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

(11) **EP 4 487 713 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.01.2025 Bulletin 2025/02

(21) Application number: **24183928.1**

(22) Date of filing: **24.06.2024**

(51) International Patent Classification (IPC):
A24F 40/40 *(2020.01)* *A24F 40/10* *(2020.01)*

(52) Cooperative Patent Classification (CPC):
A24F 40/40; A24F 40/10

(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: **28.06.2023 CN 202310777096**

(71) Applicant: **Shenzhen Woody Vapes Technology Co., Ltd.**
Shenzhen, Guangdong 518000 (CN)

(72) Inventors:
- **HUANG, Zhiwei**
  Shenzhen, 518000 (CN)
- **CHEN, Lijun**
  Shenzhen, 518000 (CN)
- **NIU, Yanming**
  Shenzhen, 518000 (CN)

(74) Representative: **Hamer, Christopher K. et al**
Mathys & Squire
The Shard
32 London Bridge Street
London SE1 9SG (GB)

(54) ELECTRONIC ATOMIZATION DEVICE

(57) An electronic atomization device is provided. The electronic atomization device includes a housing, at least two atomization assemblies, and a rotation assembly. The housing defines a rotation mounting cavity. The at least two atomization assemblies are configured to atomize an aerosol substrate to output aerosol. The at least two atomization assemblies are mounted to the housing and spaced apart from one another. Each of the at least two atomization assemblies is provided with a first electrode connector, and the first electrode connector is disposed close to the rotation mounting cavity. The rotation assembly includes a power supply device and a second electrode connector electrically connected to the power supply device. The rotation assembly is mounted in the rotation mounting cavity and rotatable around a center of the rotation mounting cavity. The second electrode connector is electrically connected to or disconnected from the first electrode connector along with rotation of the rotation assembly. In the electronic atomization device, a sensor can be prevented from automatically activating, thereby addressing the technical problem of adverse effects on e-cigarette rod quality caused by the automatic activation of the sensor.

EP 4 487 713 A1

Description

TECHNICAL FIELD

[0001] The disclosure relates to the technical field of e-cigarettes, and in particular, to an electronic atomization device.

BACKGROUND

[0002] For traditional dual-nozzle e-cigarette rods, most are provided with two sensor structures that are separated from each other. During production, an upper sensor assembly is assembled first, and then a lower sensor assembly is assembled, resulting in low production efficiency. Moreover, it needs multiple wires to separately connect a battery to the upper sensor assembly and the lower sensor assembly, resulting in a long soldering time, low efficiency, and issues such as false soldering and desoldering. Additionally, traditional e-cigarette rods are prone to being affected by high altitude, high pressure, high temperature, and low temperature during long-distance transportation, which may cause automatic activation of a sensor that can result in continuous atomization of the e-cigarette rod within a packaging, leading to problems such as damage to a heating element, degraded taste, and e-liquid leakage.

SUMMARY

[0003] The disclosure aims to provide an electronic atomization device, which can prevent a sensor from automatically activating, thereby addressing the technical problem of adverse effects on e-cigarette rod quality caused by the automatic activation of the sensor.

[0004] In order to solve the above technical problem, the disclosure adopts the following technical solutions.

[0005] An electronic atomization device includes a housing, at least two atomization assemblies, and a rotation assembly. The housing defines a rotation mounting cavity. The at least two atomization assemblies are configured to atomize an aerosol substrate to output aerosol. The at least two atomization assemblies are mounted to the housing and spaced apart from one another. Each of the at least two atomization assemblies is provided with a first electrode connector. The first electrode connector is disposed close to the rotation mounting cavity. The rotation assembly includes a power supply device and a second electrode connector electrically connected to the power supply device. The rotation assembly is mounted in the rotation mounting cavity and rotatable around a center of the rotation mounting cavity. The second electrode connector is electrically connected to or disconnected from the first electrode connector along with rotation of the rotation assembly.

[0006] Preferably, the rotation assembly includes a rotation housing. The power supply device is mounted in the rotation housing. The second electrode connector is mounted to a side face of the rotation housing. The rotation housing is mounted in the rotation mounting cavity and rotatable around the center of the rotation mounting cavity.

[0007] Preferably, the housing has connection position identifiers corresponding to the at least two atomization assemblies and a disconnection position identifier. The rotation assembly has a rotation indication arrow. When the rotation indication arrow is aligned with one of the connection position identifiers, the second electrode connector is electrically connected to the first electrode connector of a corresponding one of the at least two atomization assemblies. When the rotation indication arrow is aligned with the disconnection position identifier, the second electrode connector is disconnected from the first electrode connector of each of the at least two atomization assemblies.

[0008] Preferably, the second electrode connector and/or the first electrode connector is a spring-loaded pin.

[0009] Preferably, the rotation assembly includes a rotation housing, a rotation bottom cover covering and connected to the rotation housing, and a rotation-housing silicone sleeve. The second electrode connector is fixedly mounted to a side face of the rotation housing. The rotation-housing silicone sleeve is sleeved on the rotation housing. The rotation housing has a holding portion on a top of the rotation housing.

[0010] Preferably, the power supply device includes a battery, a mainboard, and a mainboard silicone sleeve. The battery is mounted in an internal cavity of the rotation housing. The mainboard is fixedly mounted in an internal cavity of the rotation bottom cover. The mainboard silicone sleeve is sleeved on the mainboard and is sealingly connected to the rotation bottom cover. The mainboard is electrically connected to both the battery and the second electrode connector.

[0011] Preferably, the mainboard is connected to the rotation bottom cover via screws.

[0012] Preferably, the electronic atomization device further includes a cover plate. The cover plate defines a clearance hole through which the holding portion extends. the cover plate covers the rotation mounting cavity to limit the rotation assembly in the rotation mounting cavity.

[0013] Preferably, the cover plate has connection position identifiers corresponding to the at least two atomization assemblies and a disconnection position identifier. The holding portion has a rotation indication arrow. When the rotation indication arrow is aligned with one of the connection position identifiers, the second electrode connector is electrically connected to the first electrode connector of a corresponding one of the at least two atomization assemblies. When the rotation indication arrow is aligned with the disconnection position identifier, the second electrode connector is disconnected from the first electrode connector of each of the at least two atomization assemblies.

[0014] Preferably, the housing defines atomization

mounting cavities for mounting the at least two atomization assemblies and windows, where the windows are in communication with the atomization mounting cavities and the rotation mounting cavity.

[0015] The beneficial technical effects of the disclosure are as follows. The electronic atomization device includes the rotation assembly and the at least two atomization assemblies. By rotating the rotation assembly, the second electrode connector of the rotation assembly can be in electrical contact with the first electrode connector of one of the at least two atomization assemblies to achieve electrical connection, thereby switching the power supply to different atomization assemblies. By rotating the rotation assembly, the power supply to all the atomization assemblies can be simultaneously cut off, the automatic activation of the sensor can be prevented, thereby thoroughly resolving the technical problem of adverse effects on e-cigarette rod quality caused by the automatic activation of the sensor during transportation and in a static state.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a schematic structural view of an electronic atomization device of an embodiment of the disclosure.

FIG. 2 is an exploded schematic structural view of an electronic atomization device of an embodiment of the disclosure.

FIG. 3 is a schematic structural view of a rotation assembly of an embodiment of the disclosure.

FIG. 4 is a schematic view illustrating a position relationship between a rotation assembly and two atomization assemblies when a rotation indication arrow of the rotation assembly is aligned with a first connection position identifier.

FIG. 5 is a schematic view illustrating a position relationship between a rotation assembly and two atomization assemblies when a rotation indication arrow of the rotation assembly is aligned with a second connection position identifier.

FIG. 6 is a schematic view illustrating a position relationship between a rotation assembly and the two atomization assemblies when a rotation indication arrow of the rotation assembly is aligned with the disconnection position identifier.

DETAILED DESCRIPTION

[0017] In order to make those skilled in the art understand the objects, technical solutions, and advantages of the disclosure more clearly, the disclosure is further described hereinafter with reference to the accompanying drawings and embodiments.

[0018] An electronic atomization device provided in the disclosure includes a housing, at least two atomization assemblies, and a rotation assembly. The housing defines a rotation mounting cavity. The at least two atomization assembly are configured to atomize an aerosol substrate to output aerosol. The at least two atomization assemblies are mounted to the housing and spaced apart from one another. Each of the at least two atomization assemblies is provided with a first electrode connector. The first electrode connector is disposed close to the rotation mounting cavity. The rotation assembly includes a power supply device and a second electrode connector electrically connected to the power supply device. The rotation assembly is mounted in the rotation mounting cavity and rotatable around a center of the rotation mounting cavity. The second electrode connector is electrically connected to or disconnected from the first electrode connector along with rotation of the rotation assembly.

[0019] The electronic atomization device of the disclosure includes at least two atomization assemblies. That is, the number of the atomization assemblies may be two, and may also be three, four, or other numbers. The electronic atomization device of the disclosure will be further described below by taking the electronic atomization device having two atomization assemblies as an example.

[0020] As illustrated in FIGS. 1-6, in some embodiments of the disclosure, the electronic atomization device includes an atomization assembly 10, an atomization assembly 20, a rotation assembly 30, and a housing 40. The atomization assembly 10 is provided with a first nozzle 11 and a first electrode connector 12. The atomization assembly 10 defines a first e-liquid storage cavity and a first atomization cavity therein. A first atomization core is provided in the first atomization cavity, and the first nozzle 11 is in communication with the first atomization cavity. The atomization assembly 20 is provided with a second nozzle 21 and a first electrode connector 22. The atomization assembly 20 defines a second e-liquid storage cavity and a second atomization cavity therein. A second atomization core is provided in the second atomization cavity, and the second nozzle 21 is in communication with the second atomization cavity. A power supply device is mounted in the rotation assembly. A second electrode connector 35 is attached to a side face of the rotation assembly 30 and electrically connected to the power supply device. Two ends of the housing 40 are respectively define a first atomization mounting cavity (not illustrated) and a second atomization mounting cavity 42. The housing 40 defines a rotation mounting cavity 43 at the middle of the housing 40. The housing 40 further defines a first window 44 extending through the first atomization mounting cavity and the rotation mounting cavity 43, and a second window (not illustrated) extending through the second atomization mounting cavity 42 and the rotation mounting cavity 43. The rotation assembly 30 is mounted in the rotation mounting cavity 43 and rotatable around the center of the rotation mounting cavity 43. The atomization assembly 10 is mounted in

the first atomization mounting cavity, and the atomization assembly 20 is mounted in the second atomization mounting cavity 42. In one embodiment, a center of one of the atomization mounting cavities (i.e., the first atomization mounting cavity), a center of another one of the atomization mounting cavities (i.e., the second atomization mounting cavity 42), and a center of one of the windows (i.e., the first window 44), and a center of another one of the windows (i.e., the second window) are collinear with each other.

[0021] In a preferred embodiment, paired spring-loaded pins are used for the second electrode connector 35, the first electrode connector 12, and the first electrode connector 22. The spring-loaded pins are used to achieve the contact between the rotation assembly 30 and the atomization assembly 10 and the contact between the rotation assembly 30 and the atomization assembly 20, thereby achieving the electrical connection between the atomization assembly 20 and the power supply device. Compared with the related art in which a battery is soldered to two atomization assemblies through multiple wires, in the disclosure, the assembly soldering is simple, the production efficiency is high, and at the same time, defects such as missing soldering, false soldering, and desoldering are reduced, thereby reducing the production costs. It should be understood that, in other embodiments, the second electrode connector 35 is a spring-loaded pin, and the first electrode connector 12 and the first electrode connector 22 are resilient sheet structures. Alternatively, the second electrode connector 35 is a resilient sheet structure, and the first electrode connector 12 and the first electrode connector 22 are spring-loaded pins.

[0022] In a preferred embodiment, the rotation assembly 30 includes a rotation housing 31. The power supply device is mounted in the rotation housing 31. The second electrode connector 35 is mounted to a side face of the rotation housing 31. The rotation housing 31 is mounted in the rotation mounting cavity 43 and rotatable around the center of the rotation mounting cavity 43.

[0023] In a preferred embodiment, the rotation assembly 30 includes a rotation housing 31, a rotation bottom cover 32 covering and connected to the rotation housing 31, and a rotation-housing silicone sleeve 36. The second electrode connector 35 is fixedly mounted on the side face of the rotation housing 31, and the rotation-housing silicone sleeve 36 is sleeved on the rotation housing 31. The power supply device includes a battery 34, a mainboard 33, and a mainboard silicone sleeve 37. The battery 34 is fixed mounted in an internal cavity of the rotation housing 31 via screws. The mainboard 33 is fixedly mounted in an internal cavity of the rotation bottom cover 32. The mainboard silicone sleeve 37 is sleeved on the mainboard 33 and is sealingly connected to the rotation bottom cover 32. The mainboard 33 is electrically connected to both the battery 34 and the second electrode connector 35. The rotation housing 31 has a holding portion 311 on a top of the rotation housing 31. By holding and rotating the holding portion 311 by hand, the rotation assembly 30 can be rotated.

[0024] In an embodiment, the battery 34 is operable to be electrically connected to the first electrode connector via the second electrode connector 35, to power one of the at least two atomization assemblies corresponding to the first electrode connector to atomize the aerosol substrate.

[0025] In a preferred embodiment, the electronic atomization device further includes a cover plate 50. The cover plate 50 defines a clearance hole 51 through which the holding portion 311 extends. The rotation assembly 30 is mounted in the rotation mounting cavity 43, and the cover plate 50 covers the housing 40, so that the rotation assembly 30 is limited in the rotation mounting cavity 43.

[0026] The cover plate 50 has a first connection position identifier 52, a second connection position identifier 53, and a disconnection position identifier 54. The holding portion 311 has a rotation indication arrow 312. The connection position identifiers 53 on the cover plate 50 are in one-to-one correspondence with the atomization assemblies. That is, the first connection position identifier 52 is provided corresponding to the atomization assembly 10, and the second connection position identifier 53 is provided corresponding to the atomization assembly 20. It should be understood that, in other embodiments, the rotation indication arrow 312 may be disposed at positions on the top of the rotation housing 31 other than the holding portion 311.

[0027] In another embodiment, the first connection position identifier 52, the second connection position identifier 53, and the disconnection position identifier 54 may be omitted. That is, the holding portion 311 has the rotation indication arrow 312, where when the rotation indication arrow 312 is aligned with one of the at least two atomization assemblies, the second electrode connector 35 is electrically connected to the one of the at least two atomization assemblies, and when the rotation indication arrow 312 is misaligned with all of the at least two atomization assemblies, the second electrode connector 35 is disconnected from the first electrode connector 12, 22 of each of the at least two atomization assemblies.

[0028] In one embodiment, the at least two atomization assemblies include an atomization assembly 10 and an atomization assembly 20, and the battery 34 is disposed between the atomization assembly 10 and the atomization assembly 20.

[0029] In an embodiment, a center of the atomization assembly 10, a center of the housing 40, and a center of the atomization assembly 20 are collinear with each other.

[0030] The holding portion 311 can be rotated to align the rotation indication arrow 312 with the first connection position identifier 52, the second electrode connector 35 of the rotation assembly 30 extends through the first window 44 to be in contact with the first electrode connector 12 of the atomization assembly 10 (as illustrated in FIG. 4), and in this case, the atomization assembly 10 can

operate. The holding portion 311 can be rotated to align the rotation indication arrow 312 with the second connection position identifier 53, the second electrode connector 35 of the rotation assembly 30 extends through the second window to be in contact with the first electrode connector 22 of the atomization assembly 20 (as illustrated in FIG. 5), and in this case, the atomization assembly 20 can operate. The holding portion 311 can be rotated to align the rotation indication arrow 312 with the disconnection position identifier 54, the second electrode connector 35 of the rotation assembly 30 is disconnected from both the first electrode connector 12 of the atomization assembly 10 and the first electrode connector 22 of the atomization assembly 20 (as illustrated in FIG. 6), and in this case, neither the atomization assembly 10 nor the atomization assembly 20 can operate.

[0031] It should be understood that, in other embodiments of the disclosure, the electronic atomization device may not be provided with the cover plate, the connection position identifier and disconnection position identifier may be directly disposed on the housing 40. The number of the connection position identifiers may be equal to the number of the atomization assemblies. Alternatively, the number of the connection position identifiers may be greater than the number of the atomization assemblies. Each atomization assembly may correspond to one connection position identifier.

Claims

1. An electronic atomization device, comprising:

a housing (40) defining a rotation mounting cavity (43);
at least two atomization assemblies configured to atomize an aerosol substrate to output aerosol, wherein the at least two atomization assemblies are mounted to the housing (40) and spaced apart from one another, each of the at least two atomization assemblies is provided with a first electrode connector (12, 22), and the first electrode connector (12, 22) is disposed close to the rotation mounting cavity (43); and
a rotation assembly (30) comprising a power supply device and a second electrode connector (35) electrically connected to the power supply device, wherein the rotation assembly (30) is mounted in the rotation mounting cavity (43) and rotatable around a center of the rotation mounting cavity (43), and the second electrode connector (35) is electrically connected to or disconnected from the first electrode connector (12, 22) along with rotation of the rotation assembly (30).

2. The electronic atomization device of claim 1, wherein the rotation assembly (30) comprises a rotation housing (31), wherein the power supply device is mounted in the rotation housing (31), the second electrode connector (35) is mounted to a side face of the rotation housing (31), and the rotation housing (31) is mounted in the rotation mounting cavity (43) and rotatable around the center of the rotation mounting cavity (43).

3. The electronic atomization device of claim 1, wherein the housing (40) has connection position identifiers (52, 53) corresponding to the at least two atomization assemblies and a disconnection position identifier (54), and the rotation assembly (30) has a rotation indication arrow (312), wherein when the rotation indication arrow (312) is aligned with one of the connection position identifiers (52, 53), the second electrode connector (35) is electrically connected to the first electrode connector (12, 22) of a corresponding one of the at least two atomization assemblies, and wherein when the rotation indication arrow (312) is aligned with the disconnection position identifier (54), the second electrode connector (35) is disconnected from the first electrode connector (12, 22) of each of the at least two atomization assemblies.

4. The electronic atomization device of any one of claims 1 to 3, wherein the second electrode connector (35) and/or the first electrode connector (12, 22) is a spring-loaded pin.

5. The electronic atomization device of claim 1, wherein the rotation assembly (30) comprises a rotation housing (31), a rotation bottom cover (32) covering and connected to the rotation housing (31), and a rotation-housing silicone sleeve (36), wherein the second electrode connector (35) is fixedly mounted to a side face of the rotation housing (31), the rotation-housing silicone sleeve (36) is sleeved on the rotation housing (31), and the rotation housing (31) has a holding portion (311) on a top of the rotation housing (31).

6. The electronic atomization device of claim 5, wherein the power supply device comprises a battery (34), a mainboard (33), and a mainboard silicone sleeve (37), wherein the battery (34) is mounted in an internal cavity of the rotation housing (31), the mainboard (33) is fixedly mounted in an internal cavity of the rotation bottom cover (32), the mainboard silicone sleeve (37) is sleeved on the mainboard (33) and is sealingly connected to the rotation bottom cover (32), and the mainboard (33) is electrically connected to both the battery (34) and the second electrode connector (35).

7. The electronic atomization device of claim 6, wherein the mainboard (33) is connected to the rotation bot-

tom cover (32) via screws.

8. The electronic atomization device of claim 5, further comprising a cover plate (50), wherein the cover plate (50) defines a clearance hole (51) through which the holding portion (311) extends, and the cover plate (50) covers the rotation mounting cavity (43) to limit the rotation assembly (30) in the rotation mounting cavity (43).

9. The electronic atomization device of claim 8, wherein the cover plate (50) has connection position identifiers (52, 53) corresponding to the at least two atomization assemblies and a disconnection position identifier (54), and the holding portion (311) has a rotation indication arrow (312), wherein when the rotation indication arrow (312) is aligned with one of the connection position identifiers (52, 53), the second electrode connector (35) is electrically connected to the first electrode connector (12, 22) of a corresponding one of the at least two atomization assemblies, and when the rotation indication arrow (312) is aligned with the disconnection position identifier (54), the second electrode connector (35) is disconnected from the first electrode connector (12, 22) of each of the at least two atomization assemblies.

10. The electronic atomization device of claim 8, wherein the holding portion (311) has a rotation indication arrow (312), and wherein when the rotation indication arrow (312) is aligned with one of the at least two atomization assemblies, the second electrode connector (35) is electrically connected to the one of the at least two atomization assemblies, and wherein when the rotation indication arrow (312) is misaligned with all of the at least two atomization assemblies, the second electrode connector (35) is disconnected from the first electrode connector (12, 22) of each of the at least two atomization assemblies.

11. The electronic atomization device of any one of claims 1 to 10, wherein the housing (40) defines atomization mounting cavities for mounting the at least two atomization assemblies and windows, wherein the windows are in communication with the atomization mounting cavities and the rotation mounting cavity (43).

12. The electronic atomization device of claim 11, wherein a center of one of the atomization mounting cavities, a center of another one of the atomization mounting cavities, and a center of one of the windows, and a center of another one of the windows are collinear with each other.

13. The electronic atomization device of any one of claims 6 to 12, wherein the battery (34) is operable to be electrically connected to the first electrode connector (12, 22) via the second electrode connector (35), to power one of the at least two atomization assemblies corresponding to the first electrode connector (12, 22) to atomize the aerosol substrate.

14. The electronic atomization device of any one of claims 6 to 13, wherein the at least two atomization assemblies comprise an atomization assembly (10) and an atomization assembly (20), and the battery (34) is disposed between the atomization assembly (10) and the atomization assembly (20).

15. The electronic atomization device of claim 14, wherein a center of the atomization assembly (10), a center of the housing (40), and a center of the atomization assembly (20) are collinear with each other.

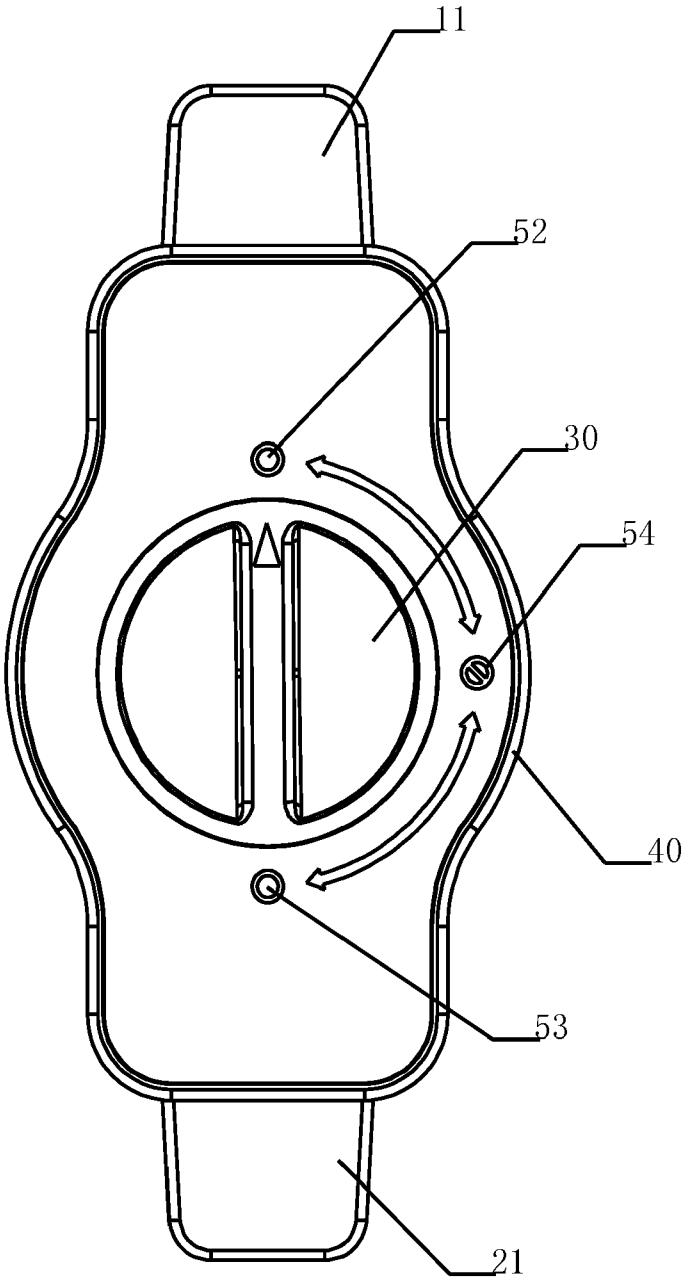

FIG. 1

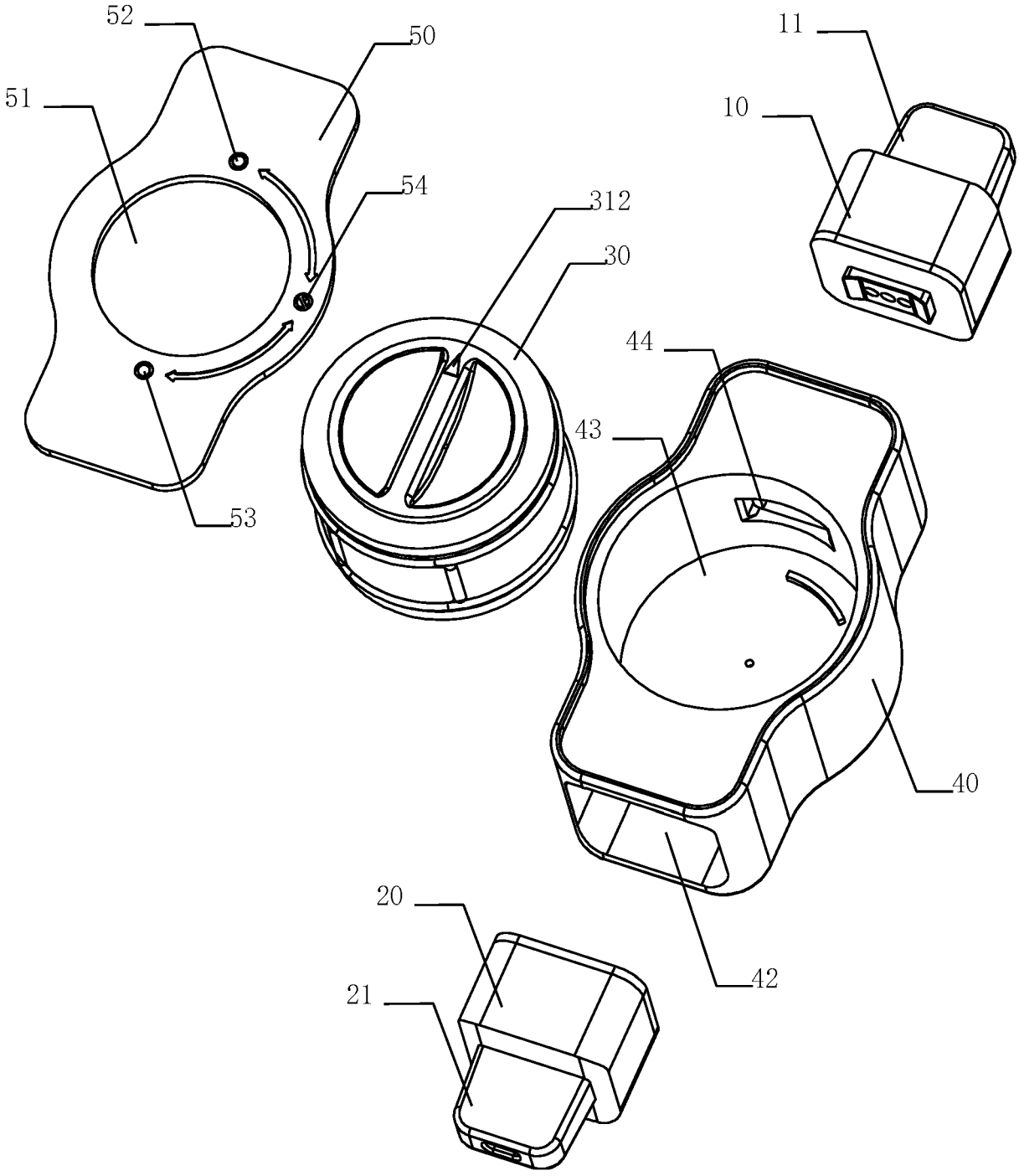

FIG. 2

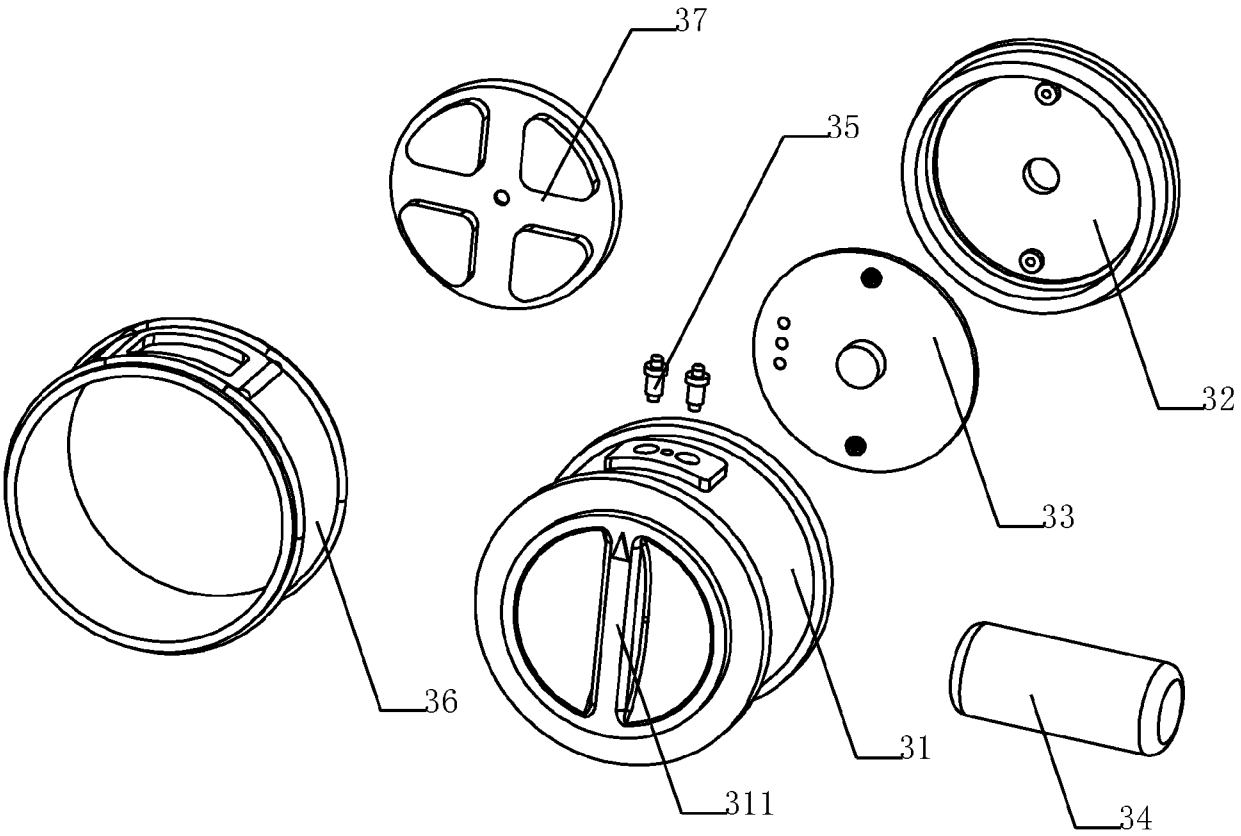

FIG. 3

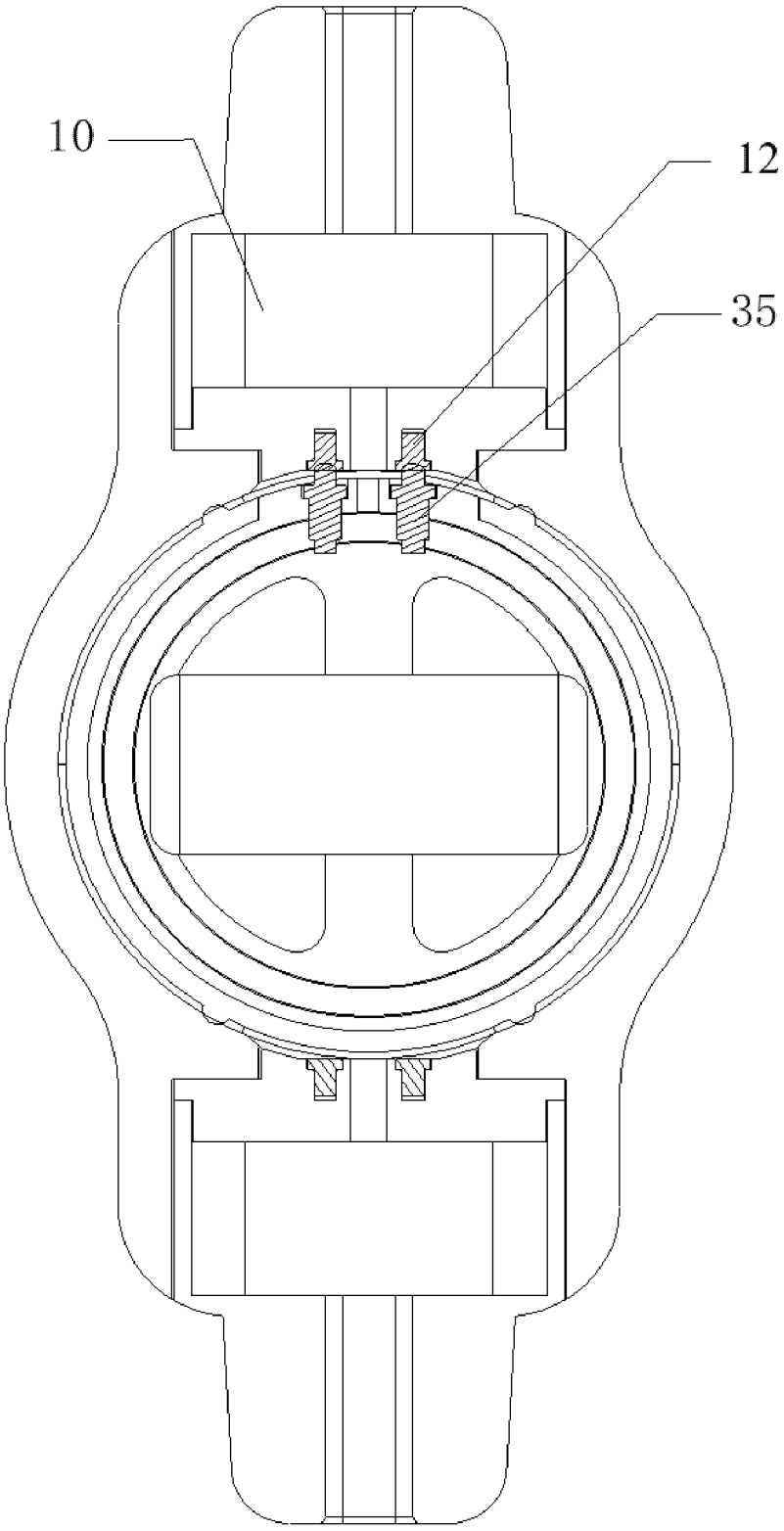

FIG. 4

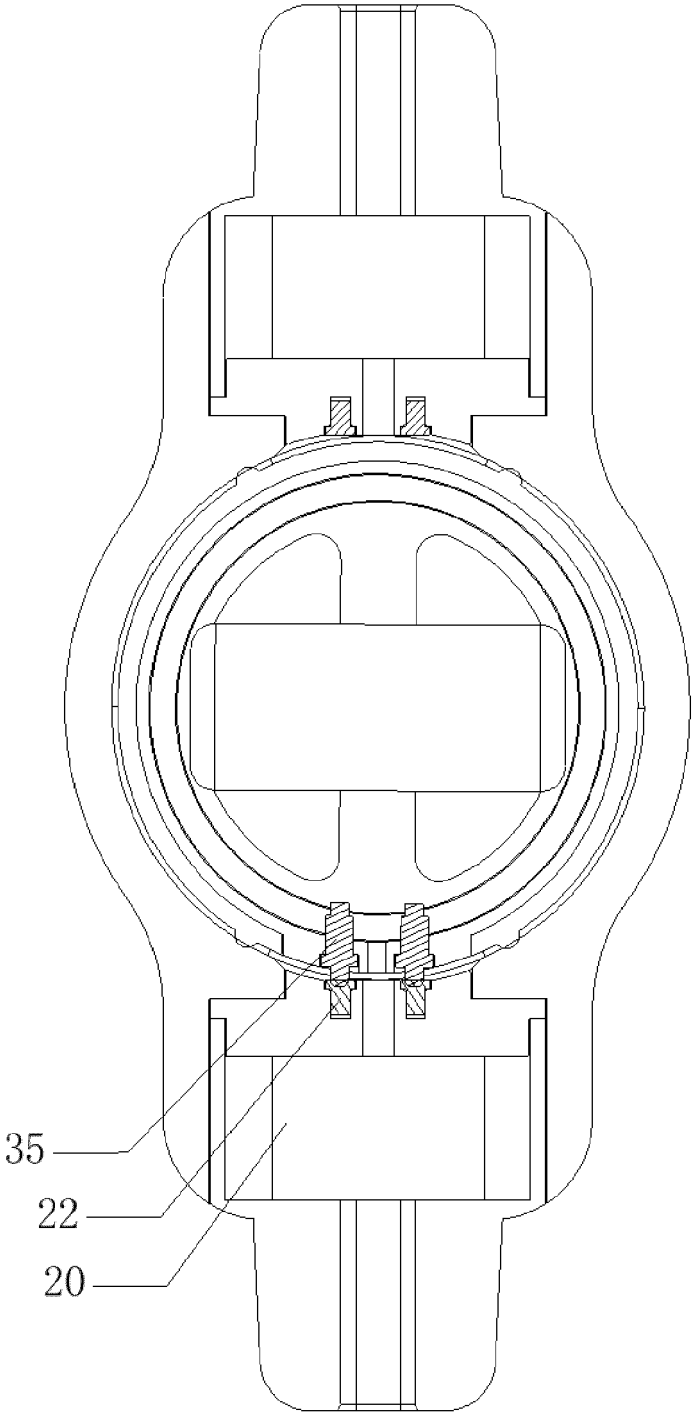

FIG. 5

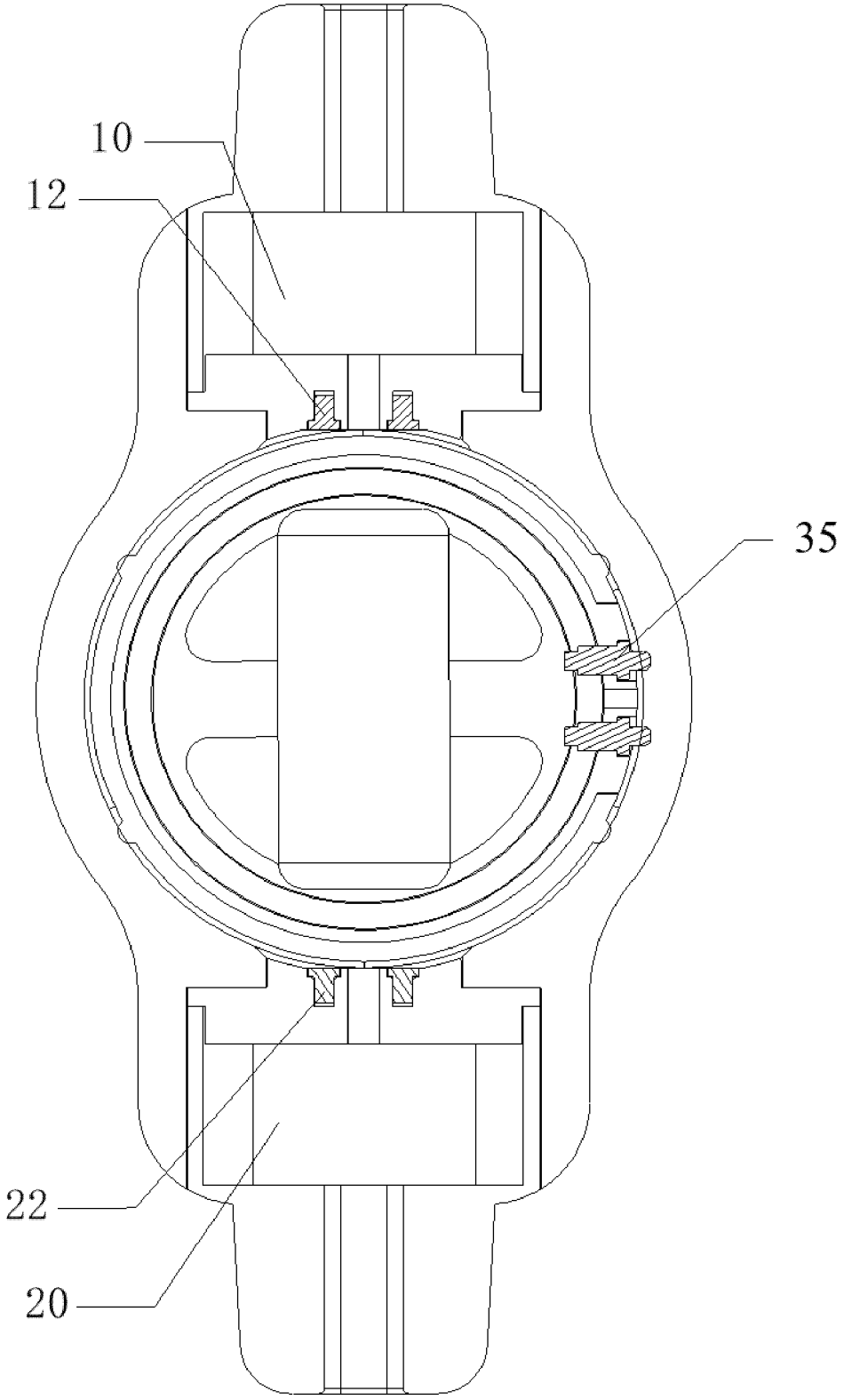

FIG. 6

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 18 3928

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 216 961 520 U (SHENZHEN NEW YUNWU TECH CO LTD) 15 July 2022 (2022-07-15)	1-5, 7-11,13, 14	INV. A24F40/40
Y	* the whole document *	6,12,15	ADD. A24F40/10
Y	CN 110 839 964 A (LIU TUANFANG) 28 February 2020 (2020-02-28)	6	
A	* paragraph [0010] - paragraph [0015]; figure 1 *	1-5,7-15	
Y	WO 2016/127293 A1 (HUIZHOU KIMREE TECHNOLOGY CO LTD [CN]) 18 August 2016 (2016-08-18)	12,15	
A	* paragraphs [0007], [0079] - paragraph [0081]; figures 2, 3, 6 *	1-10,13	
A	WO 2015/127663 A1 (KIMREE HI TECH INC) 3 September 2015 (2015-09-03) * the whole document *	1-15	
A	US 11 224 705 B2 (BOEHRINGER INGELHEIM INT [DE]) 18 January 2022 (2022-01-18) * the whole document *	11,12,15	TECHNICAL FIELDS SEARCHED (IPC) A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 November 2024	Sylvestre, Jonathan

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 18 3928

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.

20-11-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 216961520 U	15-07-2022	NONE	
CN 110839964 A	28-02-2020	NONE	
WO 2016127293 A1	18-08-2016	CN 207151935 U	30-03-2018
		WO 2016127293 A1	18-08-2016
WO 2015127663 A1	03-09-2015	CN 106028856 A	12-10-2016
		US 2016366940 A1	22-12-2016
		WO 2015127663 A1	03-09-2015
US 11224705 B2	18-01-2022	EP 3419707 A1	02-01-2019
		JP 7185529 B2	07-12-2022
		JP 2019506240 A	07-03-2019
		US 2019060586 A1	28-02-2019
		WO 2017144386 A1	31-08-2017

EPO FORM P0459

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