(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
03 May 2018 (03.05.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/077363 A1

(51) International Patent Classification:
B65D 81/32 (2006.01) *B65D 21/02* (2006.01)
A24F 47/00 (2006.01) *B05B 11/00* (2006.01)

(21) International Application Number:
PCT/DK2017/050350

(22) International Filing Date:
26 October 2017 (26.10.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA201670849 28 October 2016 (28.10.2016) DK

(71) Applicant: **SMOKE-IT APS** [DK/DK]; Engvangsvej 53, 8464 Galten (DK).

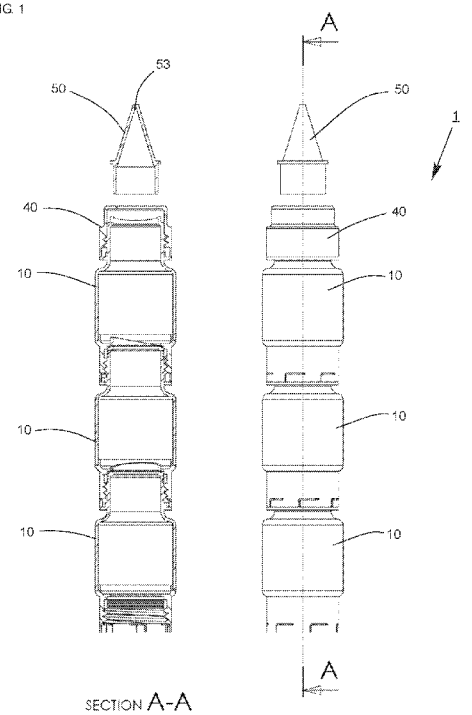
(72) Inventor: **ANDERSEN, Jens**; c/o Smoke-it ApS, Engvangsvej 53, 8464 Galten (DK).

(74) Agent: **GUARDIAN IP CONSULTING I/S**; Diplomvej, Building 381, 2800 Kgs. Lyngby (DK).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(54) Title: A SYSTEM AND A METHOD FOR STORING A PRODUCT CONTAINING NICOTINE

FIG. 1



SECTION A-A

(57) Abstract: A system and a method comprising three or more containers (10), each of said three or more containers (10) comprising a first end (20) and a second end (30) and a chamber (11) configured for storage of a fluid or powder, said first end (20) comprising a first opening (21) to said chamber (11) and said second end (30) comprising a second opening (31) to said chamber (11) wherein that each of said three or more containers (10) comprising a first engagement means (23) positioned at said first end (20) and a complementary second engagement means (33) positioned at said second end (30), said first engagement means (23) on any of the containers (10) is configured to be engaged with said complementary second engagement means (23) on any other of the containers (10) such that the chambers (11) of said three or more containers (10) are connected through said first opening(s) (21) and said second opening(s).

WO 2018/077363 A1

[Continued on next page]

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

A system and a method for storing a product containing nicotine

The present invention relates to a system comprising three or more containers, each of said three or more containers comprising a first end and a second end and a chamber configured for storage of a product, such as fluid or powder, said first end comprising a first opening to said chamber and said second end comprising a second opening to said chamber.

Background of the invention

E-liquid for electronic cigarettes is best enjoyed when the user finds a flavour which is enjoyed and a nicotine level that satisfies the cravings. E-juice comes in varying nicotine concentrations to suit different needs and tastes. Many E-liquid flavours are available and range from tobacco and cigar flavour to sweet and sugary, and electronic cigarettes users have the option of lowering their dose of nicotine gradually, unlike tobacco cigarettes.

Advanced mixing machines with automatic doze and mixing features are available but these machines are very expensive. Less expensive methods are also known, such as using a small electronic weight scale and magnetic stirrer. This method are less expensive however still more complex.

It is known to provide container systems for mixing chemical products such as hair products. These systems comprise two containers, each container containing a chemical product; and as the two containers are coupled together and seals are removed the content within the containers may be mixed before use. Most often two sealed containers are used, and one container is configured for dispensing the mixture and the other container provides a stand/bottom part. Furthermore, as the contained product react chemically when mixed, the container may be coupled without breaking seals between two chambers containing

the products to be mixed, and just before use of the products, the seal is unsealed and the content is mixed ready for use. Such technique is disclosed in US patent application no. 2004/0211742.

Such containers are often very complex structured as they need independent coupling and unsealing means as they are done in different steps. Furthermore the product mixture ration is predetermined and not optional variated.

US7083043 discloses a system comprising several containers, however this system is still rather complex and there are two different types of containers, respectively a cartridge unit and a dispensing unit.

In many cases it is desirable to increase the possible variations of combinations in a more simple way as to customize a product containing nicotine.

Brief description of the invention

It is an object of the present invention to provide a simpler and adaptable system allowing a user to storing and subsequent mix a nicotine containing product.

This is achieved by a system comprising three or more containers where each of said three or more containers comprising a first engagement means positioned at said first end and a complementary second engagement means positioned at said second end, said first engagement means on any of the containers is configured to be engaged with said complementary second engagement means on any other of the containers such that the chambers of said three or more containers are connected through said first opening(s) and said second opening(s), and where the system comprises a first product containing nicotine stored in at least one of the containers and, a product not containing nicotine, such as flavour in liquid form, stored in another one of the containers, and an additional product containing nicotine

stored in at least a third one of the containers having a different concentration and/or amount than said first product containing nicotine, said products are configured to be mixed.

Hereby, a system is provided where at least two containers can be assembled in any desired order to achieved mix of contained material in a specific or personalized nicotine content and/or taste. The user may provide one container containing nicotine combined with a number of containers to dilute the resulting mixed contained material.

In an embodiment, at least one of said first and second openings comprising a closing element configured for closing at least one of said first and second openings to said chambers.

In an embodiment, the closing element to said first opening is a screw cap which comprises a helix-shaped thread which is similar to the second engagement means and complementary shaped to said first engagement means of said three or more containers.

In an embodiment, said closing element of said second opening is a breakable seal positioned at said second opening for closing of said second opening.

In an embodiment, said first end comprises a seal breaking mechanism.

In an embodiment, said seal breaking mechanism comprising a flange extending in the longitudinal direction, said flange having a varying length such that it is configured for penetrating and/or cutting said breakable seal for opening said second opening.

In an embodiment, said seal breaking mechanism extends past said first engagement means in the longitudinal direction in such a manner that when said first engagement means engage with said complementary second engagement means, said breaking mechanism

extends into said second opening and completely or partly past the closing element such that the closing element is penetrated and/or cut by the seal breaking mechanism such that said second opening is unsealed by said breaking mechanism.

Hereby is obtained that two subsequent chambers are connected and stored products can be mixed.

In an embodiment, the system furthermore comprises a nozzle, said nozzle comprises a dispensing opening configured for dispensing of the content of said one or more chambers.

In an embodiment, said nozzle comprising a longitudinal extending flange which is configured for insertion into the first opening of said container.

The present invention further relates to a method for storing of at least one product containing nicotine, said method comprises a system comprising three or more containers according to one or more of the claims 1-9 wherein the method comprises the steps of; providing three or more of said containers, storing of a first product containing nicotine in at least one of the containers and storing of a product not containing nicotine such as flavor in liquid form in another one of the containers, said products are configured to be mixed.

In an embodiment, said method further comprises the steps of; storing of an additional product containing nicotine in at least a third one of the containers having a different concentration and/or amount than said first product containing nicotine.

In an embodiment, said method further comprises the steps of; engaging three or more containers and mixing said stored products.

Brief description of the drawings

An embodiment of the invention will be described in the following with reference to the drawings wherein

Fig. 1 is a longitudinal cross-sectional view and a side view of a system comprising three containers coupled together,

Fig. 2 is two side views and a longitudinal cross-sectional view of a container,

Fig. 3 shows two side views and a cross sectional view of a screw cap,

Fig. 4 is a side view and a longitudinal cross-sectional view of a system comprising three containers,

Fig. 5 is a longitudinal cross-sectional view and a side view of a system comprising three containers and a nozzle coupled together.

Detailed description of the invention with reference to the figures

Figure 1 shows a system comprising three containers engaged receptively in a longitudinal cross-sectional view and a side view of the system.

The system (1) comprising three containers (10), a screw cap (40) and a nozzle (50). The screw cap (40) comprises a top part 41, an internal screw thread portion (42) and an abutting rim (43). The nozzle (50) comprises a cylindrical shaped flange (51) and a frusto-conical shape with the smallest diameter at the free end where a dispensing opening is arranged.

Each container (10) comprises a first end (20) and a second end (30) and a chamber (11) configured for storage of a fluid or powder such as nicotine and oils with flavors. The chamber (11) is positioned intermediate the first and second end.

The first end (20) comprises a first opening (21) to the chamber (11) and the second end (30) comprises a second opening (31) to said chamber (11).

The cylindrical shaped flange (51) of the nozzle is complementary shaped to the cylinder-shaped inner surface of the opening (21) of the containers (10) such that when the screw cap (40) is removed from the container the nozzle can be mounted within the first opening of the container (10).

The system is closed off by a screw cap (40) in the first end (20) and regardless of numbers of engaged containers (11) the system is closed off by a breakable seal (32) in the second end (30). When the screw cap (40) is removed from the container a nozzle (50) may be mounted within the first opening (21).

In figure 2 are shown two side views and a longitudinal cross-sectional view of a container (10).

The container (10) comprises a first end (20) and a second end (30) and a chamber (11) positioned intermediate the first end (20) and the second end (30).

The first end (20) comprises a first opening (21) to the chamber (11), a first engagement means (23) in form of a helix-shaped external thread and a stop collar (25).

The second end (30) comprises a second opening (31) to said chamber (11) and a closing element (32) which closes off the second opening (31), and a complementary second engagement means (33) in form of an internal screw thread (33) which is shaped complementary to the first engagement means (23) positioned at the opposite end for the container (10).

The closing element (32) is shown as a breakable seal.

The system illustrated in figures 1, 4 and 5 comprises three identical shaped containers. Each of the three containers (10) comprises a first engagement means (23) positioned at said first end (20) and a complementary second engagement means (33) positioned at said

second end (30). All three containers comprises identically shaped first engagement means (23) and complementary second engagement means (33), thus allowing to combine a number of containers in a specific construction depending on the desired mixing ration of the contained content. If a user desire to obtain mild nicotine content mixed with a specific/personalized ratio, he/she may provide one container containing nicotine combined with a number of containers to dilute the mixed result.

The first engagement means (23) is configured to be engaged with said complementary second engagement means (33) such that the chambers (11) of said three or more containers (10) are structurally connected through said first and second openings (21,31).

In figure 2 the second opening (31) comprises a closing element (32) configured for closing of the second opening (31) to the chambers (11).

The embodiment of the container (10) illustrated in figure 2 has a total length from the seal breaking mechanism (22) at the first end of the container to the second end (30) of the container at 57 mm. The outer diameter of the first end (20) is 19 mm, the outer surface of the intermediate positioned chamber (11) has a diameter of 27 mm and the second end (30) has a diameter of 24 mm.

The closing element (32) of said second opening (31) is illustrated as a breakable seal positioned within said second opening (31) for closing of said second opening.

The first end (20) comprises a seal breaking mechanism (22).The seal breaking mechanism (22) is a flange extending in the longitudinal direction, said flange having a varying length.

The seal breaking mechanism (22) is arranged distally relative to said first engagement means (23) in such a manner that when said first engagement means (23) engage with said complementary second engagement means (33), the breaking mechanism (22) extend into the second opening (31) and the closing element (32) is broken by the

breaking mechanism (22) and thereby unsealing said second opening (31). The breaking mechanism (22) cuts said breakable seal and unseals the second opening (31) during rotation of a container relative to another container as the engagement means (23,33) engage. Hereby is obtained that two subsequent containers and the chambers (11) are joint and the content of the chamber may be mixed.

Figure 3 shows a closing element to the first opening (21) in shape of a screw cap (40). The screw cap (40) comprises a helix-shaped thread (42) which is identically shaped to the second engagement means (33) and complementary shaped to the first engagement means (23) of the containers (10) used in the system.

The embodiment of the screw cap illustrated in figure 3 has a total height (in the longitudinal direction of the system) from the top part (41) to the abutting rim (43) of 17 mm. The outer diameter of the screw cap is 24.2 mm.

Figure 4 shows a side view and a longitudinal cross-sectional view of a system comprising three containers (10). The system furthermore comprises a nozzle (50), said nozzle (50) comprises a dispensing opening (53) configured for dispensing of the content of said one or more engaged chambers (11).

The nozzle (50) is illustrated having a frusto-conical shape having a dispensing opening (53) arranged at the smallest diameter of the nozzle. In the opposite end the nozzle comprises a cylindrical shaped flange (51) which is complementary shaped to the inner surface of the opening (21) of the containers (10) such that when the screw cap (40) is removed from the container, the nozzle can be mounted within the first opening of the container (10) as illustrated in figure 5.

In figure 5 a dispensing nozzle (50) is mounted within a first opening of a first container, the subsequent second container is engaged to the first container by engaging the complementary internal and external

screw threads. During engagement the breakable seal is penetrated by the seal breaking mechanism (22).
Figure 5 illustrates that several containers may be coupled together in any desired combination as each of the first engagement means (23) are identical in shape, and likewise each of the complementary second engagement means (33) are identical in shape and complementary to the first engagement means (23).

Furthermore, the system is used in a method for storing of at least one product containing nicotine, and at least one product without nicotine, such as fluids with different flavors configured to be mixed with nicotine in relation to electronic cigarettes.

The method comprises the steps of providing three or more containers (10), storing of a product containing nicotine in at least one container chamber (11) and storing of a product not containing nicotine such as a liquid to be mixed with said product containing nicotine.
A user may mix a product containing nicotine with different flavors to obtain a desired mixed product containing both nicotine and fluids not containing nicotine.
Furthermore, the method comprises the step of storing of an additional product containing nicotine in at least one container (10) having a different concentration and/or amount than said first product containing nicotine.
The method further comprises the steps of engaging three or more containers (10) and mixing said stored products.

Claims

1. A system (1) comprising three or more containers (10), each of said three or more containers (10) comprising a first end (20) and a second end (30) and a chamber (11) configured for storage of a product such as a fluid or powder, said first end (20) comprising a first opening (21) to said chamber (11) and said second end (30) comprising a second opening (31) to said chamber (11), each of said three or more containers (10) comprising a first engagement means (23) positioned at said first end (20) and a complementary second engagement means (33) positioned at said second end (30), said first engagement means (23) on any of the containers (10) is configured to be engaged with said complementary second engagement means (23) on any other of the containers (10) such that the chambers (11) of said three or more containers (10) are connected through said first opening(s) (21) and said second opening(s), **characterized in** that the system comprises a first product containing nicotine stored in at least one of the containers (10) and, a product not containing nicotine, such as flavour in liquid form, stored in another one of the containers (10), an additional product containing nicotine stored in at least a third one of the containers (10) having a different concentration and/or amount than said first product containing nicotine, said products are configured to be mixed.

2. A system according to claim 1, wherein at least one of said first and second openings (21,31) comprising a closing element (40,32) configured for closing at least one of said first and second openings (21,31) to said chambers (11).

3. A system according to any one of the preceding claims, wherein said closing element to said first opening (21) is a screw cap (40) which comprises a helix-shaped thread (42) which is similar to the second

engagement means (33) and complementary shaped to said first engagement means (23) of said three or more containers (10).

4. A system according to any one of the preceding claims, wherein said closing element (32) of said second opening (31) is a breakable seal positioned at said second opening (31) for closing of said second opening.

5. A system according to any one of the preceding claims, wherein said first end (20) comprises a seal breaking mechanism (22).

6. A system according to any one of the preceding claims, wherein said seal breaking mechanism (22) is a flange extending in the longitudinal direction, said flange having a varying length such that it is configured for penetrating and/or cutting said breakable seal for opening said second opening (31).

7. A system according to any one of the preceding claims, wherein said seal breaking mechanism (22) extends past said first engagement means (23) in the longitudinal direction in such a manner that when said first engagement means (23) engage with said complementary second engagement means (33), said breaking mechanism (22) extends into said second opening (31) and completely or partly past the closing element (32) such that the closing element (32) is penetrated and/or cut by the seal breaking mechanism (22) such that said second opening (31) is unsealed by said breaking mechanism (22).

8. A system according to any one of the preceding claims, wherein the system furthermore comprises a nozzle (50), said nozzle (50) comprises a dispensing opening (53) configured for dispensing the content of said one or more chambers (11).

9. A system according to any one of the preceding claims, wherein said nozzle (50) comprising a longitudinal extending flange (51) which is configured for insertion into the first opening (21) of said container.

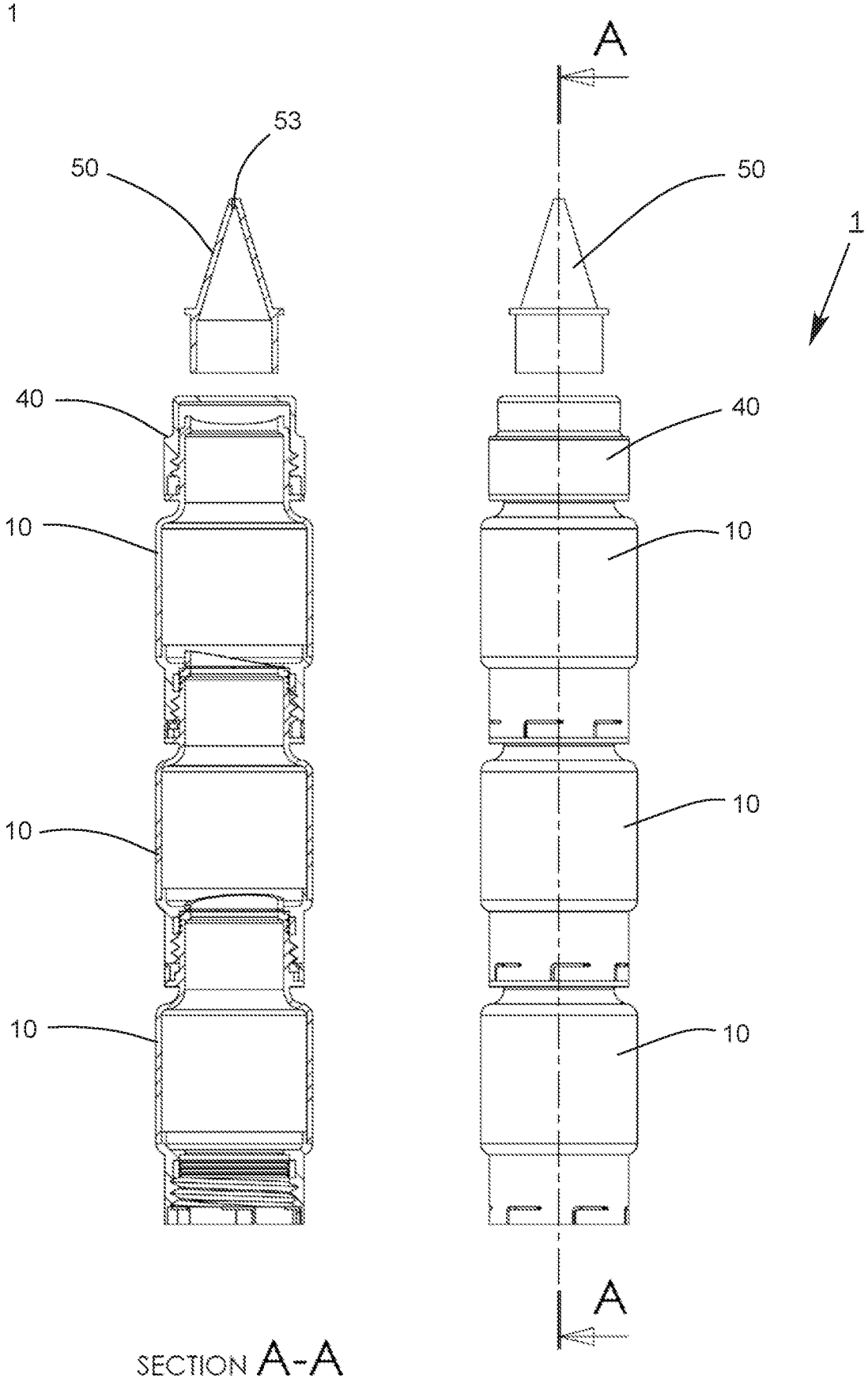
10. A method for storing of at least one product containing nicotine, said method comprises a system comprising three or more containers (10) according to one or more of the claims 1-9, wherein the method comprises the steps of;

- providing three or more of said containers (10),
- storing of a first product containing nicotine in at least one of the containers and,
- storing of a product not containing nicotine, such as flavour in liquid form, in another one of the containers, said products are configured to be mixed.

11. A method according to claims 10, wherein said method further comprises the steps of;

- engaging two or more containers (10), and
- mixing said stored products.

FIG. 1



SECTION A-A

FIG. 2

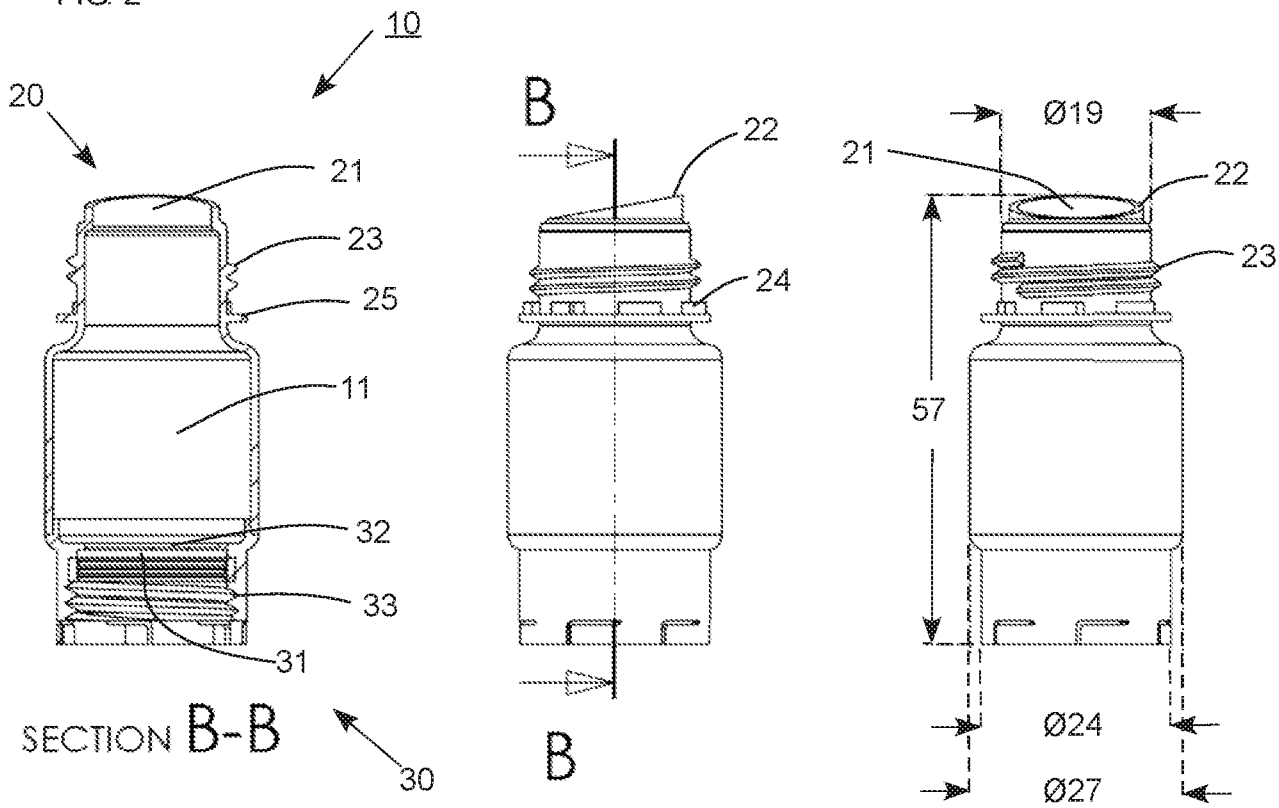

10
20
21
23
25
11
32
33
31
SECTION B-B
30
B
22
24
B
Ø19
21
22
23
57
Ø24
Ø27

FIG. 3

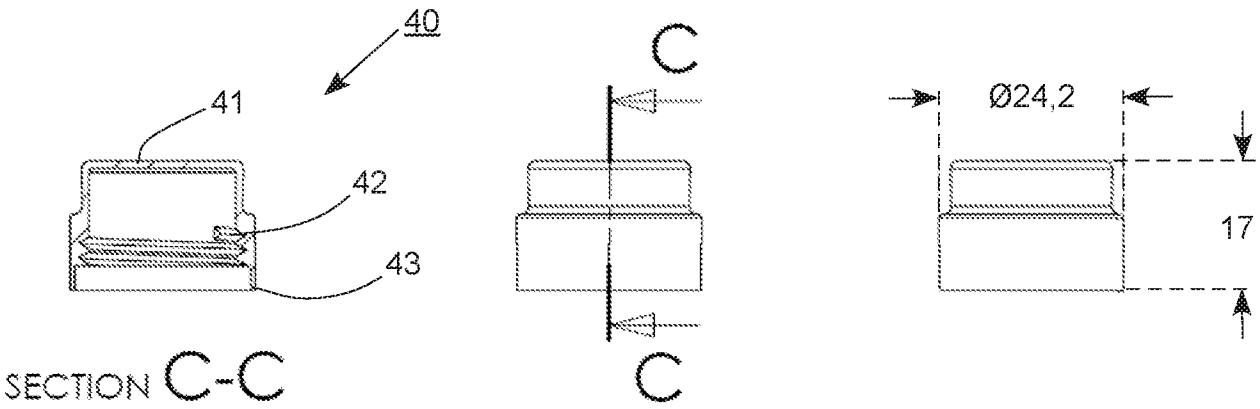
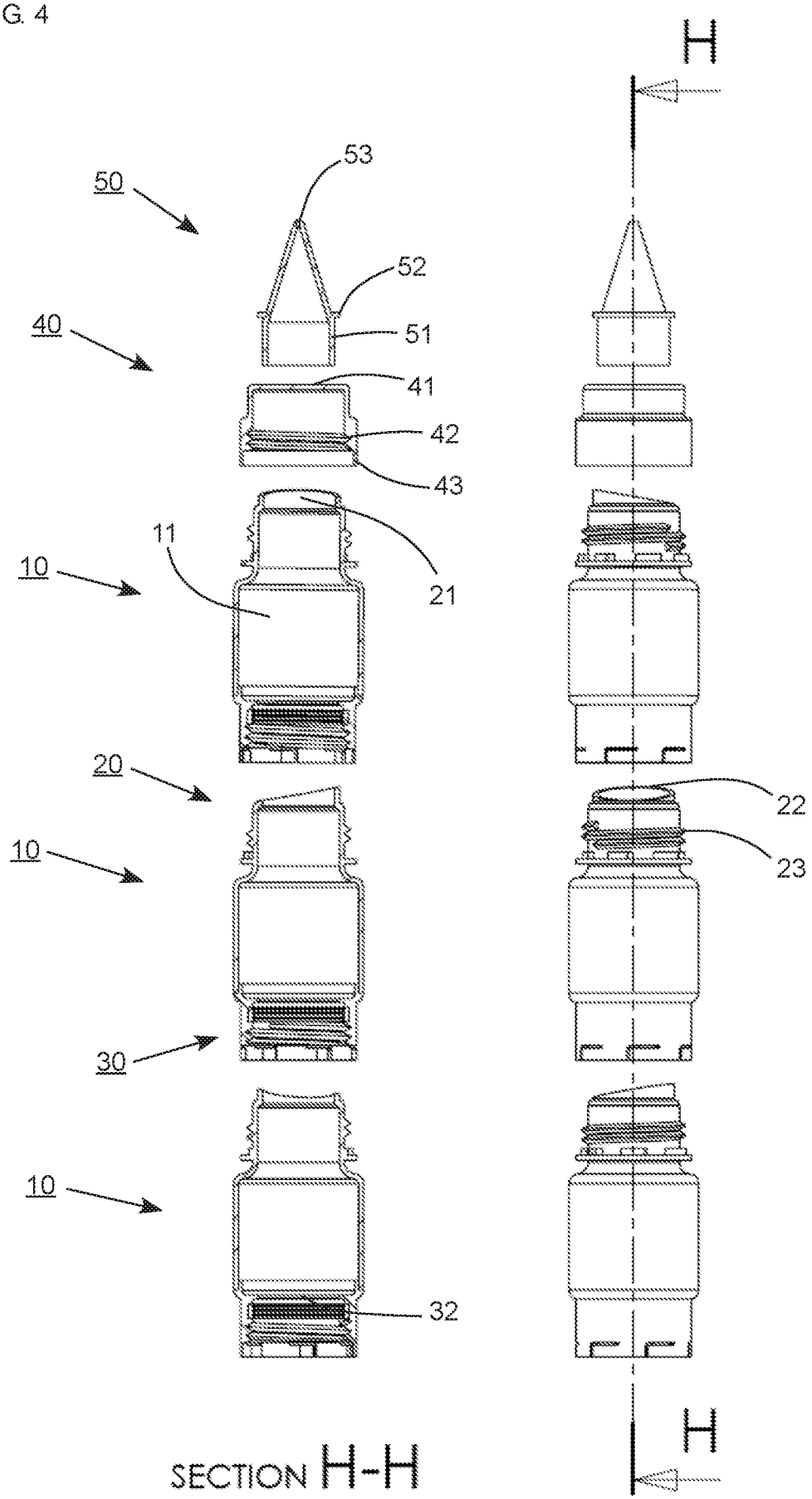
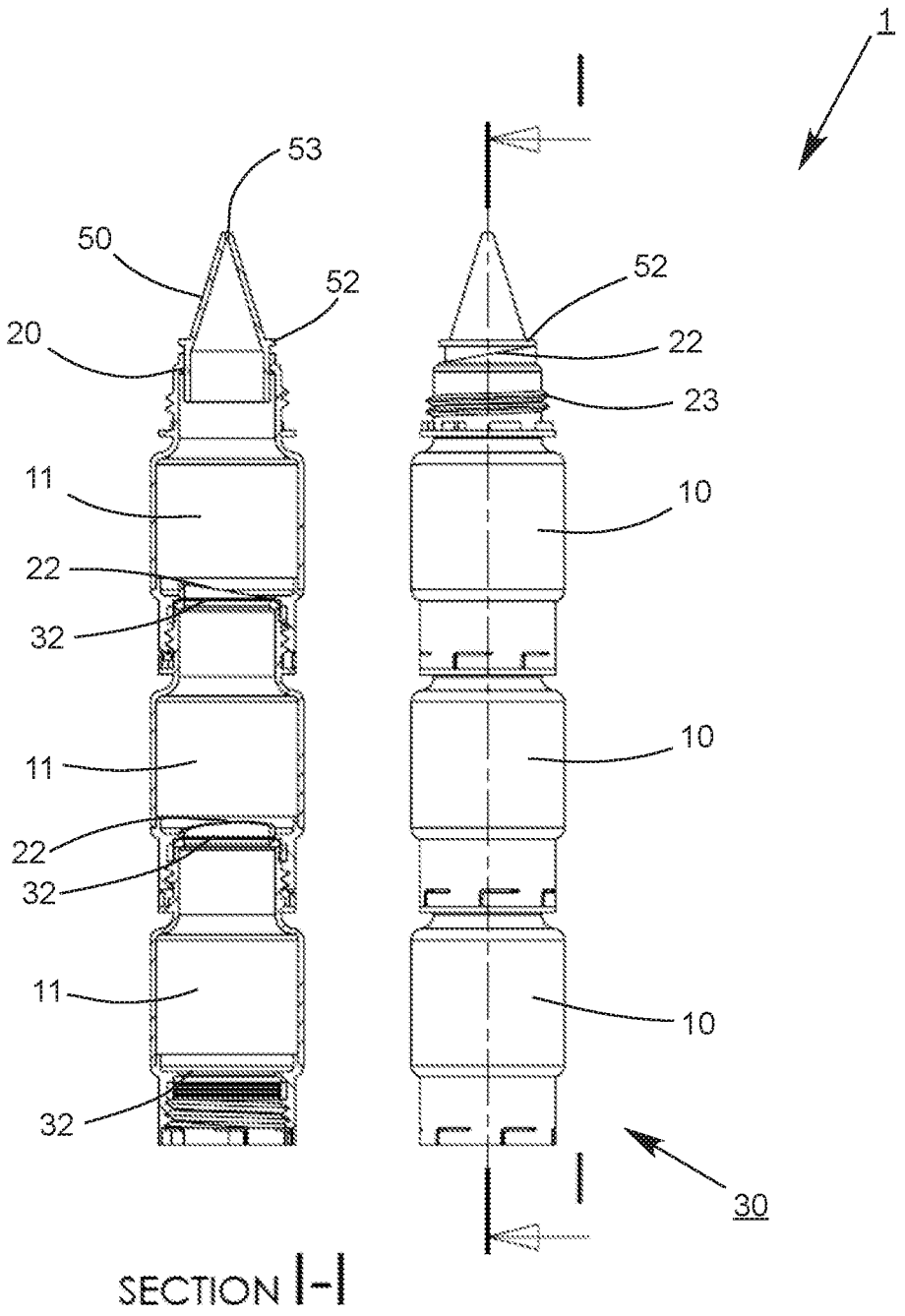

40
41
42
43
SECTION C-C
C
C
Ø24,2
17

FIG. 4



SECTION H-H

FIG. 5



SECTION I-I

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2017/050350

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D81/32 A24F47/00 B65D21/02 B05B11/00
ADD.

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)
B65D A24F B05B

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 579 858 A (FERNOE OVE B [SE] ET AL) 1 April 1986 (1986-04-01) abstract; figure 6 column 3, lines 25-36	1-11
Y	US 2008/169265 A1 (HUANG TZU CHIAO [TW] ET AL) 17 July 2008 (2008-07-17) abstract; figures paragraphs [0005], [0040] - [0042]	1-11

☐ 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
8 February 2018	19/02/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Serrano Galarraga, J

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2017/050350

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4579858 A	01-04-1986	CA 1217317 A	03-02-1987
		CH 663154 A5	30-11-1987
		DE 3401763 A1	26-07-1984
		FI 840241 A	22-07-1984
		FR 2539627 A1	27-07-1984
		IL 70577 A	31-12-1986
		IT 1178834 B	16-09-1987
		JP H0532017 B2	14-05-1993
		JP S59135878 A	04-08-1984
		SE 461698 B	19-03-1990
		SE 8400045 L	22-07-1984
		US 4579858 A	01-04-1986
US 2008169265 A1	17-07-2008	NONE	