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

(11) **EP 3 932 223 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.01.2022 Bulletin 2022/01

(51) Int Cl.:
A24F 40/42 *(2020.01)* ***A24F 40/40*** *(2020.01)*
A24F 40/10 *(2020.01)*

(21) Application number: **20216942.1**

(22) Date of filing: **23.12.2020**

(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: **29.06.2020 CN 202010607066**
29.06.2020 CN 202021230378 U

(71) Applicant: **Shenzhen Eigate Technology Co., Ltd.**
Shenzhen, Guangdong 518103 (CN)

(72) Inventor: **LIU, Tuanfang**
Shenzhen, Guangdong 518000 (CN)

(74) Representative: **Niburska, Danuta**
Kancelaria Patentowa
Al. 3 Maja 68 B
76-200 Slupsk (PL)

(54) **ATOMIZER**

(57) An atomizer includes a module for e-liquid injection and vapor circulation. the module includes a first silicone fixing part, a first glass tube, and a second glass tube disposed in the first glass tube. The top end of the first glass tube and the top end of the second glass tube are fixed on the first silicone fixing part. The first silicone fixing part includes a side wall including a groove.

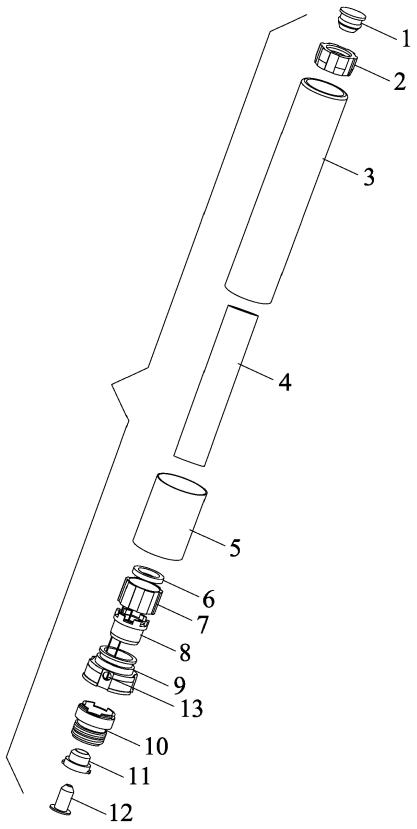

FIG. 1

EP 3 932 223 A1

Description

[0001] The disclosure relates to an atomizer.

[0002] A conventional atomizer comprises an e-liquid injector, an air inlet and an air outlet. The e-liquid injector, the air inlet and the air outlet are independent from each other.

[0003] The disclosure provides an atomizer, comprising a module for e-liquid injection and vapor circulation; the module comprises a first silicone fixing part, a first glass tube, and a second glass tube disposed in the first glass tube; a top end of the first glass tube and a top end of the second glass tube are fixed on the first silicone fixing part; and the first silicone fixing part comprises a side wall comprising a groove.

[0004] In a class of this embodiment, the module further comprises a sealing gasket and a ceramic core; the sealing gasket is a hollow structure and disposed in a bottom end of the ceramic core; and a bottom end of the second glass tube is disposed in the ceramic core and is supported by the sealing gasket or is disposed through a central hole of the sealing gasket.

[0005] In a class of this embodiment, the ceramic core is in the shape of a concave bowl and comprises a heating wire; and the ceramic core comprises an outer wall comprising an air channel.

[0006] In a class of this embodiment, the module further comprises a decorative ring and a fixing base; a bottom end of the decorative ring is disposed on the fixing base; and a bottom end of the first glass tube is disposed through the decorative ring and fixed on the fixing base.

[0007] In a class of this embodiment, the fixing base comprises an air hole.

[0008] In a class of this embodiment, the module further comprises a second silicone fixing part; the ceramic core is disposed on the second silicone fixing part; and the second silicone fixing part is disposed on the fixing base.

[0009] In a class of this embodiment, the second silicone fixing part comprises a gap.

[0010] In a class of this embodiment, the module further comprises a sealing plug disposed on the top end of the second glass tube to seal a top opening of the second glass tube when e-liquid is injected into the second glass tube.

[0011] In a class of this embodiment, the module further comprises a base, an insulation ring, and a joint; the base is fixed in a bottom cavity of the fixing base; the insulation ring is disposed in a bottom cavity of the base to insulate positive and negative terminals of the ceramic core and fix the negative terminal; and the joint is disposed in the insulation ring to fix the positive terminal.

[0012] The disclosure also provides an electronic cigarette comprising the atomizer and a battery assembly.

FIG. 1 is an exploded view of an atomizer in accordance with one embodiment of the disclosure;

FIG. 2 is a schematic diagram of an atomizer in accordance with one embodiment of the disclosure;

FIG. 3 is a sectional view of an atomizer in accordance with one embodiment of the disclosure;

FIG. 4 shows an air flow direction of an atomizer in accordance with one embodiment of the disclosure; and

FIG. 5 is an exploded view of an air passage comprising an air hole, a gap, an air channel, and a groove in accordance with one embodiment of the disclosure.

[0013] To further illustrate, embodiments detailing an atomizer are described below. It should be noted that the following embodiments are intended to describe and not to limit the disclosure.

[0014] As shown in FIGS. 1-3, the disclosure provides an atomizer comprising a sealing plug 1, a first silicone fixing part 2, a first glass tube 3, a second glass tube 4 disposed in the first glass tube 3, a decorative ring 5, a sealing gasket 6, a ceramic core 7, a second silicone fixing part 8, a fixing base 9, a base 10, an insulation ring 11, a joint 12, an air hole 13, a gap 14, an air channel 15, and a groove 16. The sealing gasket 6 is a hollow structure and disposed in the bottom end of the ceramic core 7. The bottom end of the second glass tube 4 is disposed in the ceramic core and is supported by the sealing gasket 6. The first silicone fixing part 2 is disposed on the top end of the first glass tube 3 to fix the top end of the first glass tube 3 and the top end of the second glass tube 4. Specifically, the first silicone fixing part 2 is disposed between the top end of the second glass tube 4 and the top end of the first glass tube 3. The sealing plug 1 is disposed on the top end of the second glass tube 4. The second silicone fixing part 8 is disposed on the fixing base 9 to support the ceramic core 7. The ceramic core 7 is disposed on the second silicone fixing part 8. The bottom end of the decorative ring 5 is disposed on the fixing base 9. The bottom end of the first glass tube 3 is disposed through the decorative ring 5 and fixed on the fixing base 9. The base 10 is fixed in the bottom cavity of the fixing base 9. The insulation ring 11 is disposed in the bottom cavity of the base 10 to insulate the positive and negative terminals of the ceramic core 7 and fix the negative terminal. The joint 12 is disposed in the insulation ring 11 to fix the positive terminal.

[0015] When in use, the e-liquid is injected into the second glass tube 4 and permeates the surface of the ceramic core 7, while no liquid drop forms between the second glass tube 4 and the first glass tube 3. The air hole 13 is disposed on the fixing base 9. The gap 14 is disposed on the second silicone fixing part 8. The air channel 15 is disposed on the ceramic core 7. The groove 16 is disposed on the first silicone fixing part 2. In an inhaling process, the air enters the fixing base 9 via the air hole

13, passes through the gap 14 of the second silicone fixing part 8, and flows along the air channel 15 of the ceramic core 7. The vapor produced in the ceramic core is driven by the air to flow in the space between the first glass tube 3 and the second glass tube 4, and discharges from the groove 16 of the first silicone fixing part 2 for user's inhaling. In certain embodiments, a mouthpiece is disposed on the top end of the first glass 3 to benefit the user's inhaling of the vapor.

[0016] Optionally, the gap 14, the air channel 15, and the groove 16 are a part of the air passage, and can be designed in other forms. For example, the groove 16 is disposed on the inner wall of the first silicone fixing part 2, or is replaced by a plurality of through holes. The first silicone fixing part 2 is fixed in the middle part of the second glass tube 4. The first glass tube 3 is flush with the second glass tube 4, and a mouthpiece is disposed on the top end of the first glass tube 4.

[0017] The following advantages are associated with the atomizer of the disclosure:

1. The air and the vapor flow in the space between the first glass tube and the second glass tube, which is a novel design.

2. The atomizer is in the shape of a concave bowl, which is a novel design.

3. The e-liquid can be directly injected into the atomizer, which is easy to operate.

Claims

1. An atomizer, comprising a module for e-liquid injection and vapor circulation; wherein the module comprises a first silicone fixing part (2), a first glass tube (3), and a second glass tube (4) disposed in the first glass tube (3); a top end of the first glass tube (3) and a top end of the second glass tube (4) are fixed on the first silicone fixing part (2); and the first silicone fixing part (2) comprises a side wall comprising a groove (16).

2. The atomizer of claim 1, wherein the module further comprises a sealing gasket (6) and a ceramic core (7); the sealing gasket (6) is a hollow structure and disposed in a bottom end of the ceramic core (7); and a bottom end of the second glass tube (4) is disposed in the ceramic core (7) and is supported by the sealing gasket (6) or runs through a central hole of the sealing gasket (6).

3. The atomizer of claim 2, wherein the ceramic core (7) is in the shape of a concave bowl and comprises a heating wire; and the ceramic core (7) comprises an outer wall comprising an air channel (15).

4. The atomizer of claim 3, wherein the module further comprises a decorative ring (5) and a fixing base (9); a bottom end of the decorative ring (5) is disposed on the fixing base (9); and a bottom end of the first glass tube (3) runs through the decorative ring (5) and fixed on the fixing base (9).

5. The atomizer of claim 4, wherein the fixing base (9) comprises an air hole (13).

6. The atomizer of claim 5, wherein the module further comprises a second silicone fixing part (8); the ceramic core (7) is disposed on the second silicone fixing part (8); and the second silicone fixing part (8) is disposed on the fixing base (9).

7. The atomizer of claim 6, wherein the second silicone fixing part (8) comprises a gap (14).

8. The atomizer any one of claims 1-7, wherein the module further comprises a sealing plug (1) disposed on the top end of the second glass tube (4) to seal a top opening of the second glass tube (4) when e-liquid is injected into the second glass tube (4).

9. The atomizer of claim 8, wherein the module further comprises a base (10), an insulation ring (11), and a joint (12); the base (10) is fixed in a bottom cavity of the fixing base (9); the insulation ring (11) is disposed in a bottom cavity of the base (10) to insulate positive and negative terminals of the ceramic core (7) and fix the negative terminal; and the joint (12) is disposed in the insulation ring (11) to fix the positive terminal.

10. An electronic cigarette, comprising the atomizer any one of claims 1-7 and a battery assembly.

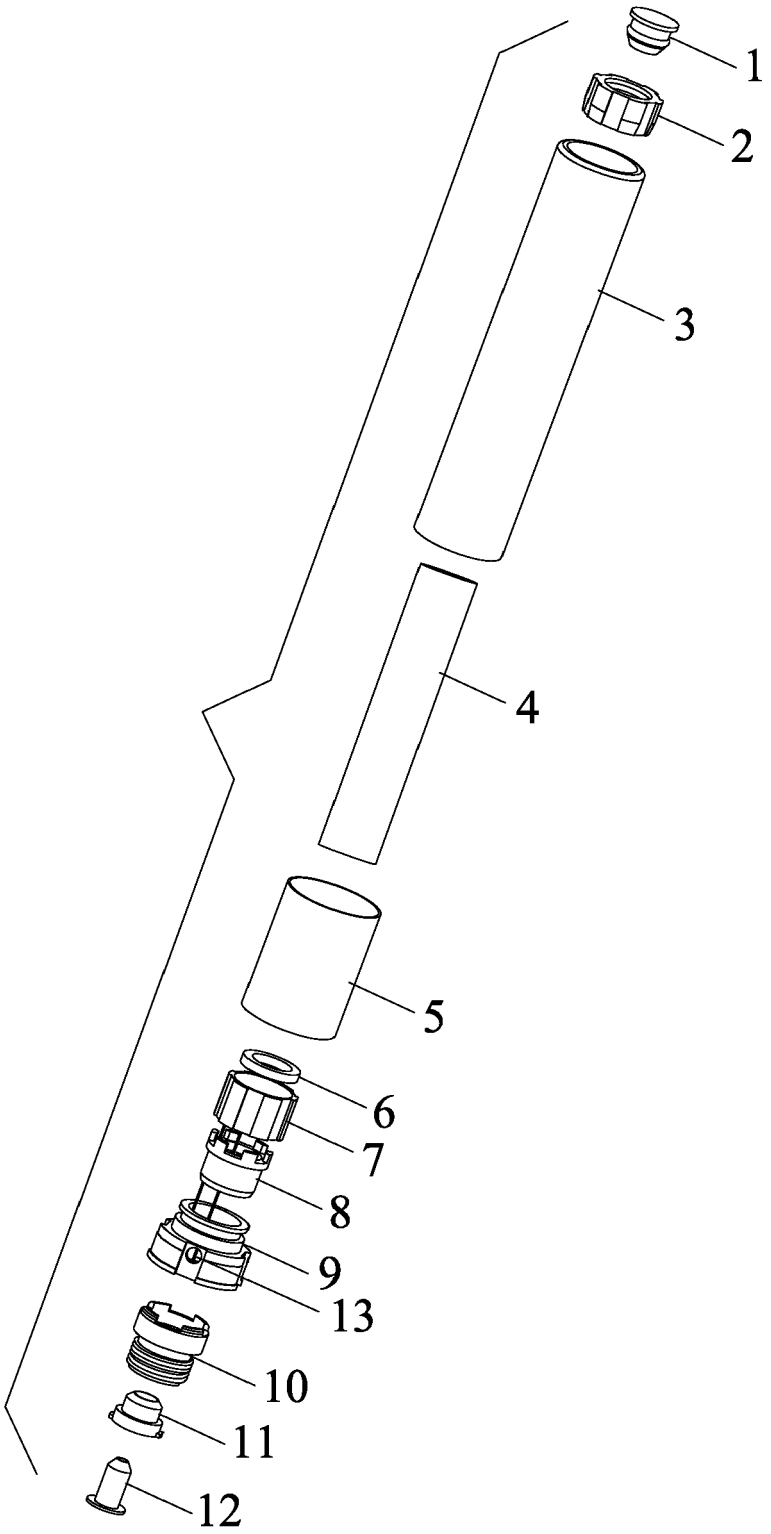

FIG. 1

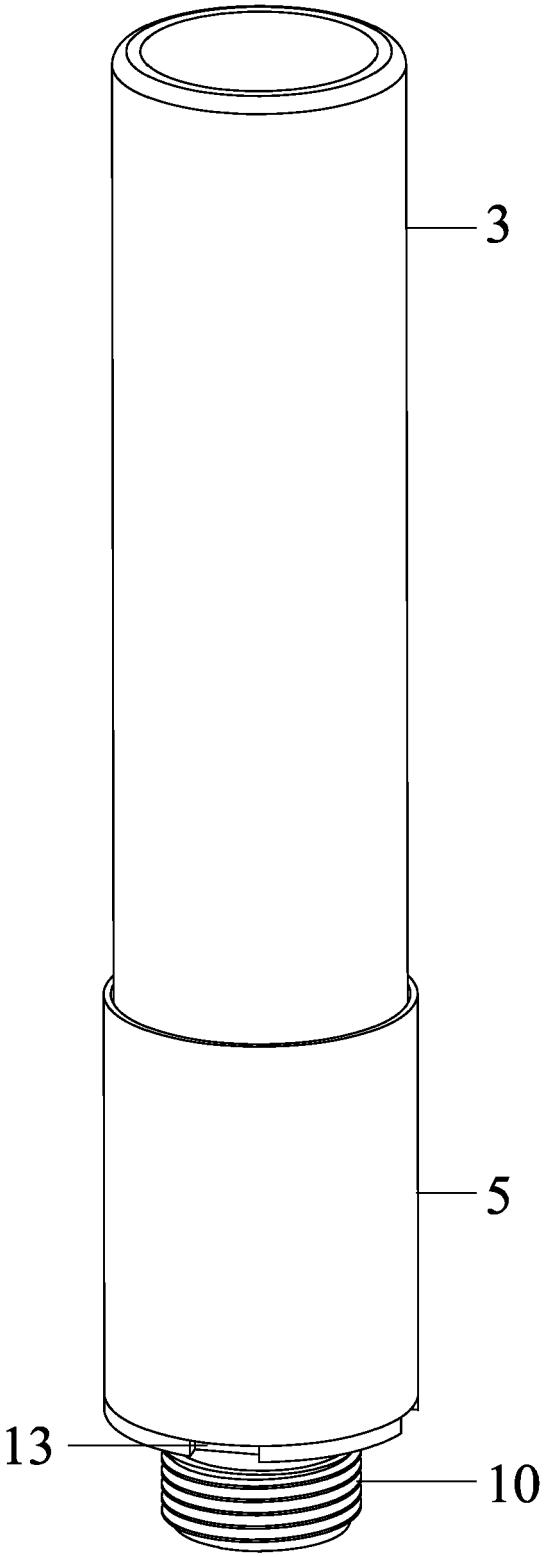

FIG. 2

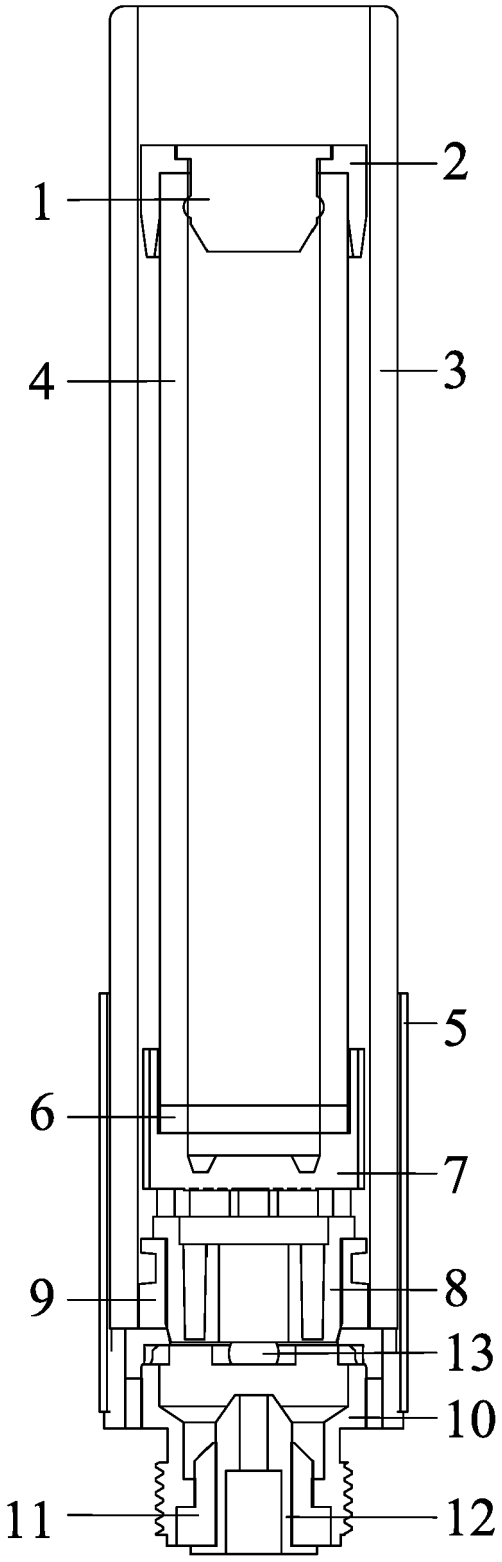

FIG. 3

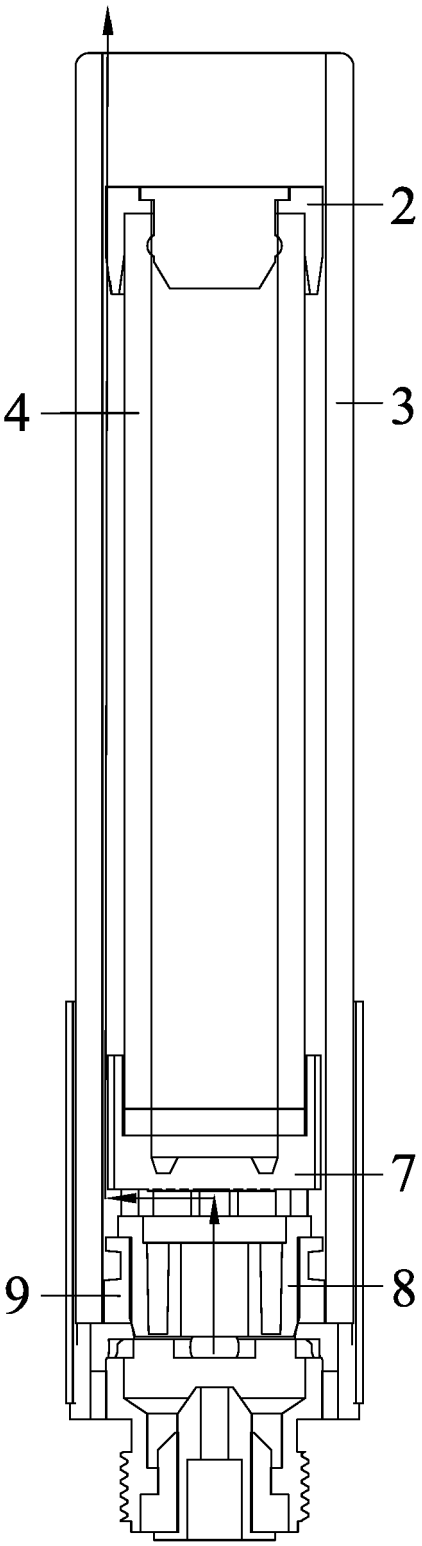

FIG. 4

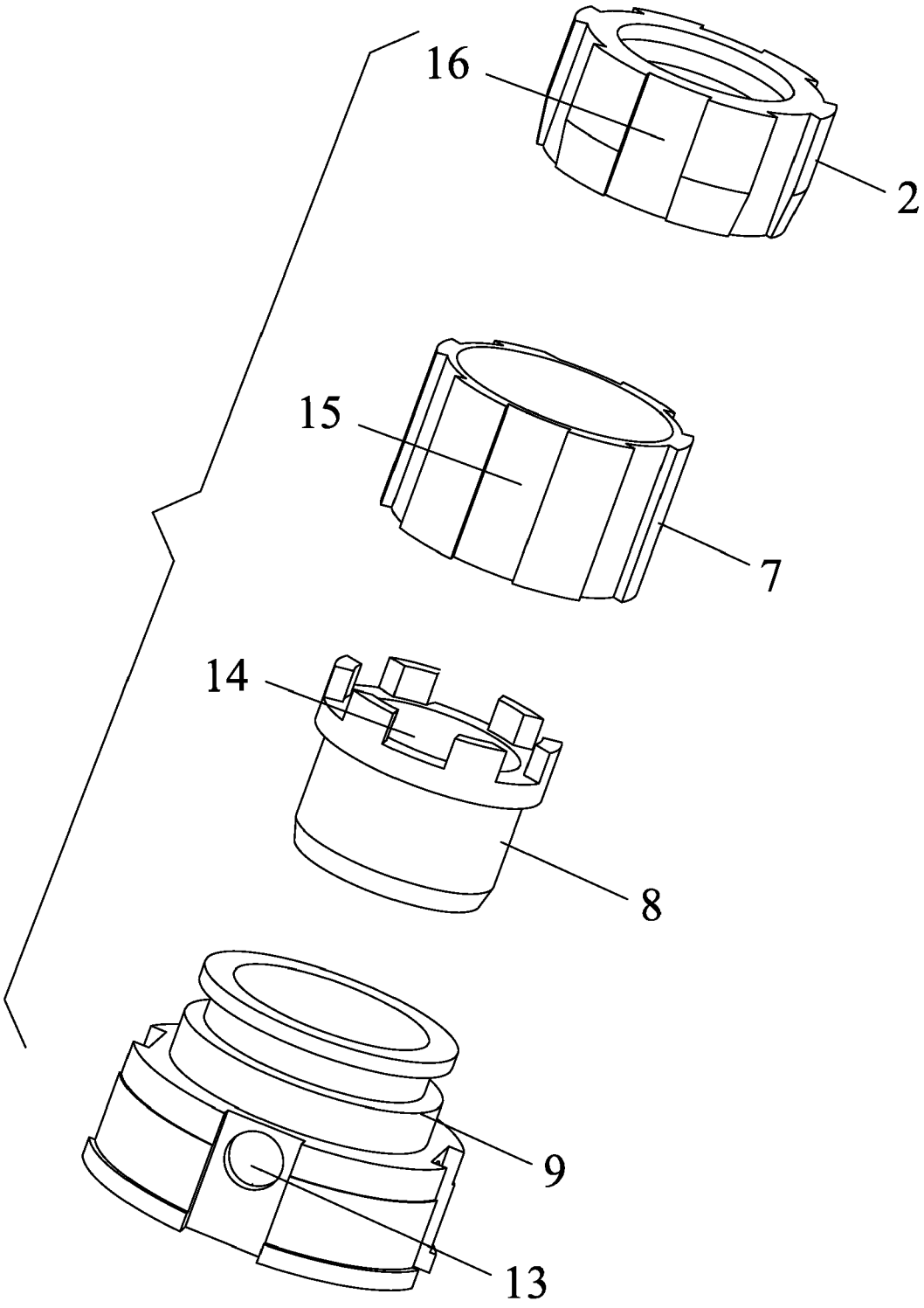

FIG. 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 21 6942

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	US 2014/007891 A1 (LIU QIUMING [CN]) 9 January 2014 (2014-01-09) * paragraphs [0053], [0059], [0061]; claim 1; figures 3, 4 *	1-10	INV. A24F40/42 A24F40/40 A24F40/10
A	CN 210 329 341 U (SHENZHEN QIANHAI BREATHE TECH CO LTD) 17 April 2020 (2020-04-17) * figures 1, 2 *	5	

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
The Hague	2 June 2021	Flügel, Alexander

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 20 21 6942

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.

02-06-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014007891 A1	09-01-2014	AU 2012385404 A1	26-02-2015
		CA 2878505 A1	16-01-2014
		CN 104470385 A	25-03-2015
		EP 2870887 A1	13-05-2015
		JP 5935144 B2	15-06-2016
		JP 2015523077 A	13-08-2015
		KR 20150030268 A	19-03-2015
		RU 2015103964 A	10-09-2015
		US 2014007891 A1	09-01-2014
		WO 2014008623 A1	16-01-2014
CN 210329341 U	17-04-2020	NONE	

EPO FORM P0459

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