" and "comprises", is not intended to exclude other additives, components, integers or steps.

Summary of Invention

Technical Problem

[0004]

However, when drain water drops into the drain pan, a water drop directly lands onto a water surface of water stored in the drain pan, and thereby a landing sound is made. Since there is a possibility that the landing sound causes discomfort to a user, it is preferable to reduce the landing sound.

[0005]

In view of such circumstances, at least some embodiments of the present invention provide an indoor

unit for an air conditioning device including a drain pan that can reduce a landing sound.

Solution to Problem

[0006]

With these issues in mind, 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 base portion on which a heat exchanger is mounted and in which a water passage receiving water dropping from the heat exchanger is formed; and a drain pan that receives the water led from the water passage of the base portion, wherein the drain pan includes a protrusion portion at a position where the water dropping from the water passage falls the protrusion portion protrudes from a side wall portion of the drain and includes a vertical portion extending in the vertical direction and a shoulder portion extending in a horizontal direction along the side wall portion so as to intersect both sides of the vertical portion.

[0007]

Water condensed by the heat exchanger is led to the water passage, and flows into the drain pan. The drain pan includes the protrusion portion at the position where

the water dropping from the water passage falls. Accordingly, dropping water flows into the drain pan after colliding with the protrusion portion, and the water does not directly drop onto a water surface of water stored in the drain pan. Therefore, a landing sound which is made when a water drop lands onto the water surface can be reduced.

[0008]

In the indoor unit for an air conditioning device according to the aspect of the present invention, the protrusion portion includes a shoulder portion extending in a horizontal direction along the side wall portion so as to intersect both sides of the vertical portion.

[0009]

By providing the protrusion portion on the side wall portion of the drain pan, the protrusion portion can be mounted in the vicinity of the position where water drops

from the water passage. In addition, by providing the shoulder portion, which extends in the horizontal direction along the side wall portion, in the protrusion portion, a liquid drop can come into contact with the shoulder portion even in a case where the position at which water drops from the water passage is shifted in the horizontal direction, and thereby a landing sound can be reliably reduced.

[0010]

In the indoor unit for an air conditioning device according to the aspect of the present invention, a tip of the shoulder portion faces upwards.

[0011]

Since the tip of the shoulder portion faces upwards, a liquid drop can flow downwards even in a case where the liquid drop is attached to the tip of the shoulder portion. Thus, water stagnation can be avoided.

[0012]

In the indoor unit for an air conditioning device according to the aspect of the present invention, the protrusion portion has a substantially cross shape in a case where the protrusion portion is seen from a front.

[0013]

By configuring the protrusion portion to have the substantially cross shape in a case where the protrusion

portion is seen from the front, a water drop mainly comes into contact with the upper end of a portion of the cross shape, which extends in an up-and-down direction, and a water drop can come into contact with some part of the shoulder portion, which extends in the horizontal direction, in the cross shape even in a case where the position at which water drops is shifted. A landing sound can be reliably reduced with a convenient protrusion shape as described above.

Instead of the cross shape, the protrusion portion may have an inverted V-shape, an inverted U-shape, or a combtooth shape in which a plurality of portions extending in the up-and-down direction are arranged in the horizontal direction.

Advantageous Effects of Invention

[0014]

Since dropping water flows into the drain pan after colliding with the protrusion portion, a landing sound can be reduced.

Brief Description of Drawings

[0015]

Fig. 1 is a perspective view illustrating an indoor unit 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 perspective view illustrating a part of a drain path of the indoor unit.

Fig. 4 is a partially enlarged view illustrating an enlarged part of the drain path of the indoor unit.

Fig. 5 is a perspective view illustrating a protrusion portion of Fig. 4.

Fig. 6 is a front view seen from a VI-direction of Fig. 5.

Fig. 7 is a side view illustrating the protrusion portion of Fig. 4.

Fig. 8 is a front view seen from a VIII-direction of Fig. 7.

Fig. 9A is a front view illustrating a modification example of the protrusion portion.

Fig. 9B is a front view illustrating another modification example of the protrusion portion.

Description of Embodiments

[0016]

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 an indoor heat exchanger 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 exchanger or a fan is removed. A water passage 5 that leads drain water condensed by the indoor heat exchanger 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 6 that supports a lower surface of the indoor heat exchanger is provided above the water passage 5. A left side of the water passage 5 is inclined downwards, and accordingly, drain water is led to the left as shown with an arrow A1. It is evident that a direction where the water passage 5 is inclined may be the right.

[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]

Fig. 3 is a partially enlarged view of a region where drain water flows from the water passage 5 to the drain pan 7. A gutter 5a that leads drain water to the drain pan 7 is provided in the lower end of the water passage 5. Drain water drops downwards from a tip (lower end) of the gutter 5a. A protrusion portion 10 is provided below the gutter 5a and on a side wall portion 7a of the drain pan 7. A drain port 7b through which drain water is discharged to the outside of the indoor unit 1 is formed below the protrusion portion 10. The reference sign 12 in Fig. 3 indicates a fan for blowing air.

[0020]

As illustrated in Fig. 4, the protrusion portion 10 is provided to protrude from the side wall portion 7a of the drain pan 7. The protrusion portion 10 includes a vertical portion 10a extending in a vertical direction and a shoulder portion 10b extending in a horizontal direction so as to intersect both sides of the vertical portion 10a. An upper end of the vertical portion 10a is disposed to be positioned immediately below the gutter 5a. Accordingly, drain water dropping from the gutter 5a is directly taken.

[0021]

As can be seen from Fig. 5, the shoulder portion 10b is erected from the side wall portion 7a of the drain pan 7 toward a diagonally upward direction. Since the shoulder portion 10b is provided to face diagonally upwards as described above, drain water can smoothly flow downwards.

[0022]

As illustrated in Fig. 6, the protrusion portion 10 has a substantially cross shape when seen from the front in a direction where the shoulder portion 10b is erected (arrow VI direction). That is, the shoulder portion 10b is provided to cross the vertical portion 10a so as to be orthogonal to each other.

[0023]

As illustrated in Fig. 7, when the protrusion portion 10 is seen from the side, the vertical portion 10a has an upper side 10a1 extending in the substantially horizontal direction, and has a hypotenuse 10a2 connected to the side wall portion 7a which is connected to the upper side 10a1 and faces diagonally downwards. The shoulder portion 10b extends in a direction parallel to the hypotenuse 10a2.

[0024]

In Fig. 8, when a lower surface of the shoulder

portion 10b is seen from the front as shown with an arrow VIII of Fig. 7, an upper end 10b1 of the shoulder portion 10b is formed such that a height thereof becomes gradually lower as going further away from the vertical portion 10a.

[0025]

In the indoor unit 1 including the aforementioned protrusion portion 10, the following operation effects can be achieved.

Drain water condensed by the indoor heat exchanger is led to the water passage 5, and flows into the drain pan 7 from the gutter 5a. The protrusion portion 10 is included at a position where drain water drops from the water passage 5, on the side wall portion 7a of the drain pan 7. More specifically, the upper side 10a1 of the vertical portion 10a is positioned immediately below the gutter 5a. Accordingly, dropping drain water flows into the drain pan 7 after colliding with the protrusion portion 10, and the water does not directly land onto a water surface of water stored in the drain pan 7. Therefore, a landing sound which is made when a water drop lands onto the water surface can be reduced.

[0026]

By providing the protrusion portion 10 on the side wall portion 7a of the drain pan 7, the protrusion portion 10 can be positioned in the vicinity of the gutter 5a of

the water passage 5. In addition, by providing the shoulder portion 10b, which extends in the horizontal direction along the side wall portion 7a, in the protrusion portion 10, a liquid drop can come into contact with the shoulder portion 10b even in a case where the position at which drain water drops from the gutter 5a is shifted in the horizontal direction, and thereby a landing sound can be reliably reduced.

[0027]

By configuring the protrusion portion 10 to have a substantially cross shape in a case where the protrusion portion is seen from the front in a protruding direction of the shoulder portion 10b of the protrusion portion 10 (arrow VI direction of Fig. 5), a water drop mainly comes into contact with the upper side 10a1 of the vertical portion 10a, which extends in the vertical direction, in the cross shape, and a water drop can come into contact with some part of the shoulder portion 10b, which extends in the horizontal direction, in the cross shape even in a case where the position at which water drops is shifted. A landing sound can be reliably reduced with a convenient protrusion shape as described above.

[0028]

Since the shoulder portion 10b is formed such that the upper end 10b1 of the shoulder portion 10b faces

diagonally upwards, a liquid drop can flow downwards even in a case where the liquid drop is attached to the upper end 10b1 of the shoulder portion 10b. Thus, water stagnation can be avoided.

[0029]

Although the aforementioned protrusion portion 10 has a substantially cross shape in a case where the protrusion portion is seen from the front, modifications can be made as follows.

For example, in a case of being seen from the front, a protrusion portion 10′ may have an inverted V-shape as illustrated in Fig. 9A. In this case, an upper tip 10′a mainly receives a liquid drop, and a shoulder portion 10′b extending to the side receives a liquid drop in a case where a position where drain water drops is shifted to the side.

[0030]

In addition, in a case of being seen from the front, a protrusion portion 10″ may have a combtooth shape in which a plurality of vertical portions 10″a and 10″b extending in the vertical direction are arranged in the horizontal direction as illustrated in Fig. 9B. In this case, the vertical portion 10″a positioned in the middle mainly receives a liquid drop, and the vertical portions (shoulder portions) 10″b positioned on the sides receive a

liquid drop in a case where a position where drain water drops is shifted to the side.

Reference Signs List

[0031]

1: indoor unit

3: base plate (base portion)

5: water passage

5a: gutter

6: mounting surface

7: drain pan

7a: side wall portion

7b: drain port

10: protrusion portion

10a: vertical portion

10a1: upper side

10a2: hypotenuse

10b: shoulder portion

10b1: upper end

12: fan

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The claims defining the invention are as follows:

[Claim 1]

An indoor unit for an air conditioning device, comprising:

a base portion on which a heat exchanger is mounted and in which a water passage receiving water dropping from the heat exchanger is formed; and

a drain pan that receives the water led from the water passage of the base portion,

wherein the drain pan includes a protrusion portion at a position where the water dropping from the water passage falls

the protrusion portion protrudes from a side wall portion of the drain and includes a vertical portion extending in the vertical direction and a shoulder portion extending in a horizontal direction along the side wall portion so as to intersect both sides of the vertical portion.

[Claim 2]

The indoor unit for an air conditioning device according to Claim 1,

wherein a tip of the shoulder portion faces upwards.

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[Claim 3]

The indoor unit for an air conditioning device according to Claim 1 or 2,

wherein the protrusion portion has a substantially cross shape in a case where the protrusion portion is seen from a front.

FIG. 1

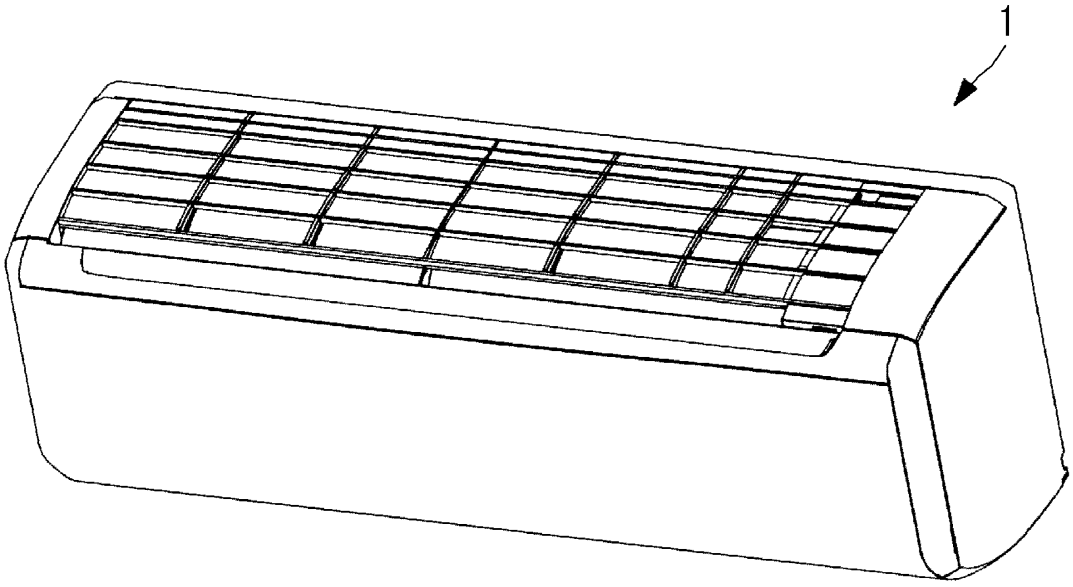

FIG. 2

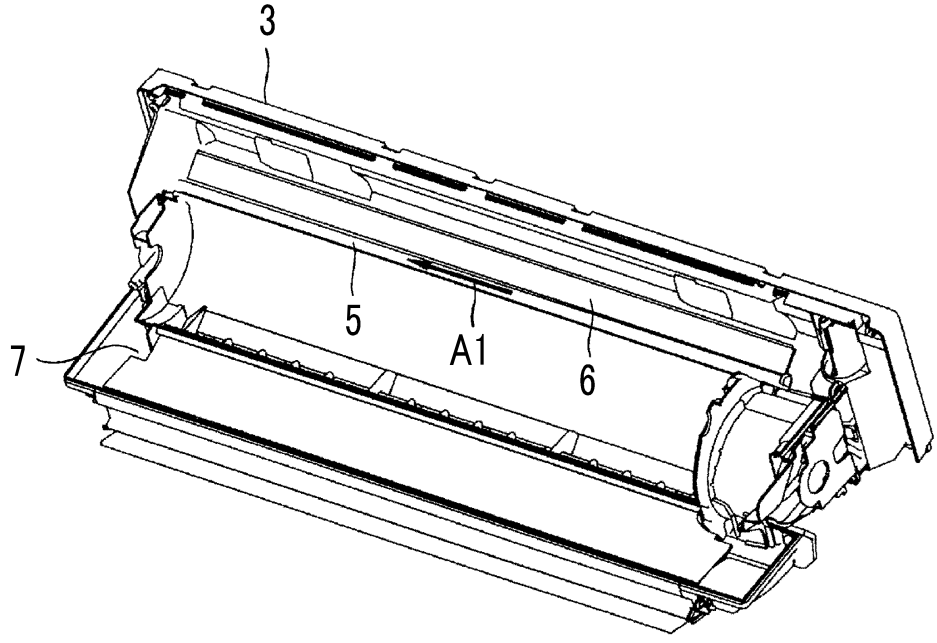

FIG. 3

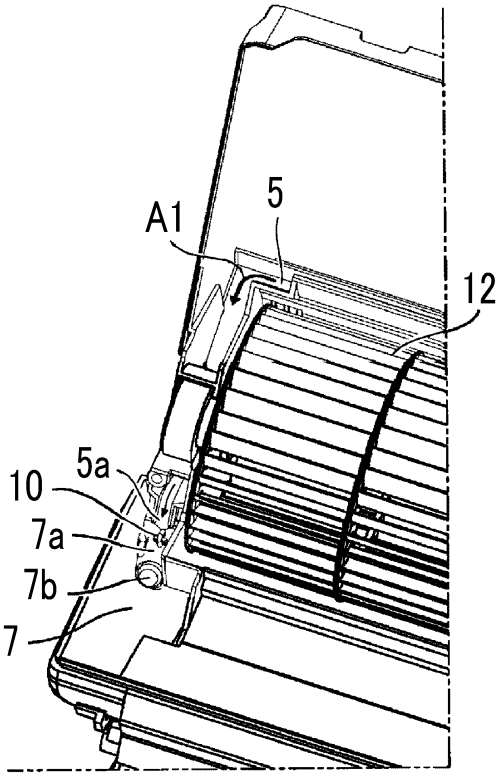

FIG. 4

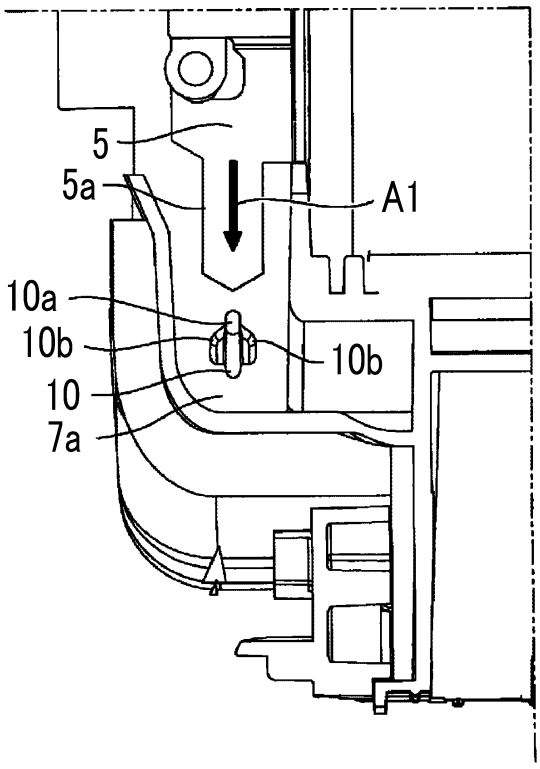

FIG. 5

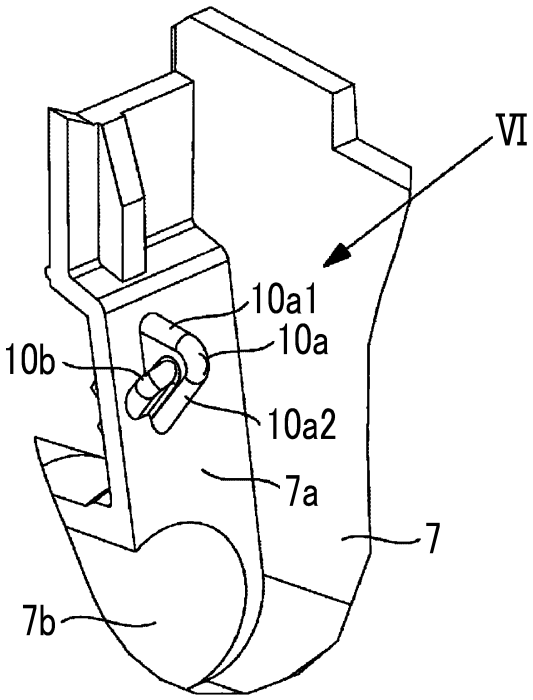

FIG. 6

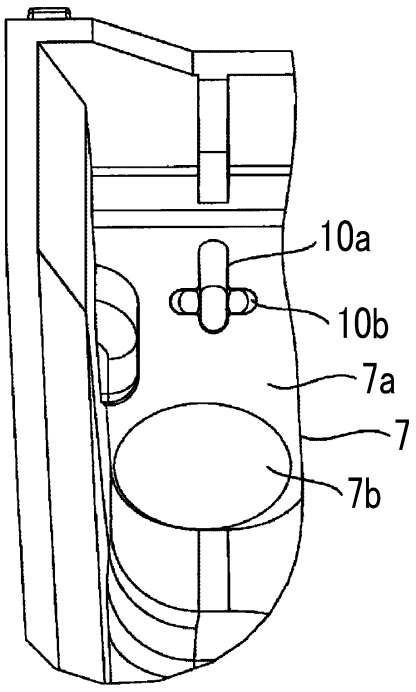

FIG. 7

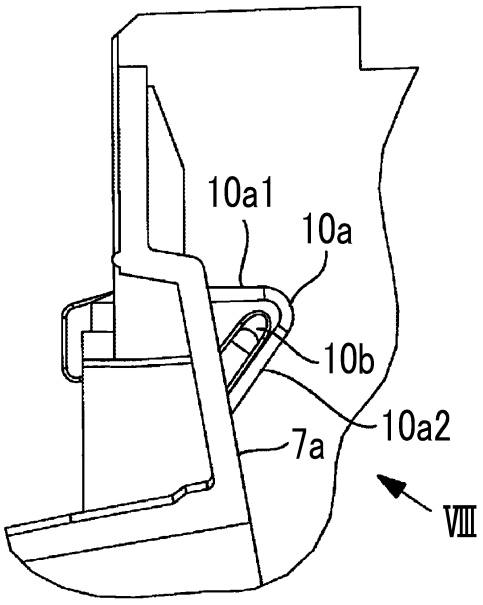

FIG. 8

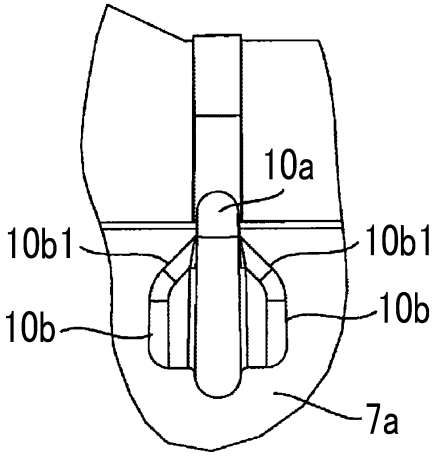

FIG. 9A

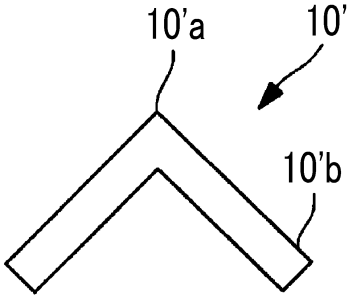

FIG. 9B