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

(11) **EP 4 573 996 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.06.2025 Bulletin 2025/26

(21) Application number: **24209334.2**

(22) Date of filing: **29.10.2024**

(51) International Patent Classification (IPC):
A47L 1/02 *(2006.01)* ***A47L 11/282*** *(2006.01)*
A47L 11/40 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47L 1/02; A47L 11/282; A47L 11/4038; A47L 11/4069; A47L 2201/00

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **30.08.2024 CN 202411210074**

(71) Applicant: **Shenzhen Aidibao Technology Co., Ltd.**
Shenzhen, Guangdong Province (CN)

(72) Inventors:
- **DENG, Rui**
  Shenzhen (CN)
- **CHEN, Wenli**
  Shenzhen (CN)

(74) Representative: **Plavsa, Olga**
Plavsa & Plavsa
Patentna kancelarija
Strumicka 51
11050 Beograd (RS)

(54) **CLEANING MACHINE WITH STABILIZING AUXILIARY STRUCTURE**

(57) A cleaning machine with a stabilizing auxiliary structure is disclosed. A stabilizing auxiliary adsorption member is provided beside a vacuum adsorption member; an adsorption cavity communicating with an adsorption end of the vacuum adsorption member is provided in the stabilizing auxiliary adsorption member; a walking drive is provided at both sides of the vacuum adsorption member; a rotary motor is provided at both sides of the stabilizing auxiliary adsorption member; a rotary disk is movably mounted at a bottom end of a mounting housing and a transmission end of the rotary motor; and a dynamic wipers are arranged parallel to the rotary disc and are connected to the rotary disc by an elastic component. The invention improves the cleaning coverage, cleaning effect and cleaning efficiency by introducing the stabilizing auxiliary adsorption member, providing the elastic component between the rotary disk and the dynamic wiper, forming a stable multi-point elastic support.

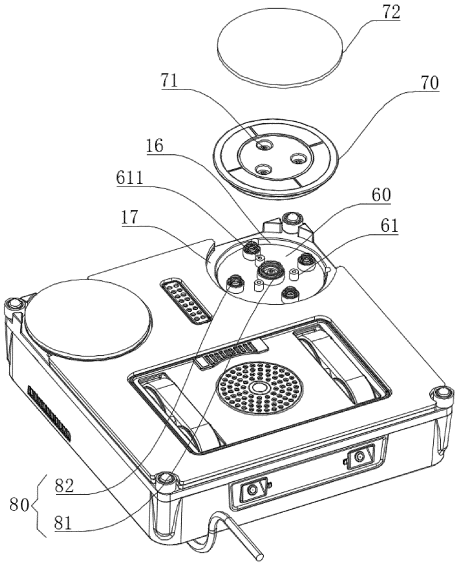

Fig. 5

EP 4 573 996 A1

Description

Technical Field

[0001] The present invention relates to the technical field of cleaning devices and in particular to a cleaning machine with a stabilizing auxiliary structure.

Background Art

[0002] With the continuous progress of science and technology and the increasing demand for quality of life, the traditional surface cleaning methods have met the basic cleaning needs in the past period of time. However, in the face of modern diversified and complicated cleaning scenarios, their limitations become increasingly prominent. Especially when dealing with cleaning surfaces with varying slopes, such as glass curtain walls with varying inclined surfaces, inverted slopes with planar edges, etc. it is difficult for conventional cleaning machines to achieve the desired cleaning effect due to lack of flexible adaptability and stable structure design.

[0003] In particular, wiping disc designs with a fixed or single adjustment mechanism used in conventional cleaning machines are particularly inadequate in the face of complex and varied cleaning environments. Since the fixed wiping disc cannot be automatically adjusted according to the change of surface inclination, the uneven distribution of cleaning force in the cleaning process may even cause the cleaning blind area due to the inability to adhere to the surface, which not only affects the cleaning efficiency, but also reduces the cleaning quality, which is difficult to meet the high requirements of intellectualization and convenience in modern cleaning operations.

Summary of the Invention

[0004] Accordingly, the present invention is directed to solve the above problems occurring in the prior art, and an object of the present invention is to provide a cleaning machine with a stabilizing auxiliary structure, which solves the technical problem that, when a conventional cleaning machine is faced with a cleaning surface having a change in inclination, it is difficult to effectively adapt to the change in the inclination of the surface, resulting in uneven cleaning force, causing cleaning blind areas due to the inability to adhere to the cleaning surface easily, and are affecting cleaning efficiency and cleaning quality, which is difficult to meet the urgent needs of modern cleaning operations for intelligent, efficient and high-quality cleaning.

[0005] In order to achieve the purpose, the invention adopts the following technical solution.

[0006] A cleaning machine with a stabilizing auxiliary structure of the present invention includes:

a mounting housing having a plurality of edge sensors mounted on an outer peripheral side of the mounting housing;

a vacuum adsorption member mounted on the mounting housing, wherein a stabilizing auxiliary adsorption member is provided beside the vacuum adsorption member; an adsorption cavity is provided in the stabilizing auxiliary adsorption member; and the adsorption cavity communicates with an adsorption end of the vacuum adsorption member;

a walking drive mounted on the mounting housing and provided at both sides of the vacuum adsorption member;

a rotating electric motor mounted on the mounting housing and provided at both sides of the stabilizing auxiliary adsorption member;

a rotary disk movably mounted at a bottom end of the mounting housing and connected to a transmission end of the rotary motor; and

a dynamic wiper arranged parallel to the rotary disk and connected to the rotary disk via an elastic component, wherein an elastic gap is formed between the dynamic wiper and the rotary disk.

[0007] As a preferred solution, the elastic member is provided between the rotary disk and the dynamic wiper; the elastic component includes a first elastic member and a second elastic member, wherein one end of the first elastic member is connected to the core of the rotary disk, and the other end thereof is connected to the core of the dynamic wiper; and the second elastic member is provided on the outer peripheral side of the first elastic member, one end thereof is connected to the rotary disk, and the other end thereof is connected to the dynamic wiper.

[0008] As a preferred solution, a plurality of limiting protrusions are further provided on a side of the rotary disk close to the dynamic wiper; and the limiting protrusions are provided between the first elastic member and the second elastic member and are equally spaced along the outer peripheral side of the first elastic member.

[0009] As a preferred solution, the second elastic members are spring members; and the second elastic members are plural and are equally spaced along the outer peripheral side of the rotary disk.

[0010] As a preferred solution, the second elastic member is an elastic sponge ring member; the second elastic member is sleeved on the outer peripheral side of the first elastic member and is spaced from the first elastic member; and one end of the second elastic member is in abutting connection with the rotary disk, and the other end thereof is in abutting connection with the dynamic wiper.

[0011] As a preferred solution, an adjustable fastener is further provided on the rotary disc; and a matching hole corresponding to the fastener is provided on the limiting protrusion.

[0012] As a preferred solution, the adsorption cavity includes a first adsorption chamber and a second adsorption chamber which are in communication with each

other; the second adsorption chamber is also in communication with an adsorption end of the vacuum adsorption member, and the mounting housing is provided with a first adsorption mesh, a second adsorption mesh and a third adsorption mesh respectively corresponding to the adsorption end of the vacuum adsorption member, the first adsorption chamber and the second adsorption chamber; the third adsorption mesh is provided between the first adsorption mesh and the second adsorption mesh, and is located in the middle of the mounting housing; the walking drives are provided on both sides of the first adsorption mesh; two of the walking drives are arranged in parallel; and the dynamic wipers are provided on both sides of the second adsorption mesh.

[0013] As a preferred solution, the adsorption cavity is flared; and the cavity volume of the first adsorption chamber is less than the cavity volume of the second adsorption chamber).

[0014] As a preferred solution, a first mounting groove is formed at a bottom end of the mounting housing; the rotary disk is movably mounted in the first mounting groove; a stepped ring groove is further provided on the outer peripheral side of the first mounting groove; the diameter of the stepped ring groove is greater than the diameter of the dynamic wiper; and the diameter of the dynamic wiper is greater than the diameter of the rotary disk.

[0015] As a preferred solution, it further includes:

a static wiper detachably mounted at a bottom end of the mounting housing; and
a cover body mounted on the mounting housing, wherein ventilation and heat dissipation grooves are formed on both opposite sides of the cover body; and a portable member is further provided on the cover body.

[0016] The present invention has obvious advantages and beneficial effects compared with the prior art. In particular, it can be seen from the above-mentioned technical solution that it is mainly to improve the walking stability of a cleaning machine by introducing a stabilizing auxiliary adsorption member, providing a guide pivot point, and at the same time providing an elastic component between a rotary disk and a dynamic wiper to form a multi-point elastic support structure, which not only provides a stable support for the rotary wiping, but also gives the cleaning machine the ability of the dynamic wiper to have an adaptive inclination angle when facing a cleaning surface with a change in inclination, and ensures that the dynamic wiper always maintains a close fit with the cleaning surface and balances the cleaning force. Thus, the cleaning coverage and the cleaning effect are significantly improved, and the cleaning efficiency is improved.

[0017] In order to more clearly illustrate the structural features and effects of the present invention, the present invention will be described in detail below with reference to the accompanying drawings and detailed description.

Brief Description of the Drawings

[0018]

Fig. 1 is a schematic view of a cleaning machine with a stabilizing auxiliary structure according to an embodiment of the present application;
Fig. 2 is a schematic view of a cleaning machine with a stabilizing auxiliary structure from another perspective of an embodiment of the present application;
Fig. 3 is a schematic view of an internal structure of a cleaning machine with a stabilizing auxiliary structure according to an embodiment of the present application;
Fig. 4 is a partially exploded schematic view of an internal structure of a cleaning machine with a stabilizing auxiliary structure according to an embodiment of the present application;
Fig. 5 is a partially exploded schematic view of a cleaning machine with a stabilizing auxiliary structure according to Embodiment 1 of the present application; and
Fig. 6 is a partially exploded schematic view of a cleaning machine with a stabilizing auxiliary structure according to Embodiment 2 of the present application.

Description of Reference Numerals:

[0019]

10, mounting housing; 11, edge sensor; 12, first adsorption mesh; 13, second adsorption mesh; 14, third adsorption mesh; 15, static wiper; 16, first mounting groove; 17, stepped ring groove;
20, vacuum adsorption member;
30, stabilizing auxiliary adsorption member; 31, adsorption cavity; 311, first adsorption chamber;
312, second adsorption chamber;
40, walking drive;
50, rotary motor;
60, rotary disk; 61, limiting protrusion; 611, mating hole;
70, dynamic wiper; 71, fastener; 72, rotary wiping surface layer
80, elastic component; 81, first elastic member; 82, second elastic member;
90, cover body; 91, ventilation and heat dissipation groove; 92, portable member.

Detailed Description of the Invention

[0020] In order that the objects, aspects and advantages of the present invention will become more apparent, a more particular description of the invention will be

rendered by reference to the appended drawings and the embodiments. It should be understood that the specific embodiments described herein are illustrative only and are not limiting the invention.

[0021] It will be understood that when an element is referred to as being "fixed" to another element, it can be directly on the other element or intervening elements may also be present. When an element is referred to as being "connected" to another element, it can be directly connected to the other element or intervening elements may also be present. The terms "vertical", "horizontal", "left", "right", and the like are used herein for illustrative purposes only.

[0022] With the rapid development of science and technology and the upgrading of people's pursuit of quality of life, the limitations of traditional surface cleaning methods are becoming more and more obvious in dealing with modern diversified and complicated cleaning challenges. Especially in the case of cleaning surfaces with different slope and inclination angles, such as glass curtain walls with inclination changes and chamfers with planar edges, the traditional cleaning machine is limited by its non-flexible self-adaptation and insufficient stability of the wiping disk design, which is difficult to effectively handle. For the commonly used fixed or limited adjustment of the wiping structure, it is difficult to meet the dynamic and flexible surface angle, resulting in uneven distribution of cleaning force and cleaning blind areas, which not only slows down the cleaning process, but also damages the cleaning effect. It is difficult to meet the urgent needs of modern cleaning industry for intelligent operation and high efficiency and convenience.

[0023] In order to solve the above problems, referring to Figs. 1 to 6, an embodiment of the present invention provides a cleaning machine with a stabilizing auxiliary structure, including:

a mounting housing 10 configured for providing a support platform for the overall structure, wherein a plurality of edge sensors 11 are mounted on the peripheral side of the mounting housing 10 for monitoring the boundary position in real time, preventing a collision and ensuring the safety of a cleaning operation;

a vacuum adsorption member 20, which is mounted on a mounting housing 10 and provides a vacuum adsorption capability, wherein a stabilizing auxiliary adsorption member 30 is provided beside the vacuum adsorption member 20 and is used for providing a plurality of stable supporting points for the movement of the cleaning machine and improving the stability of the movement and steering; an adsorption cavity 31 is provided in the stabilizing auxiliary adsorption member 30, and the adsorption cavity 31 communicates with the adsorption end of the vacuum adsorption member 20 so as to form a complete adsorption and ensure that the stabilizing auxiliary adsorption member 30 can normally produce a supporting point effect;

a walking drive 40, which is installed on the mounting housing 10 and disposed at both sides of the vacuum adsorption member 20, provides a smooth moving power for the cleaning machine and ensures a precise control of the cleaning path.

a rotary motor 50, which provides power support for the rotary wiping operation, is mounted on the mounting case 10 and disposed on both sides of the stabilizing auxiliary adsorption member 30.

a rotary disk 60, which is movably mounted at the bottom end of the mounting housing 10 and is connected to the transmission end of the rotary motor 50, and is driven by the rotary motor 50 to achieve rapid rotation, so as to lay the foundation for the rotary wiping operation; and

a dynamic wiper 70, which is arranged parallel to the rotary disc 60 and is connected to the rotary disc 60 via an elastic component 80 in a flexible connection manner, so as to ensure that the dynamic wiper 70 can both closely conform to a plane to be cleaned and can adapt to a continuous cleaning surface with different inclination angles during the cleaning process, wherein an elastic gap is formed between the dynamic wiper 70 and the rotary disc 60, which can both effectively buffer the impact force during the cleaning process and ensure that the dynamic wiper 70 has a sufficient space for adaptive adjustment.

[0024] Note that, referring to Fig. 3, the stabilizing auxiliary adsorption member 30 is disposed between the two rotary motors 50, i.e., a adsorption fulcrum is constructed between the two dynamic wipers 70, so as to balance the torque deviation between the two dynamic wipers 70 and serve as a guide fulcrum, ensuring the stability of the cleaning machine during steering or cleaning, and avoiding the occurrence of slippage.

[0025] Specifically, referring to Figs. 5 and 6, an elastic component 80 is provided between the rotary disk 60 and the dynamic wiper 70 to ensure a close fit of the rotary disk 60 and the dynamic wiper 70 while giving the cleaning machine a higher flexibility. The elastic component 80 includes a first elastic member 81 and a second elastic member 82, which cooperate with each other to achieve multi-dimensional cushioning and inclination angle adaptation of the cleaning machine. One end of the first elastic member 81 is connected to the core of the rotary disk 60, and the other end thereof is connected to the core of the dynamic wiper 70, so as to provide a stable and elastic support for the core region. The second elastic member 82 is arranged on the outer peripheral side of the first elastic member 81, further enhancing the stability and adaptability of the structure. One end of the second elastic member 82 is connected to the rotary disk 60, and the other end thereof is connected to the dynamic wiper 70. This arrangement effectively disperses impact forces during cleaning, reduces vibration and wear, and improves overall cleaning efficiency and durability.

[0026] A plurality of limiting protrusions 61 are further provided on one side of the rotary disk 60 close to the dynamic wiper 70. The limiting protrusions 61 are arranged between the first elastic member 81 and the second elastic member 82 and are distributed at equal intervals along the outer peripheral side of the first elastic member 81. The rotary disc 60 is further provided with an adjustable fastener 71. The limiting protrusion 61 is provided with a matching hole 611 corresponding to the fastener 71.

[0027] The design of the adjustable fastener 71 provides the user with a variety of flexible selection requirements. According to the cleaning requirements and the characteristics of the cleaning surface, the user may adjust the connection relationship between the rotary disc 60 and the dynamic wiper 70 by means of the adjustable fastener 71, so as to realize the switching between the fixed connection and the elastic connection. For example, in the case of facing a flat cleaning surface with no change in the inclination angle, the impact of the elastic component 80 on the cleaning is not considered due to not being affected by the inclination angle covering surface. In order to improve the cleaning efficiency and extend the service life of the elastic component 80, the user may select the fixed connection relationship at this time.

[0028] With reference to Fig. 4, the adsorption cavity 31 includes a first adsorption chamber 311 and a second adsorption chamber 312 which are in communication with each other, wherein the second adsorption chamber 312 is also in communication with the adsorption end of the vacuum adsorption member 20 so as to form a complete airflow flow path, providing multiple auxiliary fulcrums, enhancing the adsorption stability, improving the anti-interference ability and adaptability. The mounting housing 10 is provided with a first adsorption mesh 12, a second adsorption mesh 13 and a third adsorption mesh 14 which correspond to the adsorption end of the vacuum adsorption member 20, the first adsorption chamber 311 and the second adsorption chamber 312 respectively. The designs of these meshes ensure a smooth passage of the airflow and a stable adsorption effect. The third adsorption mesh 14 is provided between the first adsorption mesh 12 and the second adsorption mesh 13, and is located in the middle part of the mounting housing 10, so as to effectively enhance the adsorption uniformity and strength. The walking drives 40 are arranged on both sides of the first adsorption mesh 12, and two walking drives 40 are arranged in parallel, which not only ensures the smooth movement of the cleaning machine, but also improves the accuracy and efficiency of walking. The dynamic wipers 70 are provided on both sides of the second adsorption mesh 13, and cooperate with the rotary disc 60 to achieve efficient wiping and decontamination of the cleaning surface. The two dynamic wipers 70 rotate in opposite directions.

[0029] In the preferred embodiment, the two dynamic wipers 70 are rotated towards one side close to each other to ensure wiping stability while further improving the overall cleaning effect.

[0030] Referring to Fig. 5 or Fig. 6, the dynamic wiper 70 is further detachably mounted with a rotary wiping surface layer 72 for later maintenance replacement and use, which ensures the rotary wiping effect, improves the cleaning depth and ensures the cleaning quality.

[0031] The adsorption chamber 31 is flared, which not only improves the flow efficiency of the airflow, but also enhances the adsorption effect. Specifically, the first adsorption chamber 311 serves as a preliminary airflow inflow region. The cavity volume of the first adsorption chamber 311 is less than the cavity volume of the second adsorption chamber 312. This difference in volume enables the airflow to accelerate when passing through the first adsorption chamber 311, forming a preliminary air pressure difference and enhancing the adsorption force. When the airflow enters the second adsorption chamber 312, the airflow speed is slowed down due to the increase of the cavity volume, but the air pressure difference is still maintained, guiding the airflow to be uniformly distributed, ensuring the stability of the adsorption process.

[0032] Furthermore, a first mounting groove 16 is provided at the bottom end of the mounting housing 10, so as to provide a stable and flexible mounting platform for the rotary disk 60, ensure the stability of the operation process of the rotary disk 60, and also facilitate subsequent maintenance and replacement. The rotary disk 60 is movably mounted in the first mounting groove 16. A stepped ring groove 17 is further provided on the outer peripheral side of the first mounting groove 16. The diameter of the stepped ring groove 17 is greater than the diameter of the dynamic wiper 70. This layout reserves sufficient movement space for the dynamic wiper 70 to ensure that the dynamic wiper 70 can freely swing under the drive of the rotary disk 60 so as to adapt to the cleaning requirements of different inclined surfaces. At the same time, the diameter of the dynamic wiper 70 is greater than the diameter of the rotary disk 60, which is sized to cover a larger area when the dynamic wiper 70 contacts the cleaning surface, improving cleaning efficiency and effectiveness.

[0033] In addition, referring to Figs. 1, 2 and 4, the cleaning machine with the stabilizing auxiliary structure further includes:

a static wiper 15, which is detachably mounted at the bottom end of the mounting housing 10 and cooperates with the dynamic wiper 70 to form a double wiping operation, further improving the cleaning efficiency and quality, wherein the detachable design facilitates flexible configuration and replacement according to specific cleaning requirements, so as to extend the service life of the equipment; and

a cover body 90, which, as a protective layer for the mounting housing 10, is mounted on the mounting housing 10, wherein the ventilation and heat dissipation grooves 91 are provided on two opposite

sides of the cover body 90, which effectively ensures the heat dissipation performance of the cleaning machine during a long-time operation, and prevents the internal components from being damaged due to overheating; and a portable member 92 is further provided on the cover body 90, which not only facilitates the user to carry and move the cleaning machine, but also improves the overall portability and use comfort.

[0034] In Embodiment 1, referring to Fig. 5, the second elastic members 82 are spring members, and the second elastic members 82 are multiple and distributed at equal intervals along the outer peripheral side of the rotary disk 60, which not only ensures that the dynamic wipers 70 are evenly supported and cushioned in all directions, but also makes the overall structure more compact and stable. Each spring member can work independently, and can be adjusted adaptively according to the magnitude and direction of the received force, so as to achieve a more refined dynamic balance control and improve the cleaning efficiency and service life of the cleaning machine.

[0035] In Embodiment 2, referring to Fig. 6, the second elastic member 82 is an elastic sponge ring member, which utilizes the excellent flexibility and elasticity of the sponge material and achieves an all-directional cushioning and sealing effect by a ring-shaped structure. The second elastic member 82 is sleeved on the outer peripheral side of the first elastic member 81 and is spaced apart from the first elastic member 81. This design not only ensures the relative independence between the two members, but also allows the slight deformation generated when they cooperate with each other, thereby improving the overall adaptability and durability.

[0036] Further, one end of the second elastic member 82 is in abutting connection with the rotary plate 60, and the other end thereof is in abutting connection with the dynamic wiper 70. This interference connection effectively transmits the power of the rotary plate 60, while minimizing friction and wear, and ensuring smooth operation and efficient cleaning during cleaning.

[0037] The above mentioned are only preferred examples of the invention and is not intended to limit the invention. Any modifications, equivalents, and improvements within the principles of the invention are intended to be included within the scope of this invention.

Claims

1. A cleaning machine with a stabilizing auxiliary structure, **characterized by** comprising:

   a mounting housing (10) having a plurality of edge sensors (11) mounted on an outer peripheral side of the mounting housing (10);
   a vacuum adsorption member (20) mounted on the mounting housing (10), wherein a stabilizing auxiliary adsorption member (30) is provided beside the vacuum adsorption member (20); an adsorption cavity (31) is provided in the stabilizing auxiliary adsorption member (30); and the adsorption cavity (31) communicates with an adsorption end of the vacuum adsorption member (20);
   a walking drive (40) mounted on the mounting housing (10) and provided at both sides of the vacuum adsorption member (20);
   a rotating electric motor (50) mounted on the mounting housing (10) and provided at both sides of the stabilizing auxiliary adsorption member(30);
   a rotary disk (60) movably mounted at a bottom end of the mounting housing (10) and connected to a transmission end of the rotary motor (50); and
   a dynamic wiper (70) arranged parallel to the rotary disk (60) and connected to the rotary disk (60) via an elastic component (80), wherein an elastic gap is formed between the dynamic wiper (70) and the rotary disk (60).

2. The cleaning machine with the stabilizing auxiliary structure according to claim 1, **characterized in that** the elastic member (80) is provided between the rotary disk (60) and the dynamic wiper (70); the elastic component (80) comprises a first elastic member (81) and a second elastic member (82), wherein one end of the first elastic member (81) is connected to the core of the rotary disk (60), and the other end thereof is connected to the core of the dynamic wiper (70); and the second elastic member (82) is provided on the outer peripheral side of the first elastic member (81), one end thereof is connected to the rotary disk (60), and the other end thereof is connected to the dynamic wiper (70).

3. The cleaning machine with the stabilizing auxiliary structure according to claim 2, **characterized in that** a plurality of limiting protrusions (61) are further provided on a side of the rotary disk (60) close to the dynamic wiper (70); and the limiting protrusions (61) are provided between the first elastic member (81) and the second elastic member (82) and are equally spaced along the outer peripheral side of the first elastic member (81).

4. The cleaning machine with the stabilizing auxiliary structure according to claims 2 or 3, **characterized in that** the second elastic members (82) are spring members; and the second elastic members (82) are plural and are equally spaced along the outer peripheral side of the rotary disk (60).

5. The cleaning machine with the stabilizing auxiliary structure according to claims 2 or 3, **characterized**

in that the second elastic member (82) is an elastic sponge ring member; the second elastic member (82) is sleeved on the outer peripheral side of the first elastic member (81) and is spaced from the first elastic member (81); and one end of the second elastic member (82) is in abutting connection with the rotary disk (60), and the other end thereof is in abutting connection with the dynamic wiper (70).

6. The cleaning machine with the stabilizing auxiliary structure according to claim 3, **characterized in that** an adjustable fastener (71) is further provided on the rotary disc (60); and a matching hole (611) corresponding to the fastener (71) is provided on the limiting protrusion (61).

7. The cleaning machine with the stabilizing auxiliary structure according to claim 1, **characterized in that** the adsorption cavity (31) comprises a first adsorption chamber (311) and a second adsorption chamber (312) which are in communication with each other; the second adsorption chamber (312) is also in communication with an adsorption end of the vacuum adsorption member (20), and the mounting housing (10) is provided with a first adsorption mesh (12), a second adsorption mesh (13) and a third adsorption mesh (14) respectively corresponding to the adsorption end of the vacuum adsorption member (20), the first adsorption chamber (311) and the second adsorption chamber (312); the third adsorption mesh (14) is provided between the first adsorption mesh (12) and the second adsorption mesh (13), and is located in the middle of the mounting housing (10); the walking drives (40) are provided on both sides of the first adsorption mesh (12); two of the walking drives (40) are arranged in parallel; and the dynamic wipers (70) are provided on both sides of the second adsorption mesh (13).

8. The cleaning machine with the stabilizing auxiliary structure according to claim 7, **characterized in that** the adsorption cavity (31) is flared; and the cavity volume of the first adsorption chamber (311) is less than the cavity volume of the second adsorption chamber (312).

9. The cleaning machine with the stabilizing auxiliary structure according to claim 1, **characterized in that** a first mounting groove (16) is formed at a bottom end of the mounting housing (10); the rotary disk (60) is movably mounted in the first mounting groove (16); a stepped ring groove (17) is further provided on the outer peripheral side of the first mounting groove (16); the diameter of the stepped ring groove (17) is greater than the diameter of the dynamic wiper (70); and the diameter of the dynamic wiper (70) is greater than the diameter of the rotary disk (60).

10. The cleaning machine with the stabilizing auxiliary structure according to claim 1, **characterized by** further comprising:

a static wiper (15) detachably mounted at a bottom end of the mounting housing (10); and a cover body (90) mounted on the mounting housing (10), wherein ventilation and heat dissipation grooves (91) are formed on both opposite sides of the cover body (90); and a portable member (92) is further provided on the cover body (90).

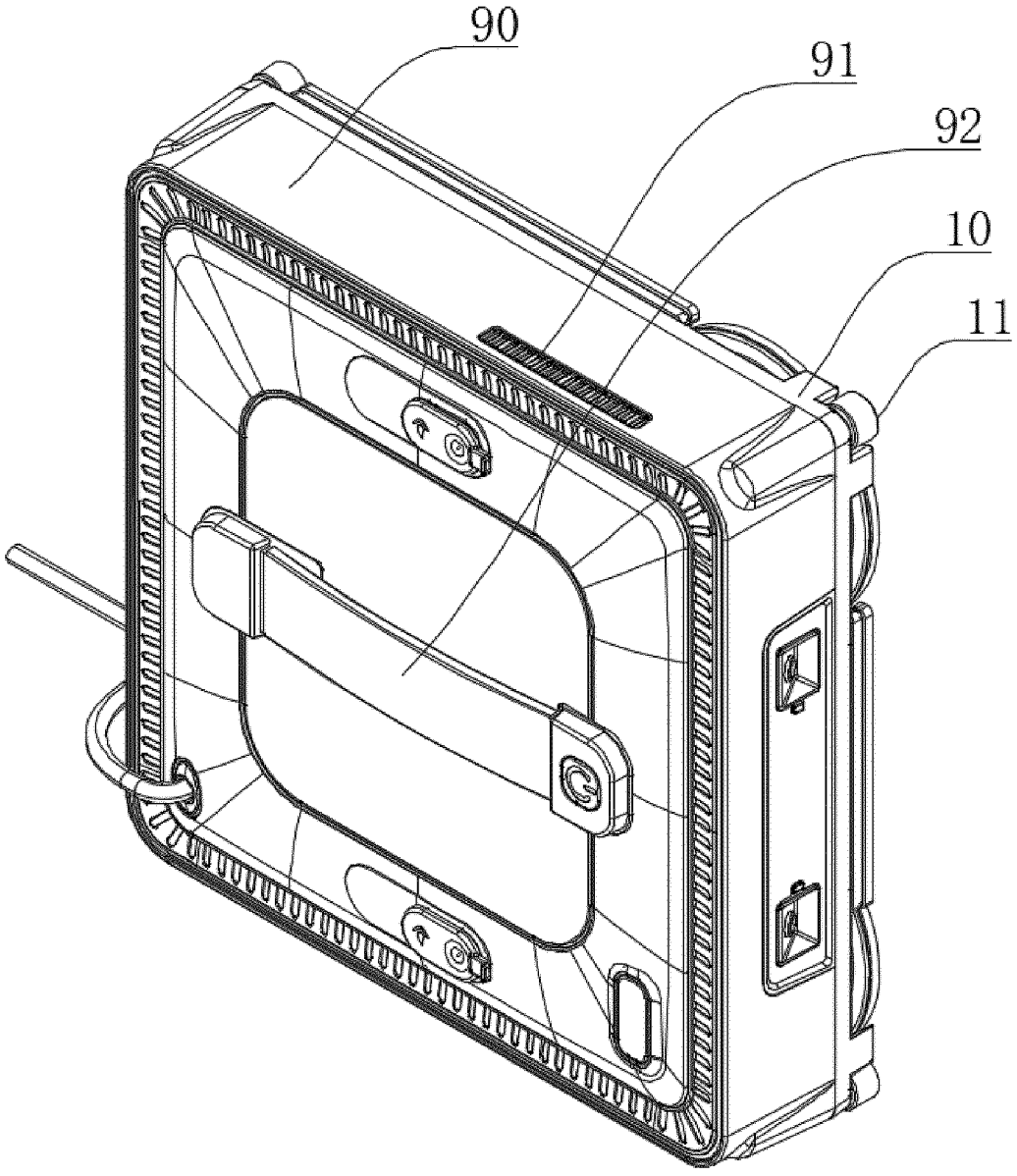

Fig. 1

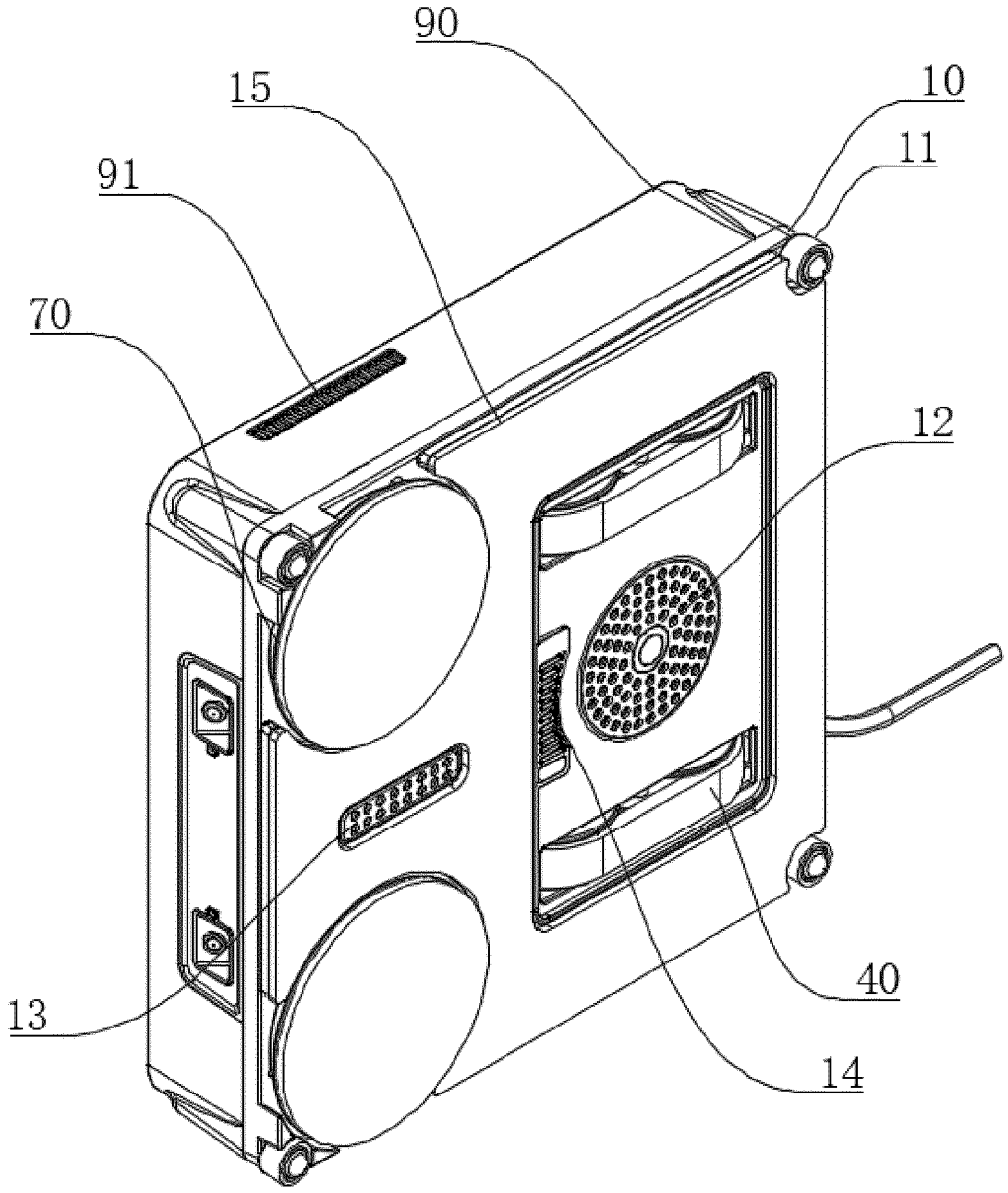

Fig. 2

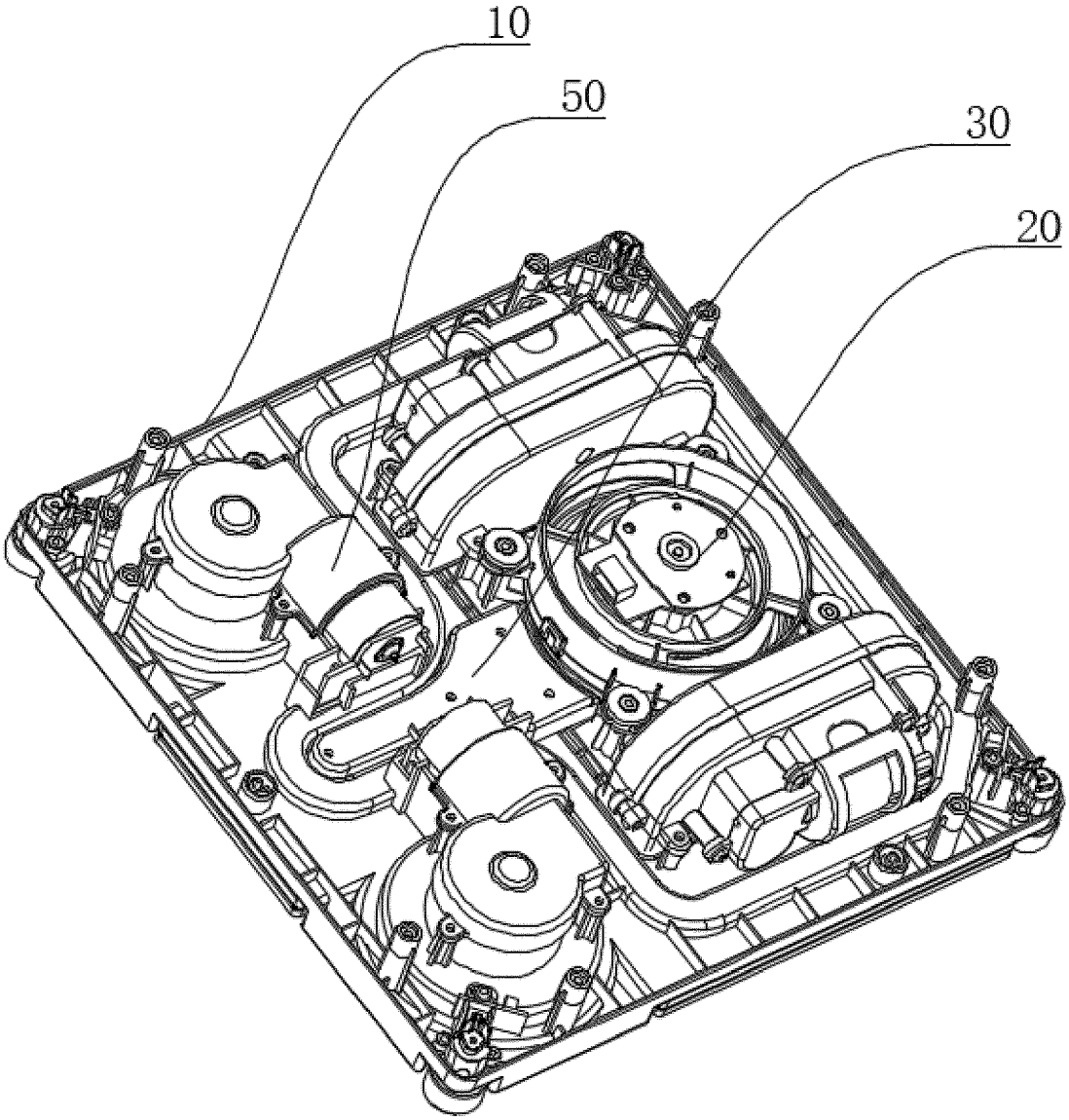

Fig. 3

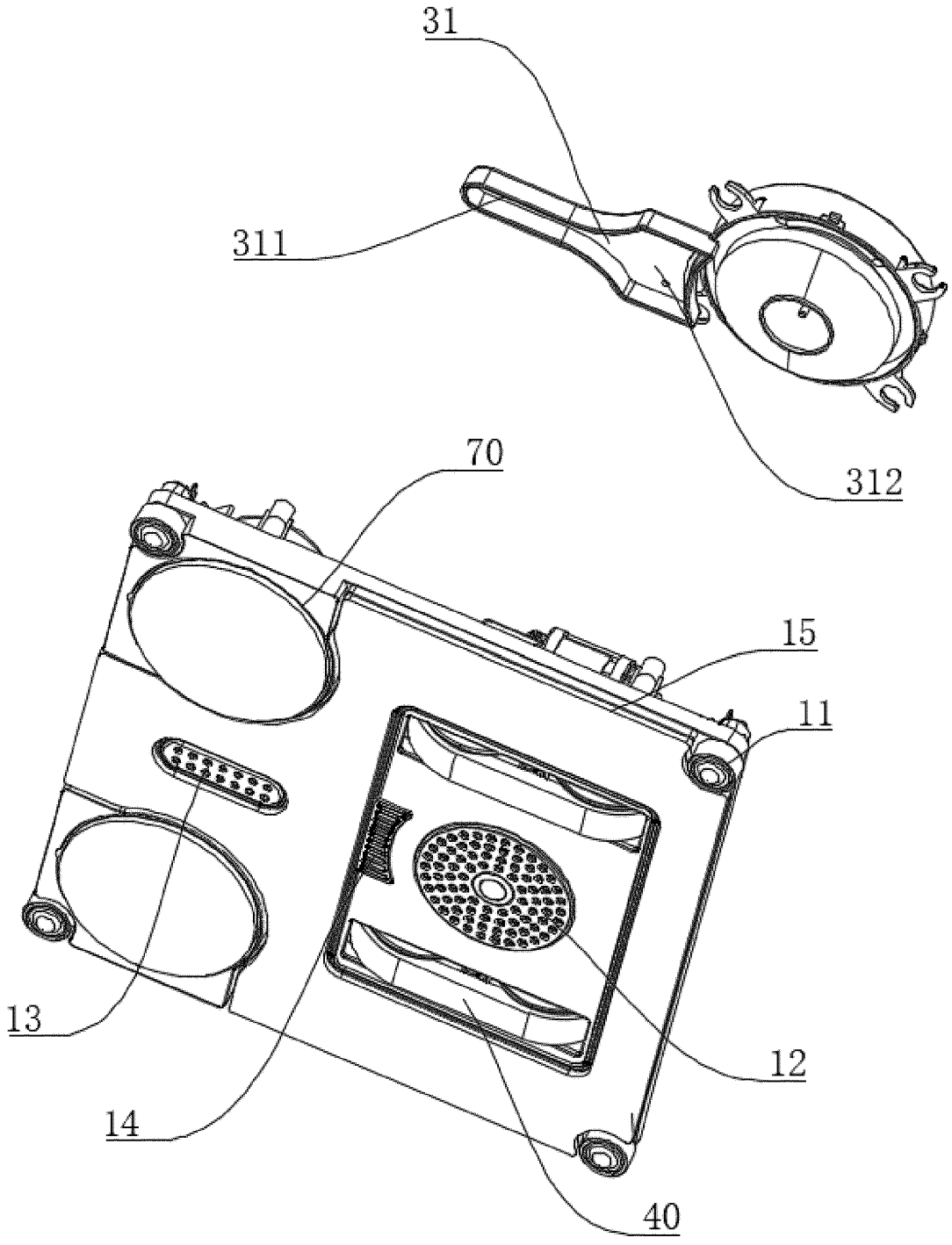

Fig. 4

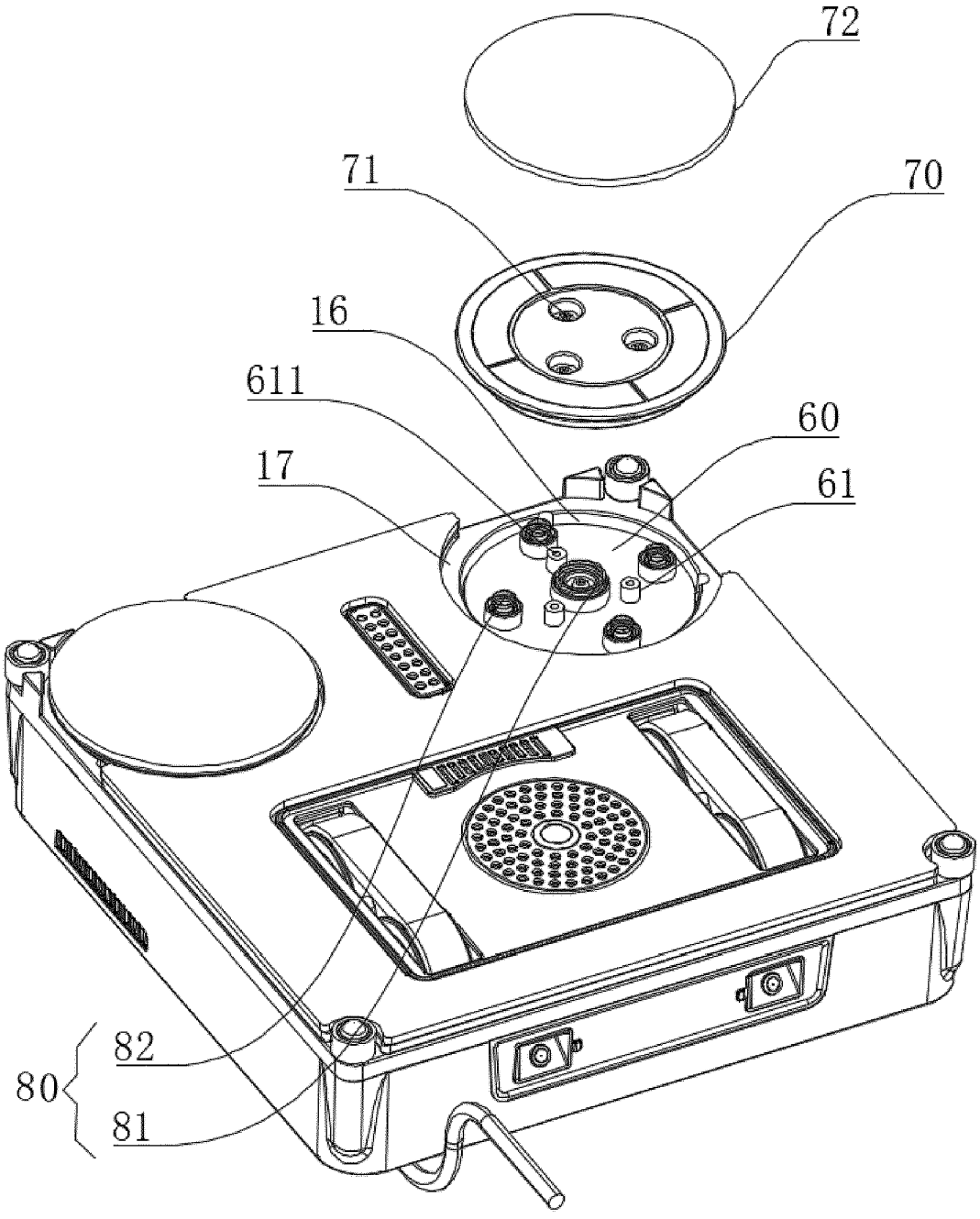

Fig. 5

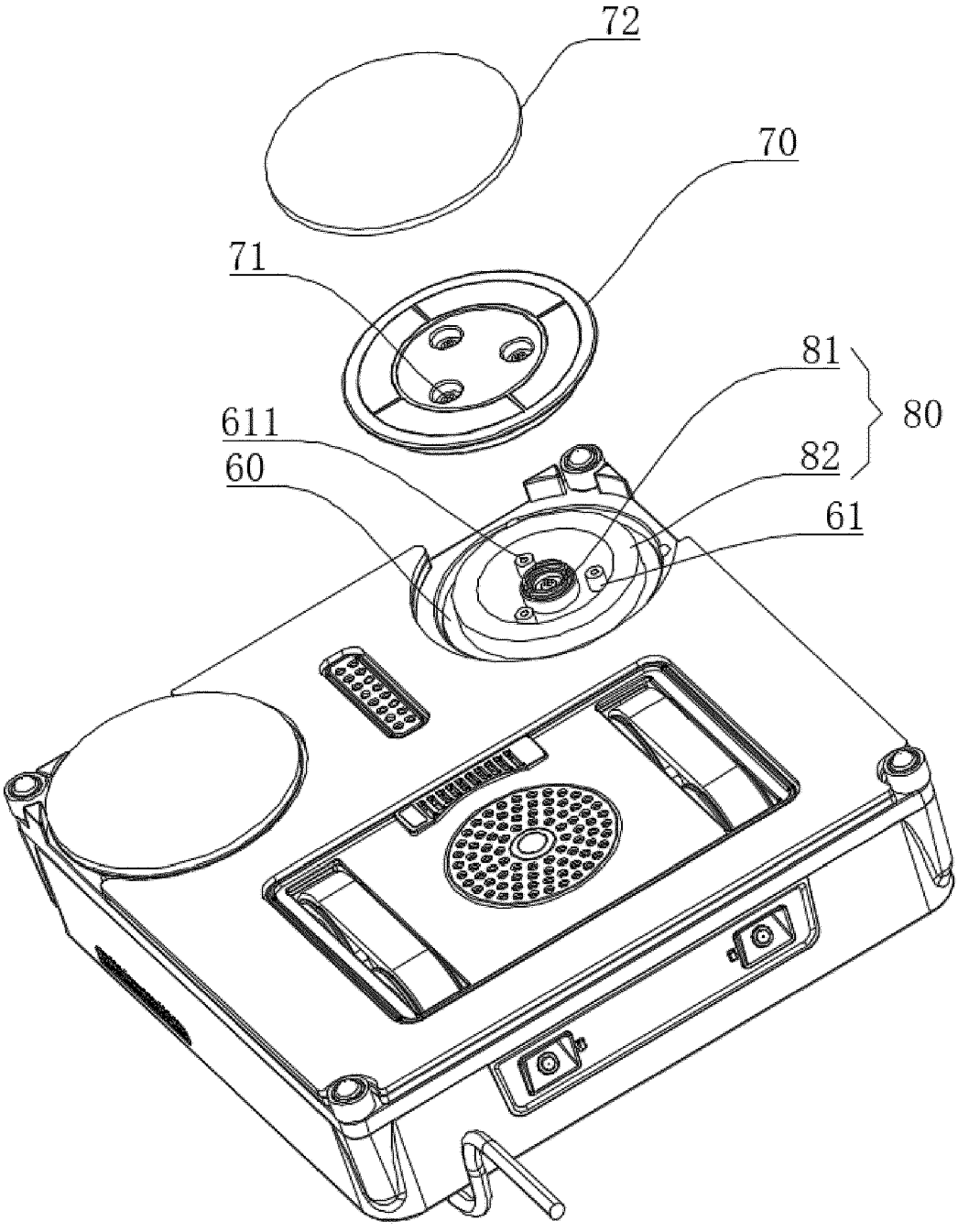

Fig. 6

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 20 9334

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	US 2006/143845 A1 (MIYAKE TOHRU [JP] ET AL) 6 July 2006 (2006-07-06) * paragraphs [0031] - [0065] * * figures 1-8 *	1,9,10 2-8	INV. A47L1/02 A47L11/282 A47L11/40
Y	CN 109 316 136 A (NARWEL INTELLIGENT TECH DONGGUAN CO LTD) 12 February 2019 (2019-02-12) * paragraphs [0114] - [0134] * * paragraphs [0179] - [0184] * * figures 1-37 *	1,9,10	
Y	US 2021/290010 A1 (NIU LIQUN [CN]) 23 September 2021 (2021-09-23) * paragraphs [0037] - [0052] * * figures 1-20 *	1,9,10	

TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 April 2025	Weinberg, Ekkehard

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 20 9334

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-04-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006143845 A1	06-07-2006	AT E442802 T1	15-10-2009
		AU 2002332281 A1	19-04-2004
		CN 1688235 A	26-10-2005
		EP 1559358 A1	03-08-2005
		JP 3892462 B2	14-03-2007
		JP WO2004028324 A1	19-01-2006
		US 2006143845 A1	06-07-2006
		WO 2004028324 A1	08-04-2004
CN 109316136 A	12-02-2019	CN 106725135 A	31-05-2017
		CN 109316135 A	12-02-2019
		CN 109316136 A	12-02-2019
US 2021290010 A1	23-09-2021	EP 3797663 A1	31-03-2021
		JP 7079031 B2	01-06-2022
		JP 2021516111 A	01-07-2021
		KR 20200102473 A	31-08-2020
		US 2021290010 A1	23-09-2021
		WO 2019184616 A1	03-10-2019

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82