(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 712 516 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
23.09.2020 Bulletin 2020/39

(21) Application number: **19798515.3**

(22) Date of filing: **22.10.2019**

(51) Int Cl.:
F24F 1/0073 *(2019.01)* ***F24F 13/28*** *(2006.01)*

(86) International application number:
PCT/CN2019/112431

(87) International publication number:
WO 2020/155676 (06.08.2020 Gazette 2020/32)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **31.01.2019 CN 201920179040 U**

(71) Applicants:
- **GD Midea Air-Conditioning Equipment Co., Ltd.**
  Foshan, Guangdong 528311 (CN)
- **Midea Group Co., Ltd.**
  Foshan, Guangdong 528311 (CN)

(72) Inventors:
- **ZHAO, Weiqiang**
  Guangdong 528311 (CN)
- **AN, Mingbo**
  Guangdong 528311 (CN)

(74) Representative: **Lam, Alvin et al**
Maucher Jenkins
26 Caxton Street
London SW1H 0RJ (GB)

(54) WALL-MOUNTED INDOOR AIR CONDITIONER UNIT

(57) Disclosed is an indoor unit of a wall-mounted air conditioner, including: a chassis, a screen assembly, and a cleaning assembly disposed at one end of the screen assembly and connected with the screen assembly by a fastening structure; where the cleaning assembly is mounted on the chassis, or the screen assembly is mounted on the chassis, or the cleaning assembly and the screen assembly are both mounted on the chassis.

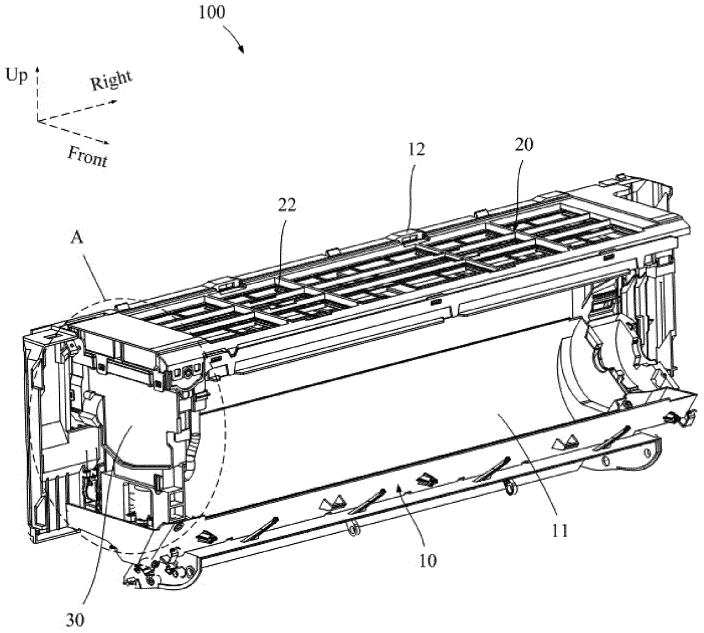


FIG. 2

EP 3 712 516 A1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure claims the priority of Chinese Patent Application with No. 201920179040.5, entitled " INDOOR UNIT OF WALL-MOUNTED AIR CONDITIONER", filed on January 31, 2019, the entirety of which are hereby incorporated herein by reference.

FIELD

[0002] The present application relates to the field of air conditioning technology, and in particular to an indoor unit of a wall-mounted air conditioner.

BACKGROUND

[0003] A cleaning assembly may be provided on one side of an indoor unit of a wall-mounted air conditioner for automatically washing the screen. The cleaning assembly and the screen assembly are usually mounted on the chassis, and the relative position between them may be adjusted to mesh the gear of the cleaning assembly with the screen, so that the screen may be driven to move for the washing process.

[0004] However, in the above structure, there is no direct assembly relationship between the cleaning assembly and the screen assembly, so that the relative position between the cleaning assembly and the screen assembly may be unstable, and the meshing between the gear of the cleaning assembly and the screen is prone to have defects such as misalignment, jamming, abnormal noise, etc., which leads to a poor transmission reliability of the screen during the washing process.

SUMMARY

[0005] The main purpose of the present application is to provide an indoor unit of a wall-mounted air conditioner, aiming at solving the technical problem of poor transmission reliability of a screen during the washing process.

[0006] To achieve the above purpose, the present application provides an indoor unit of a wall-mounted air conditioner, including:

a chassis;
a screen assembly; and
a cleaning assembly disposed at one end of the screen assembly and connected with the screen assembly by a fastening structure;
wherein the cleaning assembly is mounted on the chassis, or the screen assembly is mounted on the chassis, or the cleaning assembly and the screen assembly are both mounted on the chassis.

[0007] Optionally, the fastening structure is a detachable structure.

[0008] Optionally, the fastening structure includes:

a first buckle structure;
or the fastening structure includes:
a first threaded structure;
or the fastening structure includes:
a first threaded structure; and
a first threaded structure.

[0009] Optionally, the screen assembly includes:

a grille assembly including a first connecting member extending downwardly from one end of the grille assembly, and where the cleaning assembly includes:
a cleaning box disposed below the grille assembly;
where the first buckle structure includes:
a first buckle hole defined in the first connecting member; and
a first buckle protruded from the cleaning box;
or the first buckle structure includes:

a first buckle protruded from the first connecting member; and
a first buckle hole defined in the cleaning box;
where the first buckle is adaptively engaged in the first buckle hole.

[0010] Optionally, a second connecting member extends downwardly from a front portion of the grille assembly; the first buckle structure further includes:

a second buckle hole defined in the second connecting member; and
a second buckle protruded from the cleaning box;
or the first buckle structure further includes:
a second buckle protruded from the second connecting member; and
a second buckle hole defined in the cleaning box;
where the second buckle is adaptively engaged in the second buckle hole.

[0011] Optionally, the screen assembly includes:

a grille assembly, and
where the cleaning assembly includes:
a cleaning box disposed below the grille assembly and including a third connecting member extending upwardly from an edge of an opening of the cleaning box, and
where the first threaded structure includes:
a first locking screw penetrating the third connecting member and threaded with one end of the grille assembly.

[0012] Optionally, the chassis includes:

a bottom wall defining an accommodating space; and
a rear side wall connected to a rear side of the bottom wall,
where a lower portion of the cleaning assembly is mounted in the accommodating space; and
where an upper portion of the cleaning assembly is connected with the rear side wall by a second threaded structure; or the screen assembly is connected with the rear side wall by a second buckle structure; or
an upper portion of the cleaning assembly is connected with the rear side wall by a second threaded structure, and the screen assembly is connected with the rear side wall by a second buckle structure.

[0013] Optionally, a fourth connecting member is protruded from the cleaning box of the cleaning assembly and extended away from the other end of the screen assembly; and
where the second threaded structure includes:

a second locking screw penetrating the fourth connecting member and threaded with the rear side wall; and/or
where the second buckle structure includes:
a third buckle hole defined in the rear side wall; and
an inserting buckle protruded from the screen assembly; or
the second buckle structure includes:
an inserting buckle protruded from the rear side wall; and
a third buckle hole defined in the screen assembly;
where the inserting buckle is inserted into the third buckle hole.

[0014] Optionally, the fourth connecting member is integrally formed on a rear side edge of the third connecting member.

[0015] Optionally, a gear of the cleaning assembly is engaged with an engaging member of a screen of the screen assembly,
where the engaging member is a rack;
or the engaging member defines at least one engaging hole.

[0016] Optionally, the indoor unit of the wall-mounted air conditioner further includes:

a face frame detachably mounted on the chassis,
where the face frame and the chassis defines an accommodating cavity cooperatively, and the screen assembly and the cleaning assembly are mounted in the accommodating cavity.

[0017] According to the indoor unit of the wall-mounted air conditioner of the present application, the cleaning assembly

and the screen assembly are fixedly connected by the fastening structure, thereby improving the connection stability between the cleaning assembly and the screen assembly and further improving the engaging stability of the gear of the cleaning assembly and the screen; so that the defects such as misalignment, jamming, abnormal noise, etc. of the engaging transmission between the gear and the screen may be avoided in the process of washing, thereby improving the transmission reliability of the screen in the washing process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In order to more clearly illustrate the embodiments of the present application or the technical solutions in the prior art, the drawings to be used in the embodiments or the prior art description will be briefly described below. Obviously, the drawings in the following description are only certain embodiments of the present application, and other drawings may be obtained according to the structures shown in the drawings without any creative work for those skilled in the art.

FIG. 1 is a schematic structural view of an indoor unit of a wall-mounted air conditioner according to an embodiment of the present application;
FIG. 2 is a schematic view showing an internal structure of the indoor unit of the wall-mounted air conditioner in FIG. 1;
FIG. 3 is a partial enlarged view of a portion A in FIG. 2;
FIG. 4 is a schematic view showing an assembly structure of a screen assembly and a cleaning assembly in FIG. 2;
FIG. 5 is a partial enlarged view of a portion B in FIG. 4;
FIG. 6 is a schematic structural view of the cleaning assembly in FIG. 4;
FIG. 7 is a schematic structural view of the screen assembly in FIG. 4;
FIG. 8 is a partial enlarged view of a portion C in FIG. 7;
FIG. 9 is a schematic exploded structural view of the screen assembly in FIG. 7;
FIG. 10 is a schematic structural view of a chassis in FIG. 2; and
FIG. 11 is a partial enlarged view of a portion D in FIG. 10.

Description of the reference numerals:

[0019]

Reference numeral	Name	Reference numeral	Name
100	Indoor unit	223	First threaded hole
10	Chassis	225	Bottom bracket
11	Bottom wall	226	Screen bracket
111	Accommodating space	227	Air-inlet grille
12	Rear side wall	30	Cleaning assembly
121	Threaded hole column	31	Cleaning box
122	Second threaded hole	311	First buckle
123	Third buckle hole	312	Second buckle
20	Screen assembly	313	Third connecting member
21	Screen	3131	First via hole
211	Engaging member	314	Fourth connecting member
22	Grille assembly	3141	Second via hole
221	First connecting member	32	Roller brush assembly
2211	First buckle hole	321	Roller brush
222	Second connecting member	322	Gear
2221	Second buckle hole	40	Face frame

[0020] The implementation, functional features and advantages of the present application will be further described with reference to the accompanying drawings.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0021] The technical solutions in the embodiments of the present application are clearly and completely described in the following with reference to the drawings in the embodiments of the present application. It is obvious that the described embodiments are only a part of the embodiments of the present application, and not all of the embodiments. All other embodiments obtained by a person having ordinary skill in the art based on the embodiments of the present application without making any creative work fall within the scope of the present application.

[0022] It should be noted that, if there is a directional indicator (such as up, down, left, right, front, rear, ...) in the embodiment of the present application, it is only used to explain the relative position relationship and movement of the components in a particular posture (as shown in the attached drawings), and if the specific posture changes, the directional indicator will change accordingly.

[0023] In addition, if there is a description relating to "first", "second", etc. in the embodiments of the present disclosure, it is used for descriptive purposes only, and cannot be understood to indicate or imply its relative importance or to imply the number of technical features indicated. Thus, features defining "first" or "second" may include at least one of the features, either explicitly or implicitly. In addition, the meaning of "and/or" appearing throughout the text includes three parallel solutions, taking "A and/or B" as an example, it includes the A solution, or the B solution, or the solution in which both A and B are simultaneously satisfied. In addition, the technical solutions between the various embodiments may be combined with each other, but must be based on the realization of those skilled in the art, and when the combination of the technical solutions is contradictory or impossible to implement, it should be considered that the combination of the technical solutions does not exist, nor is it within the scope of protection required by the present disclosure.

[0024] The present application provides an indoor unit of a wall-mounted air conditioner.

[0025] In some embodiments of the present application, as shown in FIGS. 1-3, the indoor unit 100 of the wall-mounted air conditioner includes:

a chassis 10;
a screen assembly 20; and
a cleaning assembly 30 disposed at one end of the screen assembly 20 and connected with the screen assembly 20 by a fastening structure;
where the cleaning assembly 30 is mounted on the chassis 10, or the screen assembly 20 is mounted on the chassis 10, or the cleaning assembly 30 and the screen assembly 20 are both mounted on the chassis 10.

[0026] It will be understood that the fastening structure is a structure that securely connects the cleaning assembly 30 and the screen assembly 20, which is configured to improve the connection stability between the cleaning assembly 30 and the screen assembly 20.

[0027] Specifically, when the indoor unit 100 of the wall-mounted air conditioner is assembled, the cleaning assembly 30 and the screen assembly 20 are connected by the fastening structure, and a gear 322 of the cleaning assembly 30 and a screen 21 of the screen assembly 20 are simultaneously engaged (where the screen 21 is provided with an engaging member 211 configured for engaging with the gear 322); then, the cleaning assembly 30 together with the screen assembly 20 are mounted on the chassis 10. As such, the cleaning assembly 30 and the screen assembly 20 are fixedly connected by the fastening structure, thereby improving the connection stability between the cleaning assembly 30 and the screen assembly 20 and further improving the engaging stability of the gear 322 of the cleaning assembly 30 and the screen 21 of the screen assembly 20; so that the defects such as misalignment, jamming, abnormal noise, etc. of the engaging transmission between the gear 322 and the screen 21 may be avoided in the process of washing, thereby improving the transmission reliability of the screen 21 in the washing process.

[0028] Namely, according to the indoor unit 100 of the wall-mounted air conditioner of the present application, the cleaning assembly 30 and the screen assembly 20 are fixedly connected by the fastening structure, thereby improving the connection stability between the cleaning assembly 30 and the screen assembly 20 and further improving the engaging stability of the gear 322 of the cleaning assembly 30 and the screen 21; so that the defects such as misalignment, jamming, abnormal noise, etc. of the engaging transmission between the gear 322 and the screen 21 may be avoided in the process of washing, thereby improving the transmission reliability of the screen 21 in the washing process.

[0029] Secondly, the cleaning assembly 30 and the screen assembly 20 are fixedly connected by the fastening structure, so that loosening of the engaged gear 322 and the screen 21 due to changed relative position of the cleaning assembly 30 and the screen assembly 20 caused by shaking and/or collision during transportation may be avoided.

[0030] In addition, the assembly sequence of the indoor unit 100 of the wall-mounted air conditioner is: the cleaning assembly 30 and the screen assembly 20 are first fixedly connected by the fastening structure, and then the cleaning assembly 30 together with the screen assembly 20 are mounted on the chassis 10. The above assembly sequence is very convenient for checking the connection points on the production line.

[0031] In a specific embodiment, there may be various specific structures of the fastening structure, as long as the

cleaning assembly 30 and the screen assembly 20 may be securely connected together to stabilize the relative positions of the two. For example, the fastening structure may include one or more of a snap structure, a threaded structure, a pin connection structure, a welded connection structure, etc. The fastening structure will be exemplified below, and it will be understood that many fastening structures are readily apparent to those skilled in the art on the basis of the following examples.

[0032] Further, the fastening structure is a detachable structure. As such, inspection, repair, replacement, etc. of the cleaning assembly 30 and/or the screen assembly 20 may be facilitated.

[0033] In some embodiment, as shown in FIGS. 6-9, the screen assembly 20 includes a screen 21 and a grille assembly 22. The cleaning assembly 30 includes a cleaning box 31 and a roll brush assembly 32 mounted on the cleaning box 31, and the gear 322 is a part of the roller brush assembly 32. The screen 21 is provided with an engaging member 211 for engaging with the gear 322. Specifically, the fastening structure connects the cleaning box 31 and the grille assembly 22.

[0034] In some embodiments, as shown in FIG. 7, the grille assembly 22 is substantially rectangular.

[0035] Further, as shown in FIGS. 4 and 5, the fastening structure includes a first buckle structure and a first threaded structure. As such, the combination of the buckle structure and the threaded structure to secure the cleaning assembly 30 and the screen assembly 20 not only facilitates positioning during assembly, but also improves the stability of the connection between the cleaning assembly 30 and the screen assembly 20. In addition, it is also advantageous to simplify the structure of the fastening structure.

[0036] Certainly, the fastening structure may also include a first buckle structure only or a first threaded structure only.

[0037] Further, as shown in FIGS. 4 and 5, the cleaning box 31 is disposed below the grille assembly 22, and a first connecting member 221 extends downwardly from one end of the grille assembly 22.

[0038] The first buckle structure includes a first buckle hole 2211 defined in the first connecting member 221 and a first buckle 311 protruded from the cleaning box 31. The first buckle 311 is adaptively engaged in the first buckle hole 2211. Optionally, the first buckle 311 is disposed in an outer side of the cleaning box 31.

[0039] Specifically, as shown in FIG. 6, the cleaning box 31 is substantially rectangular. In FIGS. 2 and 3, the first buckle 311 is disposed in a left side of the cleaning box 31.

[0040] As such, the end of the grille assembly 22 may be constrained and connected to the left lateral side of the cleaning box 31.

[0041] It can be understood that the first buckle 311 may also be disposed in the first connecting member 221, and correspondingly, the first buckle hole 2211 may be defined in the cleaning box 31. Namely, the first buckle structure includes the first buckle hole 2211 defined in the cleaning box 31, and the first buckle 311 protruded from the first connecting member 221, where the first buckle 311 is adaptively engaged in the first buckle hole 2211.

[0042] Specifically, as shown in FIGS. 7 and 8, the first connecting member 221 may be provided in a plate shape. As such, the structure and manufacturing process of the first connecting member 221 may be simplified.

[0043] Specifically, a side surface of the first buckle 311 toward the first buckle hole 2211 is obliquely extended to guide the engagement between the first connecting member 221 and the cleaning box 31.

[0044] Further, as shown in FIG. 2, FIG. 7 and FIG. 8, two of the first connecting members 221 are provided at intervals along a front-rear direction, and each first connecting member 221 defines the first buckle hole 2211 respectively, and two of the first buckles 311 are provided accordingly. As such, the connection strength and the connection stability may be improved.

[0045] Further, as shown in FIGS. 4-8, a second connecting member 222 extends downwardly from a front portion of the grille assembly 22. The first buckle structure further includes a second buckle hole 2221 defined in the second connecting member 222 and a second buckle 312 protruded from the cleaning box 31. The second buckle 312 is adaptively engaged in the second buckle hole 2221. Optionally, the second buckle 312 is disposed in an outer side of the cleaning box 31.

[0046] Specifically, in FIGS. 2 and 3, the second buckle 312 is disposed in a front side of the cleaning box 31.

[0047] As such, the front portion of the grille assembly 22 may be constrained and connected with the front lateral side of the cleaning box 31.

[0048] It can be understood that the second buckle 312 may also be disposed in the second connecting member 222, and correspondingly, the second buckle hole 2221 is defined in the cleaning box 31. Namely, the first buckle structure further includes the second buckle hole 2221 defined in the cleaning box 31, and the second buckle 312 protruded from the second connecting member 222, where the second buckle 312 is adaptively engaged in the second buckle hole 2221.

[0049] Specifically, as shown in FIGS. 7 and 8, the second connecting member 222 may be provided in a plate shape. As such, the structure and manufacturing process of the second connecting member 222 may be simplified.

[0050] Specifically, a side surface of the second buckle 311 toward the second buckle hole 2211 is obliquely extended to further guide the engagement between the first connecting member 221 and the cleaning box 31.

[0051] Further, as shown in FIGS. 7 and 8, two of the second connecting members 222 are provided at intervals along a length direction of the screen assembly 20 (namely the left-right direction in FIG. 2), and each second connecting

member 222 defines a second buckle hole 2221 respectively, and two of the second buckle 312 are provided accordingly. As such, the connection strength and the connection stability may be improved.

[0052] It can be understood that the first connecting member 221 extends downwardly from the end of the grille assembly 22, and the first buckle hole 2211 is defined in the first connecting member 221 to be engaged with the first buckle 311 disposed in the cleaning box 31, so that the end of the grille assembly 22 and the left lateral side of the cleaning box may be constrained and connected. Further, the second connecting member 222 extends downwardly from the front portion of the grille assembly 22, and the second buckle hole 2221 is defined in the second connecting member to be engaged with the second buckle 312 disposed in the cleaning box, so that the front portion of the grille assembly 11 and the front lateral side of the cleaning box 31 may be constrained and connected. As such, the cleaning box 31 and the grille assembly 22 may be fastened.

[0053] It should be noted that, the first buckle structure may also be set in other structural forms according to the first buckle structure mentioned above, which will not be detailed here.

[0054] Further, as shown in FIGS. 4-6, a third connecting member 313 extends upwardly from an edge of an opening of the cleaning box 31, where the first threaded structure includes a first locking screw (not shown), and the first locking screw penetrates the third connecting member 313 and is threaded with one end of the grille assembly 22, so as to connect the cleaning box 31 and the grille assembly 22.

[0055] Specifically, as shown in FIGS. 4-6, the first threaded structure further includes a first via hole 3131 defined in the third connecting member 313, and a first threaded hole 223 defined in an end surface of the grille assembly 22, where the first locking screw penetrates the first via hole 3131 and is threaded to the first threaded hole 223.

[0056] It can be understood that an end surface where the first threaded hole 223 located is an end surface of an end where the first connecting member 221 located, and the third connecting member 313 is disposed on a left lateral side of the cleaning box 31.

[0057] As such, the strength of the connection between the cleaning box 31 and the grille assembly 22 may be further enhanced to further improve the stability of the connection between the cleaning assembly 30 and the screen assembly 20.

[0058] Specifically, as shown in FIGS. 2 and 3, the third connecting member 313 is disposed on a rear side of the edge of the opening of the cleaning box 31, and the first threaded hole 223 is defined in a rear side of the end face.

[0059] Further, the first via hole 3131 may be a threaded hole. As such, the connection ability of the first threaded structure may be improved, so as to improve the connection stability between the cleaning box 31 and the grille assembly 22.

[0060] It can be understood that the first locking screw may also be replaced by a bolt or the like.

[0061] It should be noted that, the first threaded structure may also be set in other structural forms according to the first threaded structure mentioned above, which will not be detailed here.

[0062] Further, as shown in FIG. 10, the chassis 10 includes a bottom wall 11 and a rear side wall 12 connected to a rear side of the bottom wall 11.

[0063] Specifically, the bottom wall 11 and the rear side wall 12 may be integrally formed.

[0064] As shown in FIG. 10, the bottom wall 11 defines an accommodating space 111, and a lower portion of the cleaning assembly 30 is mounted in the accommodating space 111.

[0065] Specifically, a lower portion of the cleaning box 31 is mounted in the accommodating space 111.

[0066] As such, a lower portion of the cleaning assembly 30 may be restrained to ensure mounting stability between the cleaning assembly 30 and the screen assembly 20 on the chassis 10.

[0067] Specifically, as shown in FIG. 10, two limit plates (not labeled) are provided at intervals on the bottom wall 11 in the length direction of the chassis 10 (namely the left-right direction in FIG. 10), and the two limit plates and the rear side walls 12 are enclosed to define the accommodating space 111 cooperatively. As such, the structure of the accommodating space 111 may be simplified.

[0068] Certainly, the accommodating space 111 may also be set to other structural forms.

[0069] Further, as shown in FIGS. 2, 3, and 10, an upper portion of the cleaning assembly 30 is connected with the rear side wall 12 by a second threaded structure, and/or the screen assembly 20 is connected with the rear side wall 12 by a second buckle structure.

[0070] Specifically, an upper portion of the cleaning box 31 is connected with the rear side wall 12 by a second threaded structure, and/or the grille assembly 22 is connected with the rear side wall 12 by a second buckle structure.

[0071] As such, an upper portion of the cleaning assembly 30 may be restrained to further ensure mounting stability between the cleaning assembly 30 and the screen assembly 20 on the chassis 10.

[0072] In some embodiments of the present application, as shown in FIGS. 2, 3, and 10, an upper portion of the cleaning assembly 30 is connected with the rear side wall 12 by a second threaded structure, and the screen assembly 20 is connected with the rear side wall 12 by a second buckle structure. As such, not only the mounting stability between the cleaning assembly 30 and the screen assembly 20 on the chassis 10 may be further improved and shaking during transportation may be avoided; but also the installation difficulty may be reduced during installation, since the upper portion of the cleaning assembly 30 may be firstly fixed through the second buckle structure and then the second threaded

structure is installed.

[0073] Further, as shown in FIGS. 2, 3, and 10, a fourth connecting member 314 is protruded from the cleaning box 31 and extended away from the other end of the screen assembly 20. The second threaded structure includes a second locking screw (not shown), and the second locking screw penetrates the fourth connecting member 314 and is threaded with the rear side wall 12. Optionally, the fourth connecting member 314 is disposed on an outer lateral side of the cleaning box 31.

[0074] Specifically, the second threaded structure further includes a second via hole 3141 defined in the fourth connecting member 314 and a second threaded hole 122 defined in the rear side wall 12. The second locking screw penetrates the second via hole 3141 and is threaded into the second threaded hole 122.

[0075] As such, the upper portion of the cleaning box 31 may be mounted on the chassis 10.

[0076] Specifically, in FIGS. 3 and 4, the fourth connecting member 314 is disposed on the left lateral side of the cleaning box 31.

[0077] Specifically, as shown in FIG. 10 and FIG. 11, a threaded hole column 121 may be protruded from the rear side wall 12, and the second threaded hole 122 may be defined in the threaded hole column121.

[0078] Further, the second via hole 3141 may be a threaded hole. As such, the connection ability of the second threaded structure may be improved, so as to improve the connection stability between the cleaning box 31 and the chassis 10.

[0079] It can be understood that the second locking screw may also be replaced by a bolt or the like.

[0080] Further, as shown in FIG. 2, FIG. 3 and FIG. 10, the second buckle structure includes a third buckle hole 123 defined in the rear side wall 12 and an inserting buckle protruded from the screen assembly 20 (not shown), and the inserting buckle is inserted into the third fastening buckle 123. Optionally, the inserting buckle is disposed on an outer side of the screen assembly 20.

[0081] Specifically, the inserting buckle may be disposed on an outer side of the grille assembly 22.

[0082] As such, the screen assembly 20 may be mounted on the chassis 10 to improve mounting stability between the cleaning assembly 30 and the screen assembly 20 on the chassis 10.

[0083] In some embodiments, the inserting buckle may be disposed on a rear side of the grille assembly 22.

[0084] It can be understood that the inserting buckle may also be disposed on the rear side wall 12, and correspondingly, the third buckle hole 123 may be defined in the screen assembly 20. Namely, the second buckle structure includes the third buckle hole 123 defined in the screen assembly 20 and the inserting buckle protruded from the rear side wall 12, and the inserting buckle is inserted into the third buckle hole 123.

[0085] Further, a plurality of the third buckle holes 123 are provided at intervals in the length direction of the chassis 10 (namely the left-right direction in FIG. 10), and a plurality of inserting buckles are correspondingly provided. As such, the mounting stability between the screen assembly 20 and the chassis 10 may be improved.

[0086] Further, as shown in FIGS. 2, 3, 6, and 10, the fourth connecting member 314 may be integrally formed on a rear side edge of the third connecting member 313. As such, the structure of the cleaning box 31 may be simplified.

[0087] Further, the engaging member 211 may be a rack. Thus, the engaging between the engaging member 211 and the gear 322 may be achieved.

[0088] Specifically, two of the racks may be provided and disposed on both sides of the screen 21 respectively.

[0089] Certainly, the engaging member 211 may also be set to other structural forms. For example, the engaging member 211 defines at least one engaging hole for engaging with the gear 322.

[0090] Further, as shown in FIG. 1, the indoor unit 100 of the wall-mounted air conditioner further includes a face frame 40 detachably mounted on the chassis 10, where the face frame 40 and the chassis 10 defines an accommodating cavity (not labeled) cooperatively, and the screen assembly 20 and the cleaning assembly 30 are mounted in the accommodating cavity.

[0091] Specifically, when the indoor unit 100 of the wall-mounted air conditioner is assembled, the face frame 40 is mounted after the cleaning assembly 30 and the screen assembly 20 are mounted on the chassis 10.

[0092] Specifically, the face frame 40 defines an air outlet corresponding to the screen assembly 20.

[0093] Specifically, as shown in FIG. 6, the roller brush assembly 32 generally includes a roller brush 321 rotatably mounted at the opening of the cleaning box 31, and two gears 322 mounted on both ends of the roller brush 321. The roller brush 321 is used to clean the screen 21. The gear 322 is used to engage with the screen 21 to drive the screen 21 to move.

[0094] In some embodiments, the roller brush 321 includes a roller (not labeled) rotatably mounted on the cleaning box 31, and a brush (not labeled) wound on the roller, where the gear 322 is mounted on roller.

[0095] In some embodiments, the cleaning assembly 30 further includes a water-washing power assembly mounted on the cleaning box 31 for driving the roller to rotate.

[0096] The specific structure of the water-washing power assembly may be referred to related documents, and will not be repeated here.

[0097] Further, the grille assembly 22 defines two accommodating sliding slots (not shown) at intervals in the up-down

direction. The screen 21 is slidably mounted in one of the accommodating sliding slots. The opening of the accommodating sliding slot is disposed adjacent to the roller brush assembly 32, and one end of the screen 21 protrudes from the opening to engage the engaging member 211 of the screen 21 with the gear 322.

[0098] When the screen 21 is needed to be washed, the gear 322 on the roller may be driven to rotate, so as to drive the gear 322 to drive the screen 21 to slide in the accommodating sliding slot. And one end of the screen 21 bypasses the roller 321 to enter the other accommodating sliding slot, the screen 21 is cleaned by the roller brush 321 during the process.

[0099] Further, as shown in FIG. 9, the grille assembly 22 includes a bottom bracket 225, a screen bracket 226, and an air inlet grille 227 which are sequentially stacked, and the screen bracket 226 is disposed between the bottom bracket 225 and the air inlet grille 227. One of the accommodating sliding slot is defined between the air inlet grille 227 and the screen 21 bracket, and the other accommodating sliding slot is defined between the bottom bracket 225 and the screen bracket 226.

[0100] Specifically, as shown in FIGS. 7-9, the first connecting member 221 and the second connecting member 222 are both disposed on the air inlet grille 227.

[0101] Other structures of the indoor unit 100 of the wall-mounted air conditioner may be referred to the related designs, and will not be described herein.

[0102] The above description refers to only optional embodiments of the present disclosure, and thus does not limit the scope of the present disclosure, and any transformation of equivalent structure made under the inventive concept of the present disclosure by using the contents of this specification and attached drawings, or direct/indirect application in other relevant technical fields, shall be included in the scope of the present disclosure.

Claims

1. An indoor unit of a wall-mounted air conditioner, **characterized by** comprising:

a chassis;
a screen assembly; and
a cleaning assembly disposed at one end of the screen assembly and connected with the screen assembly by a fastening structure;

wherein the cleaning assembly is mounted on the chassis, or the screen assembly is mounted on the chassis, or the cleaning assembly and the screen assembly are both mounted on the chassis.

2. The indoor unit of the wall-mounted air conditioner according to claim 1, **characterized in that**, the fastening structure is a detachable structure.

3. The indoor unit of the wall-mounted air conditioner according to claim 2, **characterized in that**, the fastening structure comprises:
a first buckle structure;
or the fastening structure comprises:
a first threaded structure;
or the fastening structure comprises:

a first buckle structure; and
a first threaded structure.

4. The indoor unit of the wall-mounted air conditioner according to claim 3, **characterized in that**, the screen assembly comprises:
a grille assembly comprising a first connecting member extending downwardly from one end of the grille assembly, and
wherein the cleaning assembly comprises:
a cleaning box disposed below the grille assembly;
wherein the first buckle structure comprises:

a first buckle hole defined in the first connecting member; and
a first buckle protruded from the cleaning box;

or the first buckle structure comprises:

a first buckle protruded from the first connecting member; and
a first buckle hole defined in the cleaning box;

wherein the first buckle is adaptively engaged in the first buckle hole.

5. The indoor unit of the wall-mounted air conditioner according to claim 4, **characterized in that**, the first connecting member is provided in a plate shape.

6. The indoor unit of the wall-mounted air conditioner according to claim 4, **characterized in that**, a side surface of the first buckle toward the first buckle hole is obliquely extended.

7. The indoor unit of the wall-mounted air conditioner according to claim 4, **characterized in that**, two of the first connecting members are provided at intervals along a front-rear direction, and each first connecting member defines the first buckle hole respectively.

8. The indoor unit of the wall-mounted air conditioner according to claim 4, **characterized in that**, the grille assembly comprises:
a second connecting member extending downwardly from a front portion of the grille assembly;
wherein the first buckle structure further comprises:

a second buckle hole defined in the second connecting member; and
a second buckle protruded from the cleaning box;

or the first buckle structure further comprises:

a second buckle protruded from the second connecting member; and
a second buckle hole defined in the cleaning box;

wherein the second buckle is adaptively engaged in the second buckle hole.

9. The indoor unit of the wall-mounted air conditioner according to claim 8, **characterized in that**, the second connecting member is provided in a plate shape.

10. The indoor unit of the wall-mounted air conditioner according to claim 8, **characterized in that**, a side surface of the second buckle toward the second buckle hole is obliquely extended.

11. The indoor unit of the wall-mounted air conditioner according to claim 8, **characterized in that**, two of the second connecting members are provided at intervals along a length direction of the screen assembly, and each second connecting member defines the second buckle hole respectively.

12. The indoor unit of the wall-mounted air conditioner according to claim 3, **characterized in that**, the screen assembly comprises:
a grille assembly, and
wherein the cleaning assembly comprises:
a cleaning box disposed below the grille assembly and comprising a third connecting member extending upwardly from anedge of an opening of the cleaning box, and
wherein the first threaded structure comprises:
a first locking screw penetrating the third connecting member and threaded with one end of the grille assembly.

13. The indoor unit of the wall-mounted air conditioner according to claim 12, **characterized in that**, the third connecting member is disposed at a rear side of the opening of the cleaning box.

14. The indoor unit of the wall-mounted air conditioner according to claim 1, **characterized in that**, the chassis comprises:

a bottom wall defining an accommodating space; and

a rear side wall connected to a rear side of the bottom wall,

wherein a lower portion of the cleaning assembly is mounted in the accommodating space; and
wherein an upper portion of the cleaning assembly is connected with the rear side wall by a second threaded structure; or
the screen assembly is connected with the rear side wall by a second buckle structure; or
an upper portion of the cleaning assembly is connected with the rear side wall by a second threaded structure, and the screen assembly is connected with the rear side wall by a second buckle structure.

15. The indoor unit of the wall-mounted air conditioner according to claim 14, **characterized in that**,
the cleaning assembly comprises:
a fourth connecting member protruded from the cleaning box, and extended away from the other end of the screen assembly; and wherein the second threaded structure comprises:
a second locking screw penetrating the fourth connecting member and threaded with the rear side wall; and/or
wherein the second buckle structure comprises:

a third buckle hole defined in the rear side wall; and
an inserting buckle protruded from the screen assembly; or

the second buckle structure comprises:

an inserting buckle protruded from the rear side wall; and
a third buckle hole defined in the screen assembly;

wherein the inserting buckle is inserted into the third buckle hole.

16. The indoor unit of the wall-mounted air conditioner according to claim 15, **characterized in that**,
the second threaded structure further comprises:

a second via hole defined in the fourth connecting member; and
a second threaded hole defined in the rear side wall,

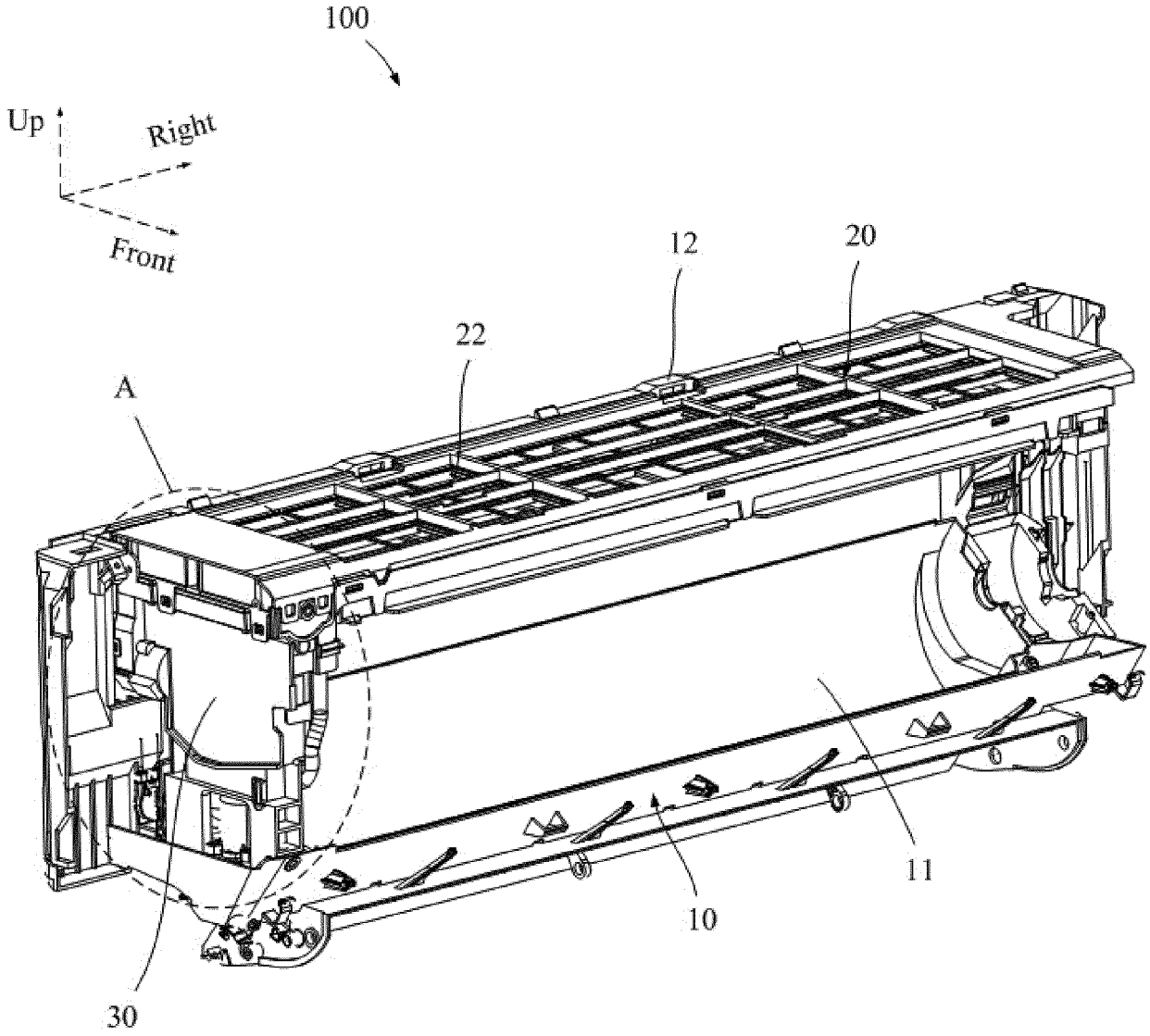
wherein the second locking screw is penetrated the second via hole and is threaded into the second threaded hole; and
wherein a threaded hole column is protruded from the rear side wall, and the second threaded hole is defined in the threaded hole column.

17. The indoor unit of the wall-mounted air conditioner according to claim 15, **characterized in that**,
the fourth connecting member is integrally formed on a rear side edge of the third connecting member.

18. The indoor unit of the wall-mounted air conditioner according to claim 15, **characterized in that**,
the bottom wall and the rear side wall are integrally formed.

19. The indoor unit of the wall-mounted air conditioner according to claim 1, **characterized in that**,
a gear of the cleaning assembly is engaged with an engaging member of a screen of the screen assembly,
wherein the engaging member is a rack;
or the engaging member defines at least one engaging hole.

20. The indoor unit of the wall-mounted air conditioner according to claim 1, **characterized by** further comprising:
a face frame detachably mounted on the chassis,
wherein the face frame and the chassis defines an accommodating cavity cooperatively, and the screen assembly and the cleaning assembly are mounted in the accommodating cavity.


100
Up
Right
Front
12
20
22
A
30
10
11

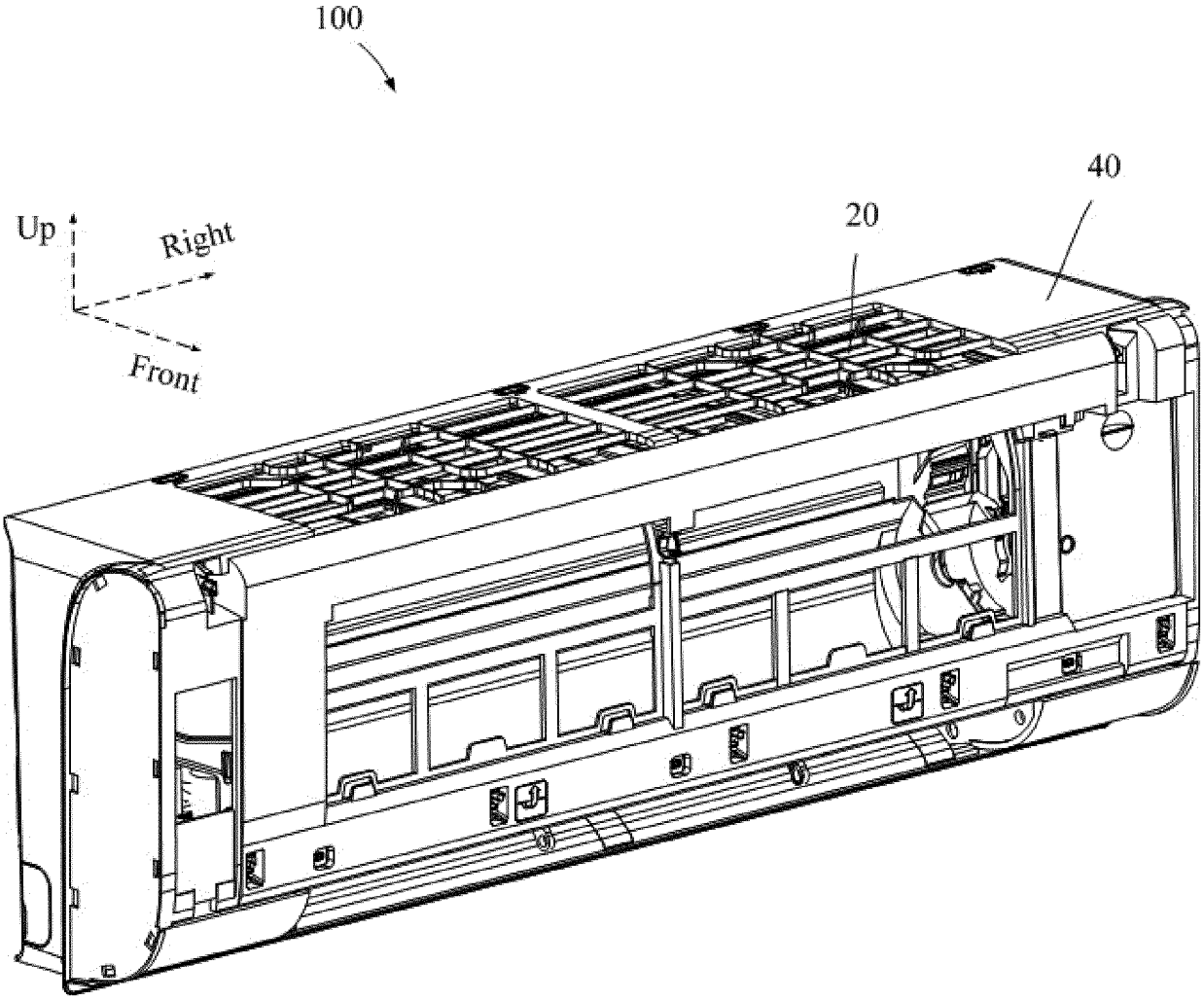


FIG. 1

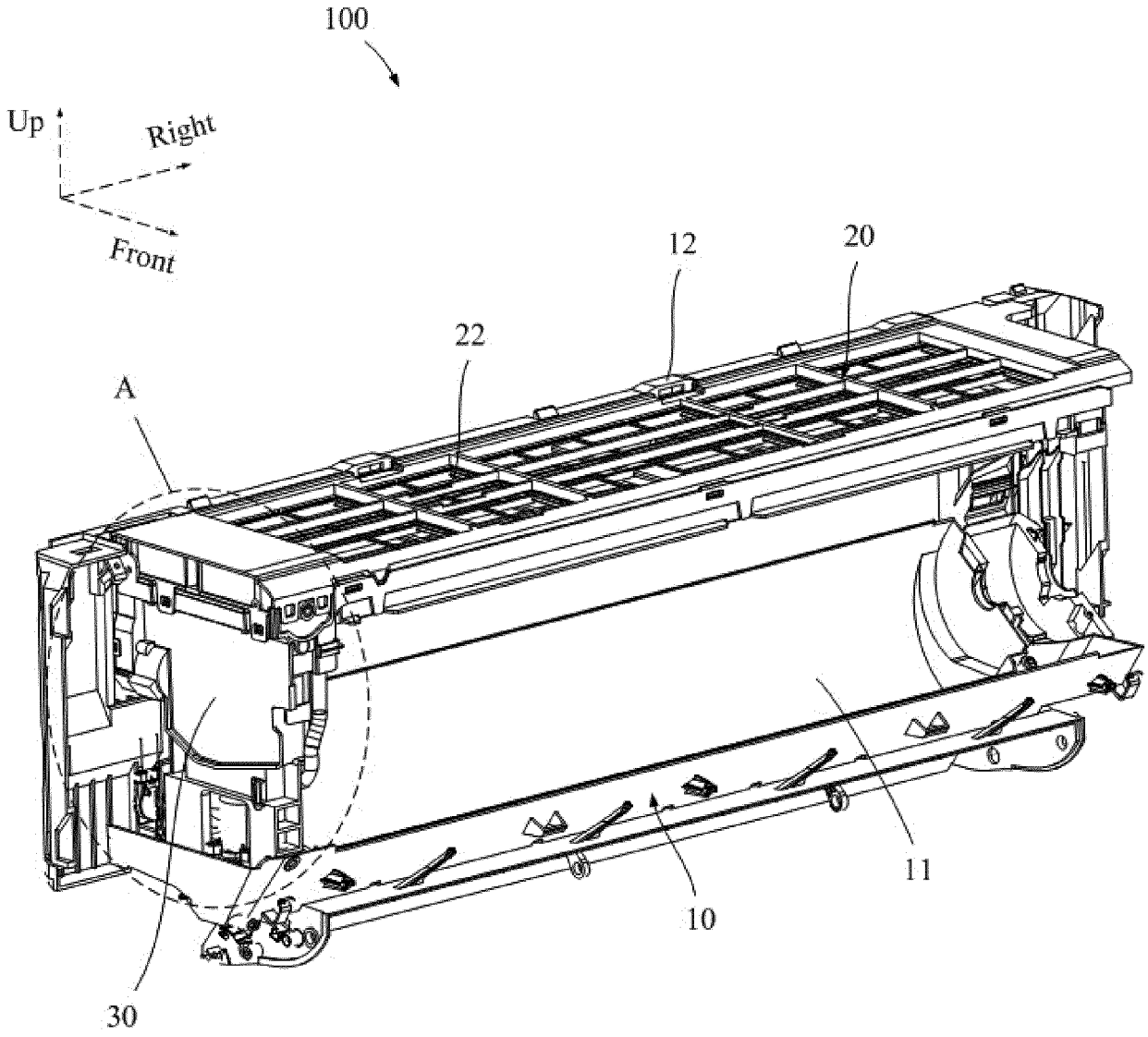


FIG. 2

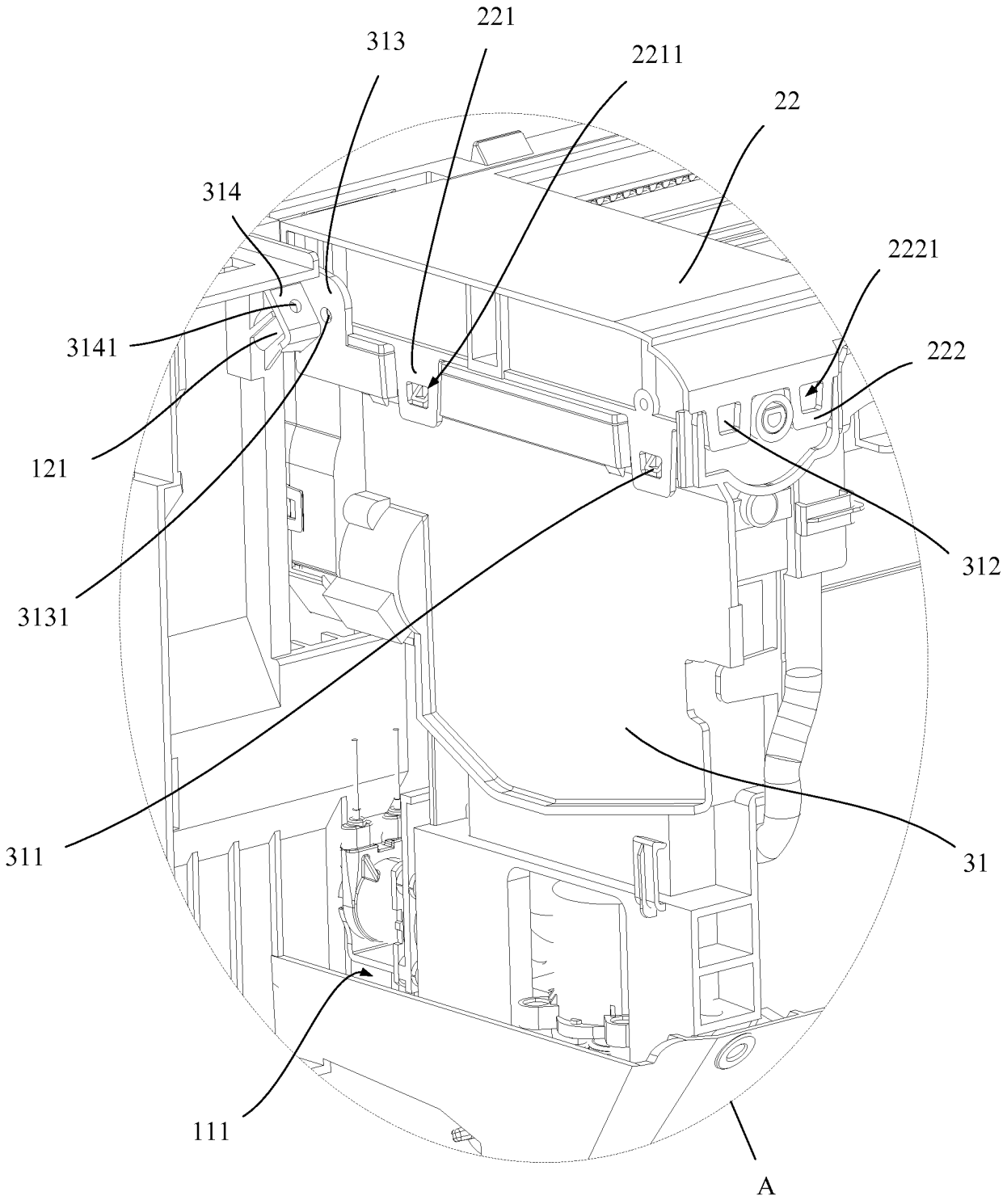


FIG. 3

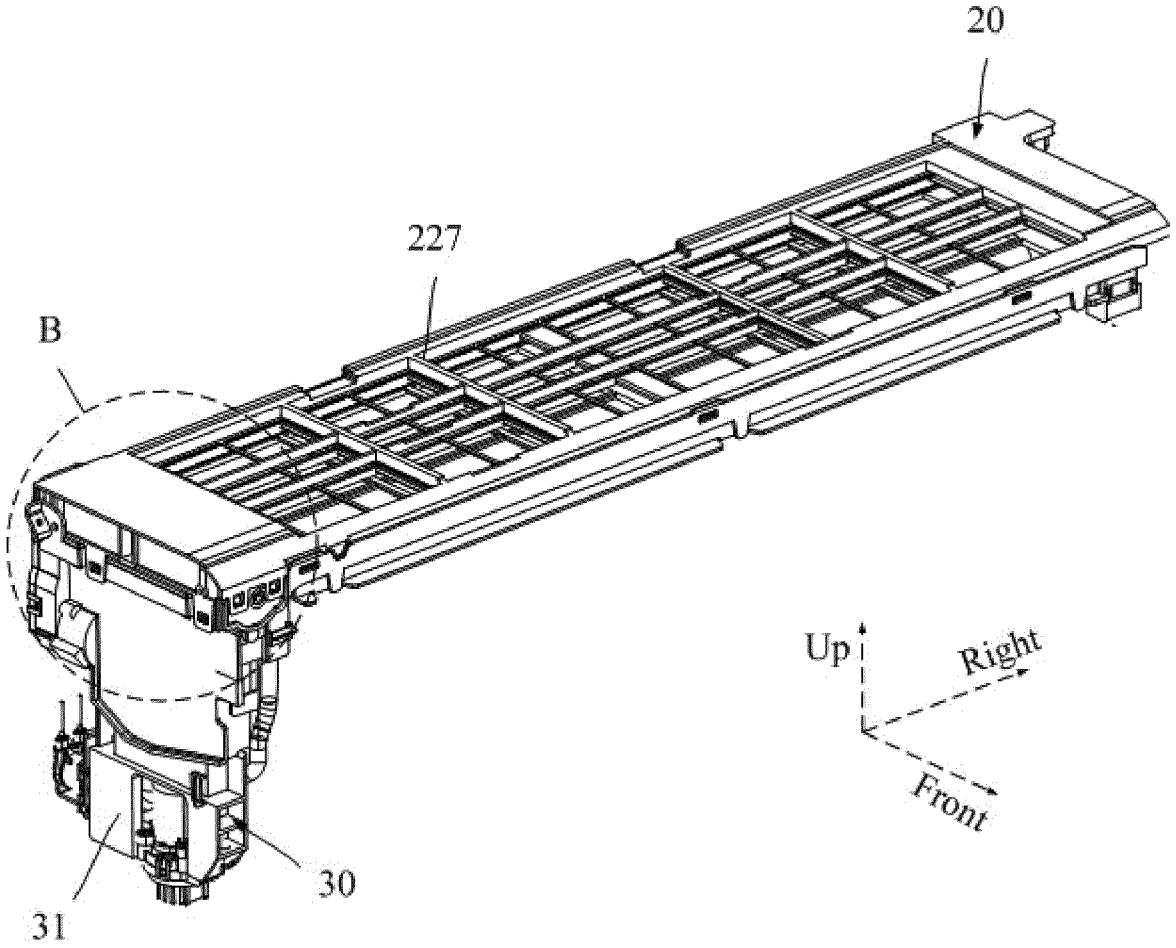


FIG. 4

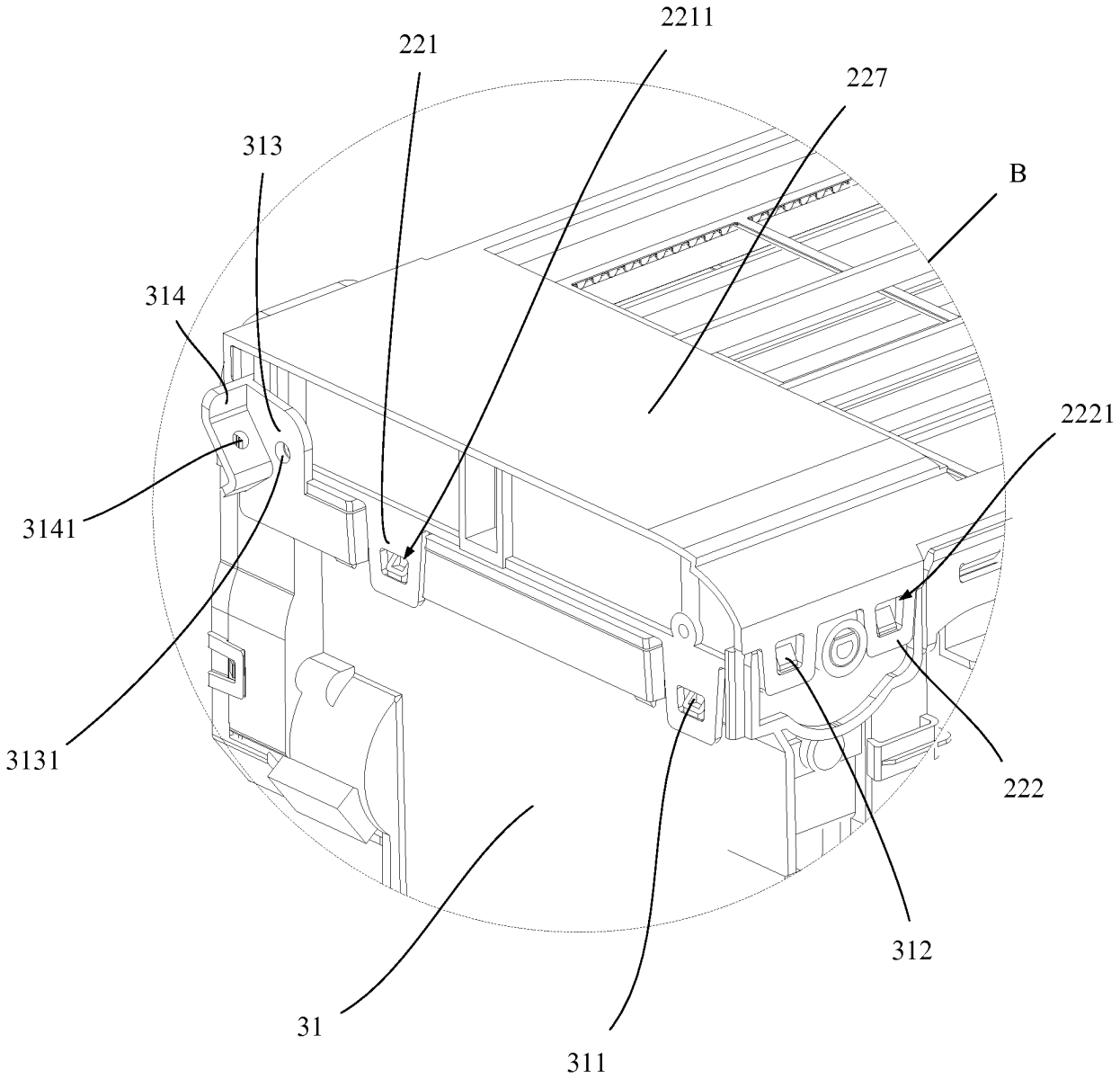


FIG. 5

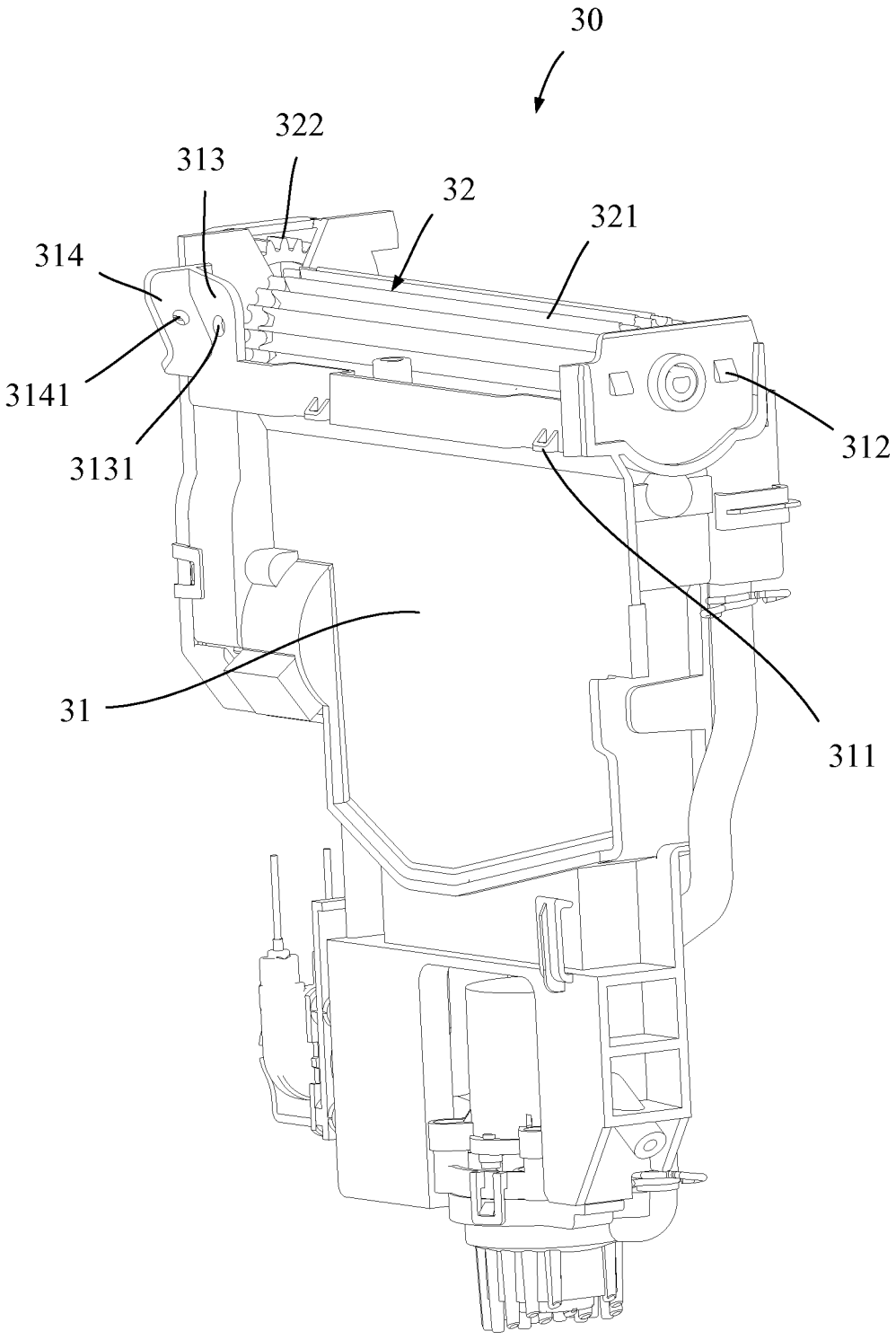


FIG. 6

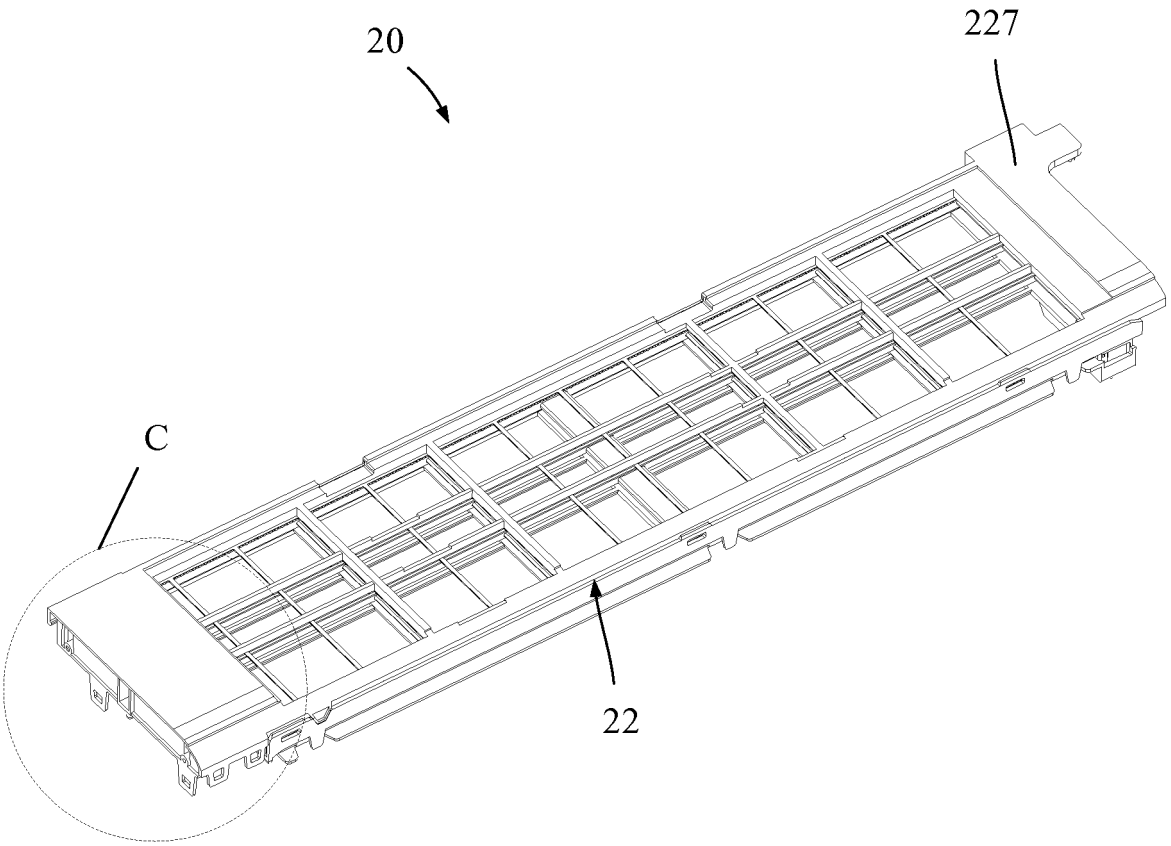


FIG. 7

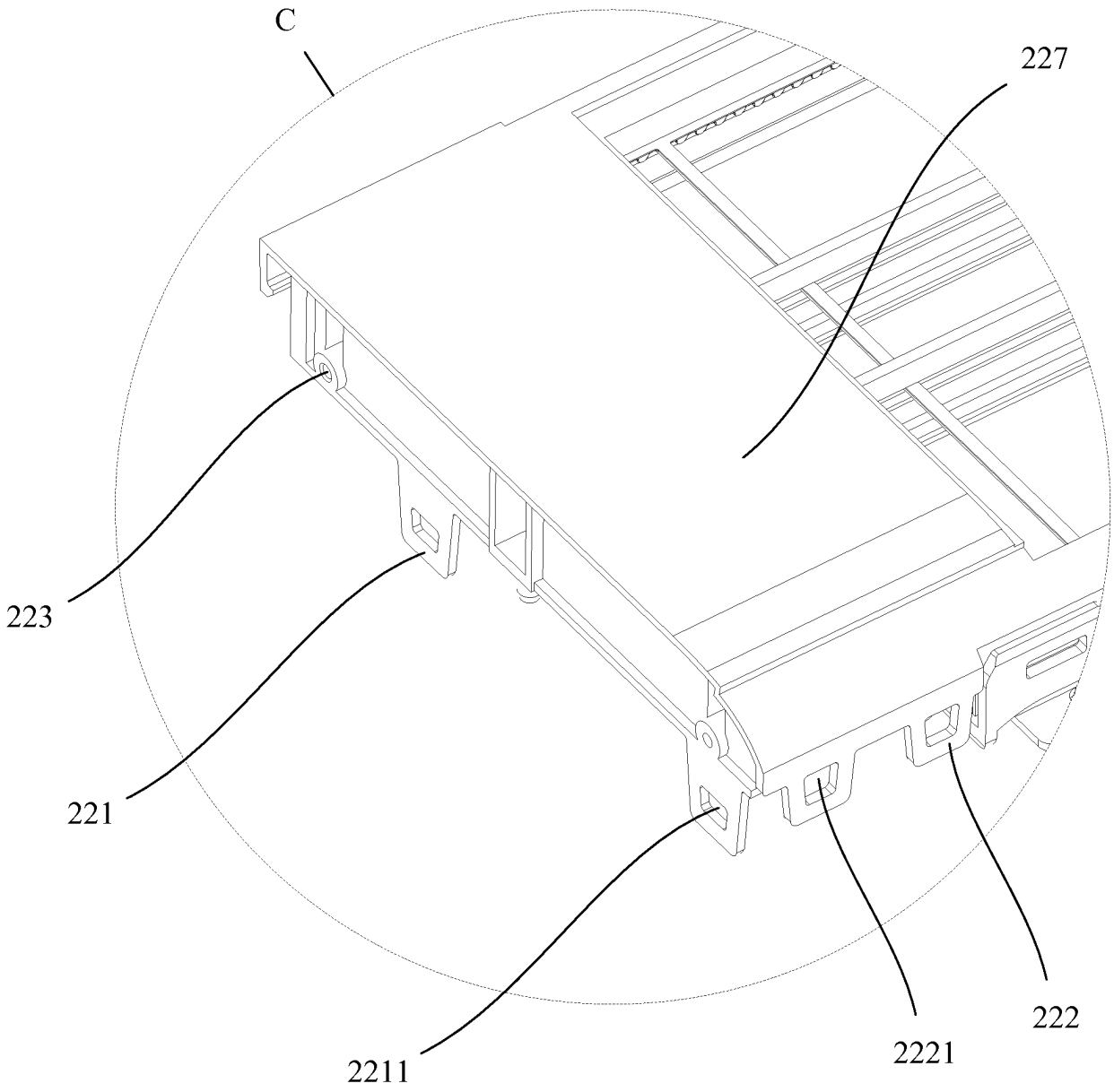


FIG. 8

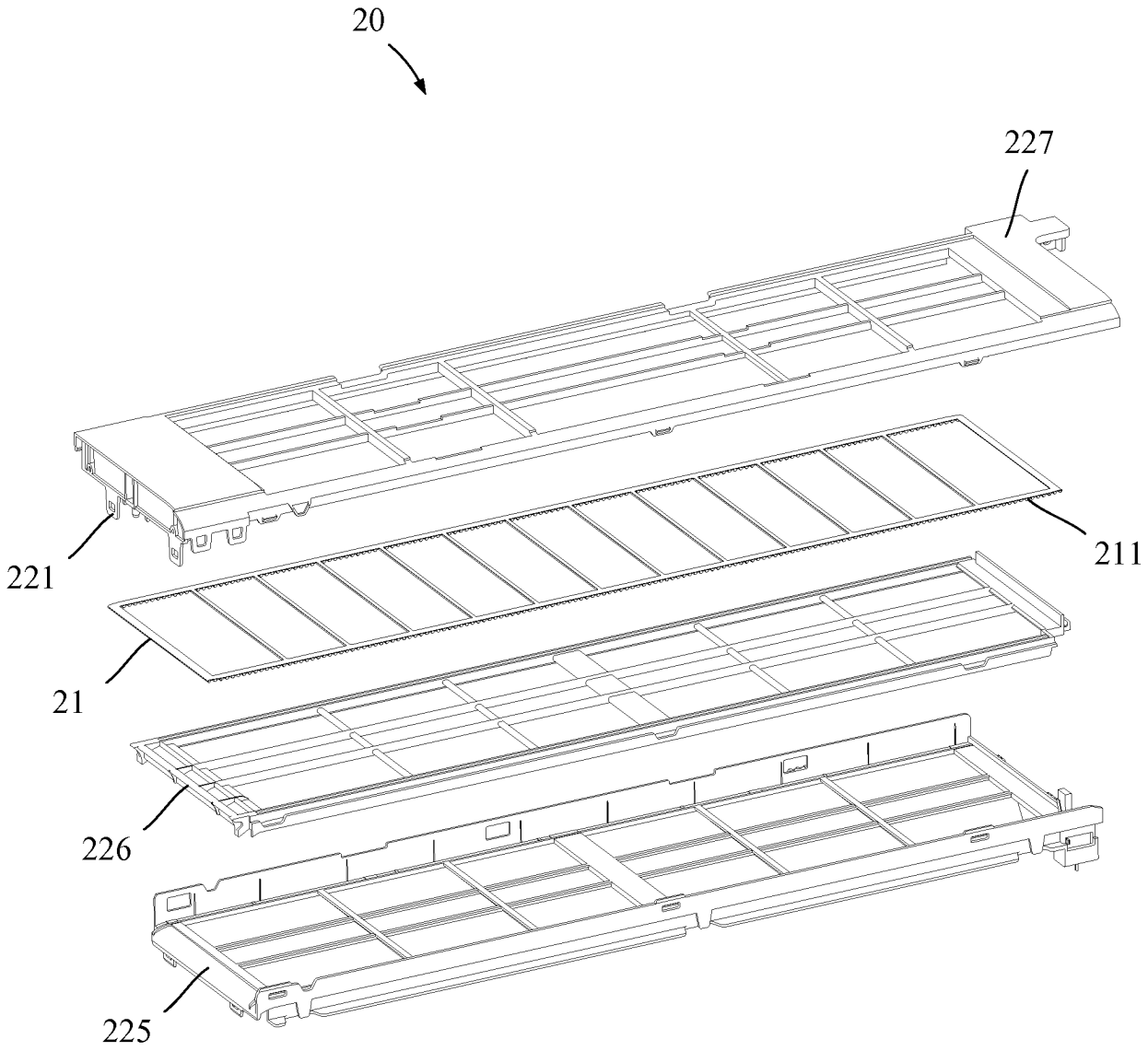


FIG. 9

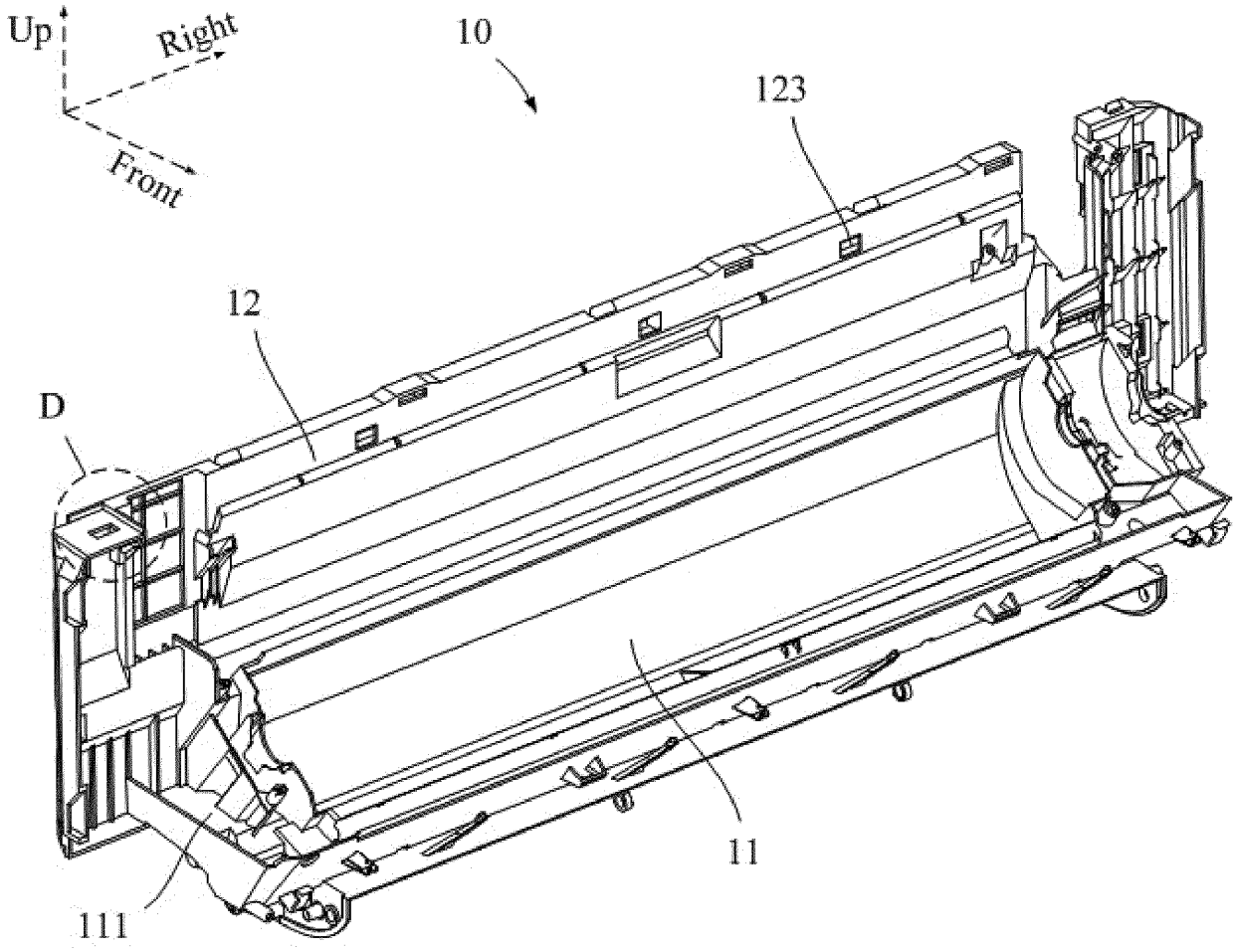


FIG. 10

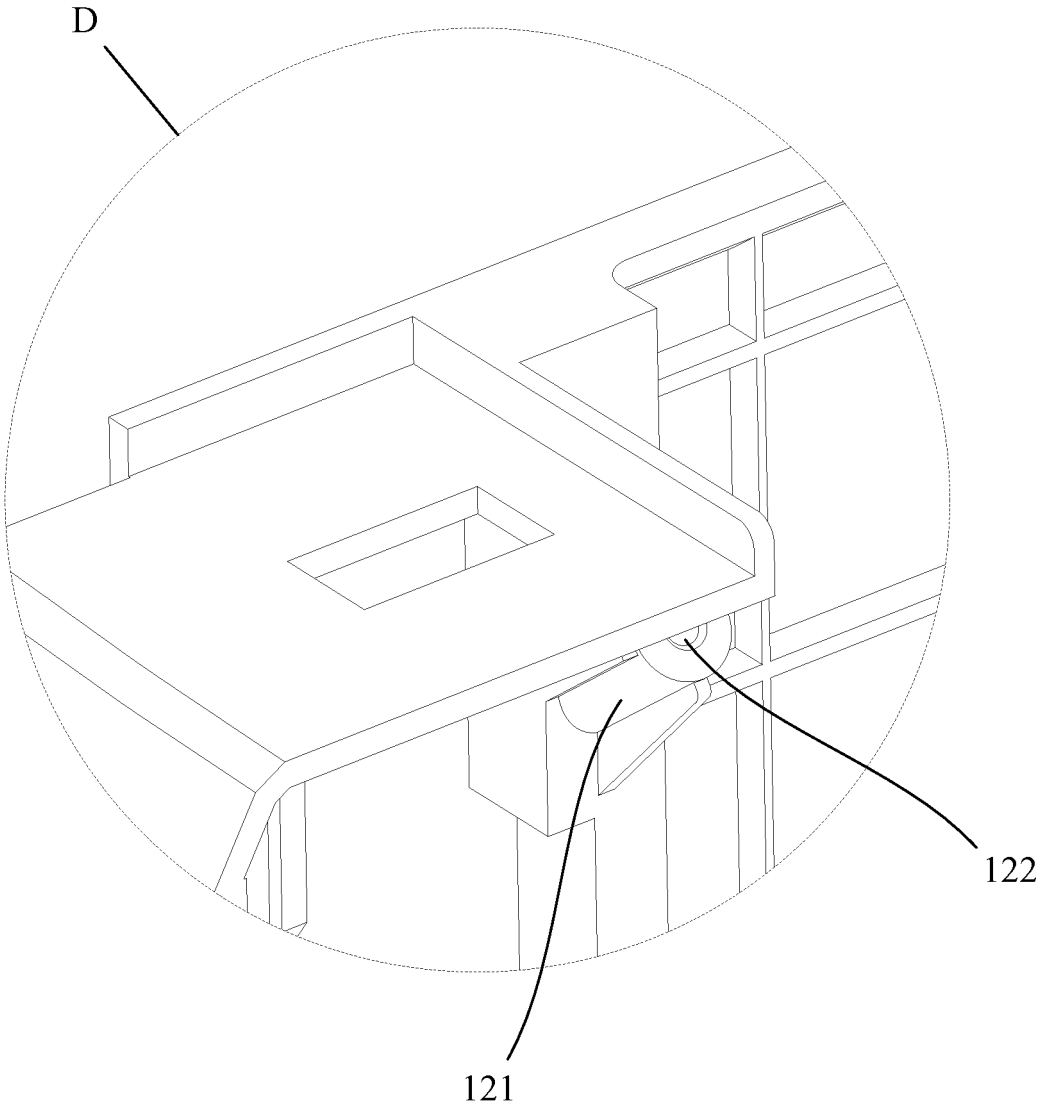


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/112431

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/0073(2019.01)i; F24F 13/28(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)

F24F

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)

DWPI; SIPOABS; CNABS; CNTXT; 中国期刊网全文数据库; CJFD: 除尘, 室内机, 美的, 螺纹, 螺接, 壁挂式空调室内机, 过滤, 滤网, 面框, 扫尘, 壁挂, 清洁, 紧固, 盒, 格栅, 相对位置, 滚刷, 卡凸, 卡扣, 集尘, 水洗, 毛刷, cleaner, dust, fasten+, cleaning, fix+, filter+, indoor, conditioner, air, box

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 109185987 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 11 January 2019 (2019-01-11) description, paragraphs [0104]-[0107], and figures 1-3	1-20
Y	CN 105352043 A (WUHAN REFRIGERATION EQUIPMENT CO., LTD. OF MIDEA GROUP) 24 February 2016 (2016-02-24) description, paragraphs [0068]-[0184], and figures 4, 9, 10, 28, 29 and 34-41	1-20
E	CN 209672479 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 22 November 2019 (2019-11-22) description, paragraphs [0052]-[0138], and figures 1-14	1-20
PY	CN 208936323 U (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO., LTD. et al.) 04 June 2019 (2019-06-04) description, paragraphs [0055]-[0107], and figures 1-13	1-20
Y	CN 205425160 U (WUHAN REFRIGERATION EQUIPMENT CO., LTD. OF MIDEA GROUP) 03 August 2016 (2016-08-03) description, paragraphs [0063]-[0184], and figures 1-41	1-20

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"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
"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
"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

Date of the actual completion of the international search	Date of mailing of the international search report
10 January 2020	**23 January 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/112431

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 205279257 U (WUHAN REFRIGERATION EQUIPMENT CO., LTD. OF MIDEA GROUP) 01 June 2016 (2016-06-01) description, paragraphs [0063]-[0184], and figures 1-42	1-20
A	CN 204880362 U (JIANGSU CHUNLAN REFRIGERATING EQUIPMENT STOCK CO., LTD.) 16 December 2015 (2015-12-16) entire document	1-20
A	JP 2009204229 A (PANASONIC CORP.) 10 September 2009 (2009-09-10) entire document	1-20
A	EP 3196566 A1 (MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.) 26 July 2017 (2017-07-26) entire document	1-20

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/112431

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	109185987	A	11 January 2019	None			
CN	105352043	A	24 February 2016	CN	105352043	B	27 March 2018
CN	209672479	U	22 November 2019	None			
CN	208936323	U	04 June 2019	None			
CN	205425160	U	03 August 2016	None			
CN	205279257	U	01 June 2016	None			
CN	204880362	U	16 December 2015	None			
JP	2009204229	A	10 September 2009	JP	5189381	B2	24 April 2013
EP	3196566	A1	26 July 2017	JP	2017129309	A	27 July 2017
				AU	2017200364	B2	29 March 2018
				AU	2017200364	A1	03 August 2017

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201920179040 **[0001]**