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(54) **APPARATUS ADAPTED FOR DISPENSING AN AEROSOL**

(57) The present invention relates to an apparatus (101, 102, 103) adapted for dispensing an aerosol, the apparatus being configured for enabling a user to selectively add a further aerosol to the aerosol such to facilitate variation in the flavoring over different spray application instances.

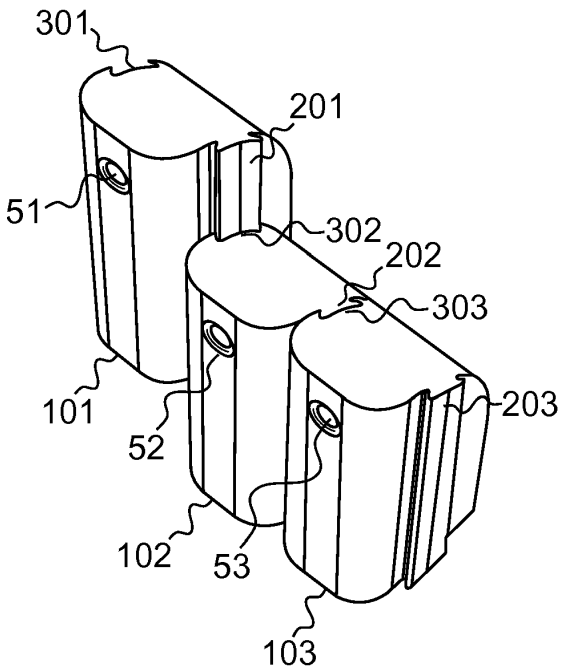

Fig. 3

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Description

FIELD OF INVENTION

[0001] The present invention relates to an apparatus adapted for dispensing an aerosol, in particular to an apparatus adapted for varying a multi flavored aerosol.

BACKGROUND OF THE INVENTION

[0002] Devices for dispensing aerosol can be used in various ways. One example is the use for spraying droplets of a liquid containing at least one active ingredient, such as nicotine for example. It may be desirable for a user to easily vary the combination of flavors in the aerosol. Users which prefer variation in the flavors in the aerosol over different spray application instances would have a burden to carry more than one spray.

SUMMARY OF THE INVENTION

[0003] In one aspect of the present invention, an apparatus adapted for dispensing an aerosol is disclosed that enables a user to easily vary a multi flavored aerosol. The apparatus is configured for enabling a user to selectively add at least one further aerosol.

[0004] The characteristics, features and advantages of this invention and the manner in which they are obtained as described above, will become more apparent and be more clearly understood in connection with the following description of exemplary embodiments, which are explained with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] In the drawings, same element numbers indicate same elements in each of the views:

Figure 1 is a schematic perspective view of an apparatus according to an exemplary embodiment of the invention,

Figure 2 is a schematic perspective view of the apparatus according to the exemplary embodiment of Fig. 1 from a rear perspective, and

Figure 3 is a schematic perspective view of the apparatus according to the exemplary embodiment of Fig. 1 where one of the first dispenser units is partly removed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0006] Figure 1 shows a schematic perspective view of an exemplary embodiment of the present invention.

[0007] The apparatus according to an exemplary embodiment of the invention is formed as a modular mouth spray system for delivery of a nicotine/caffeine based solution allowing a user to easily carry multiple flavors/solutions in one connected apparatus. The apparatus comprises a first aerosol dispenser unit 101, a second aerosol dispenser unit 102 and a third aerosol dispenser unit 103. Each of the aerosol dispenser units 101, 102, 103 comprises a liquid storage container (not shown) adapted to store a liquid, an activator (not shown) and a spray nozzle 51, 52, 53.

[0008] The activator may be arranged to initiate the activation of a spray nozzle 51, 52, 53 when a user moves the apparatus in close proximity to an open mouth which may be detected by an appropriate sensor, however, in some embodiments such activator could be replaced by a push button and a user could cause the spray nozzle 51, 52, 53 to activate by pressing on the button. In other embodiments other means for activating the device could be provided.

[0009] Upon acting on the activator, liquid from the liquid storage container is dispensed to the spray nozzle 51, 52, 53 which transforms the dispensed liquid into the aerosol. Thereby the aerosol is sprayed in a spray direction. The liquid may be dispensed from the liquid storage container to the spray nozzles 51, 52, 53 by using a dispensing unit.

[0010] The liquid storage container may be a capsule filled with a liquid. However, the liquid storage container may also be any other kind of receptacle such as a tank system that can have an arbitrary form or shape and also be located in an arbitrary position inside a housing of each of the aerosol dispenser units 101, 102, 103. The liquid may be flavored or flavorless and may include glycerol. However, the liquid may also include propylene glycol, triethylene glycol, polyhydric alcohol, tetraethylene glycol, aliphatic ester of carboxylic acid, such as methyl stearate, dimethyl dodecanedioate, dimethyl tetradecanedioate, water and the like.

[0011] Each of the liquid storage containers may carry a flavoured material respectively. Each of the aerosol dispenser units 101, 102, 103 may carry different flavoured materials (contained in the liquid), for example where a first flavoured material contained in the liquid of the liquid storage container of the first aerosol dispenser unit 101 is a menthol extract, a second flavoured material contained in the liquid of the liquid storage container of the second aerosol dispenser unit 102 is a vanilla extract while a third flavoured material contained in the liquid of the liquid storage container of the third aerosol dispenser unit 103 is a combination of nicotine and caffeine. However, any kinds of flavoured materials may be carried by the liquid storage containers of the aerosol dispenser units 101, 102, 103.

[0012] These other materials may include esters, such as isoamyl acetate, linalyl acetate, isoamyl propionate, linalyl butyrate and the like; natural essential oils as plant essential oils, such as spearmint, peppermint, cassia, jasmine and the like; animal essential oils, such as musk, amber, civet, castor and the like; simple flavouring ma-

terials, such as anethole, limonene, linalool, eugenol and the like; hydrophilic flavour components such as a leaf tobacco extract or natural plant flavouring materials such as licorice, St. John's wort, a plum extract, a peach extract and the like; acids such as a malic acid, tartaric acid, citric acid and the like; sugars such as glucose, fructose, isomerized sugar and the like; and polyhydric alcohols such as propylene glycol, glycerol, sorbitol and the like. Furthermore, it is also possible to combine several different flavored materials from those mentioned above in order to make new flavored materials. Moreover, it is possible to adsorb any flavour onto a solid material and to use this material as flavoured material within any of the aerosol dispenser units 101, 102, 103.

[0013] The activator may comprise a pump for pumping air into the liquid storage container thereby expelling the liquid. Alternatively or additionally the activator may comprise a valve and the liquid is contained in the liquid storage container under pressure.

[0014] The aerosol dispenser units 101, 102, 103 share a common modular arrangement. In the exemplary embodiment depicted in Figures 1 to 3, each of the aerosol dispenser units 101, 102, 103 comprises, on one of two opposing sides, a coupling element 201, 202, 203 and, on the other of the two opposing sides, a counter-coupling element 301, 302, 303. In the depicted example, the opposing sides are parallel to the spray direction and each other, but the invention is not limited thereto.

[0015] The coupling elements 201, 202, 203 are formed as tongues or as keys in the form of protrusions which extend in an extension direction. The counter-coupling elements 301, 302, 303 are formed as corresponding grooves or slots which extend in said extension direction. In the depicted example, the extension direction is perpendicular to the spray direction, but the invention is not limited thereto.

[0016] In the depicted example, the coupling elements 201, 202, 203 are undercut thereby having a protrusion. Hence, sections perpendicular to the extension direction through the coupling elements 201, 202, 203 reveal dovetail-profiles, or dovetail-forms, of the coupling elements 201, 202, 203. Furthermore, sections perpendicular to the extension direction through the counter-coupling elements 301, 302, 303 reveal corresponding grooves formed as dovetail-profiles, or dovetail-forms, of the counter-coupling elements 301, 302, 303.

[0017] Other exemplary embodiments of the present invention comprise other undercut profiles, for example a T-profile.

[0018] The grooves of the counter-coupling elements 301, 302, 303 are formed as an elongated slot and the protrusion of the coupling elements 201, 202, 203 are formed as a corresponding key that can be forcibly inserted into the respective groove and forcibly removed from the respective groove. The size and shape of coupling elements 201, 202, 203 and counter-coupling elements 301, 302, 303 is selected such to assure that pairs of corresponding coupling elements/counter-coupling elements are firmly fixed to each other to be in a locked state but can be conveniently removed or released from each other by a user to be in an unlocked state. According to an exemplary embodiment, the size of the protrusions of the coupling elements 201, 202, 203 is slightly smaller than the size of the grooves of the counter-coupling elements 301, 302, 303. A clearance of the protrusions inside the grooves may be less than 1 mm, more preferably less than 0.5 mm and still more preferably less than 0.1 mm along a direction perpendicular to a longitudinal direction of the protrusions/grooves.

[0019] According to an exemplary embodiment, the coupling elements 201, 202, 203 and counter-coupling elements 301, 302, 303 completely extend along a side of each of the aerosol dispenser units 101, 102, 103 which allows improved characteristics of coupling the coupling elements 201, 202, 203 and counter-coupling elements 301, 302, 303 in and out along upper or lower edges of the side surfaces of the aerosol dispenser units 101, 102, 103. That is, a user is able to easily fix two aerosol dispenser units 101, 102, 103 to one another by contacting respective edges and aligning longitudinal axes of two aerosol dispenser units 101, 102, 103 thereby engaging respective coupling and counter-coupling elements. In this sense, upper and lower terminal portions of the coupling elements 201, 202, 203 and the counter-coupling elements 301, 302, 303 are flushed with the upper and lower surfaces of the housing of at least one (preferably each) of the aerosol dispenser units 101, 102, 103 which results in improved coupling characteristics while simultaneously achieving a compact design and preventing additional coupling means.

[0020] According to an exemplary embodiment, the housing of the at least one (preferably each) aerosol dispenser unit 101, 102, 103 is formed of the same material as the respective coupling element 201, 202, 203/ the respective counter-coupling element 301, 302, 303. According to an exemplary embodiment, the respective coupling element 201, 202, 203/ the respective counter-coupling element 301, 302, 303 are integrally formed with the housing of the at least one (preferably each) aerosol dispenser unit 101, 102, 103. According to an exemplary embodiment, at least one (preferably the whole) side surface of the housing, the respective coupling element 201, 202, 203, and the respective counter-coupling element 301, 302, 303 are formed as one piece thereby providing a compact design.

[0021] According to an exemplary embodiment, the dispenser units 101, 102, 103 have a uniform shape and/or a uniform size. According to an exemplary embodiment, the dispenser units 101, 102, 103 are formed to by symmetric with respect to a longitudinal axis. However, the present invention is not limited to such uniform dispenser units 101, 102, 103 and it is possible to realize other embodiments in which differently sized and/or differently shaped dispenser units are used.

[0022] However, the present invention is not limited to such shapes of the the coupling elements 201, 202, 203

and the counter-coupling elements 301, 302, 303 and it is possible to realize other embodiments in which the coupling elements and the counter-coupling elements have a different shape that allows that at least two of the aerosol dispenser units 101, 102, 103 are fixed in a releasably locked manner by a pair of coupling element and counter-coupling element.

[0023] As depicted in Figure 3, the coupling element 201 of the dispenser unit 101 can be inserted into the counter-coupling element 302 of one of the remaining dispensers 102, 103 and moved by a user in the extension direction until a distance between the spray nozzles of the dispensers 101, 102 is minimized. Thereby dispensers 101, 102 are attached to each other and a common compound dispenser apparatus is realized which allows a user to easily vary the combination of flavors in the aerosol generated by the entirety of the aerosol dispenser units 101, 102, 103 forming the apparatus of the exemplary embodiment of the present invention.

[0024] The dispenser units 101, 102, 103 may contain liquids of a same active ingredient (such as nicotine) with different flavors (such as vanilla and menthol), different active ingredients (such as nicotine and caffeine) with a same flavor (such as vanilla) or different active ingredients (such as nicotine and caffeine) with different flavors (such as vanilla and menthol). Then, by activating one, both or all of the connected and stacked dispenser units 101, 102, 103, the user is able to select and/or combine the different flavors and/or active ingredients.

[0025] However, the present invention is not limited to such a combination of two or three different active ingredients and two or three different flavors and it is possible to realize other embodiments in which more than three different active ingredients and/or more than three different flavors are combined. The exemplary embodiment discloses three stacked dispenser units 101, 102, 103, however, the present invention is not limited to such a combination of three dispenser units and it is possible to realize other embodiments in which two or more than three dispenser units are utilized.

[0026] Hence, a complex compound dispenser apparatus is realized. The modular design allows for attaching an arbitrary number of dispenser units in which each dispenser unit is formed as a self-contained unit allowing users to use each flavor individually if desired. If users want to make use of more than one flavor as contained in one of the separate self-contained units, they can assemble individual units to create a modular structure. This allows users easy access to multiple flavors when on the go.

[0027] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the scope of the appended claims.

LIST OF REFERENCE SIGNS

[0028]

51, 52, 53	spray nozzle
101, 102, 103	aerosol dispenser unit
201, 202, 203	coupling element (protrusion)
301, 302, 303	counter-coupling element (groove)

Claims

1. An apparatus adapted for dispensing an aerosol, the apparatus being configured for enabling a user to selectively add at least one further aerosol to the aerosol.

2. The apparatus of claim 1, comprising a first dispenser unit (101) adapted for dispensing a first aerosol and having a first coupling element (201) configured such that the user is enabled to selectively add a second aerosol to the first aerosol by selectively attaching a second dispenser unit (102).

3. The apparatus of claim 2, wherein the second dispenser unit (102) is adapted for dispensing the second aerosol and the second dispenser unit (102) comprises a counter-coupling element (302) adapted for coupling to the first coupling element (201).

4. The apparatus of claim 2 or 3, wherein the second dispenser unit (102) comprises a second coupling element (202).

5. The apparatus of claim 4, further comprising a third dispenser unit (103) adapted for dispensing a third aerosol, wherein the third dispenser unit (103) comprises a counter-coupling element (303) adapted for coupling to the second coupling element (202) of the second dispenser unit (102).

6. The apparatus of claim 5, wherein the third dispenser unit (103) comprises a third coupling element (203).

7. The apparatus of any of claims 4 to 6, wherein the first dispenser unit (101) comprises a counter-coupling element (301) adapted for coupling to the second coupling element (202) and/or adapted for coupling to the third coupling element (203).

8. The apparatus of any of claims 2 to 7, wherein the first aerosol is different to the second aerosol.

9. The apparatus of any of claims 5 to 8, wherein the second aerosol is different to the third aerosol.

10. The apparatus of any of claims 3 to 9, at least one of the first coupling element (201), the second cou-

pling element (202) and the third coupling element (203) is connected to a corresponding counter-coupling element (301, 302, 303) in a releasably locked manner.

11. The apparatus of any of claims 3 to 10, wherein one of the coupling element (201, 202, 203) and the counter-coupling element (301, 302, 303) comprises a protrusion and the other one of the coupling element (201, 202, 203) and the counter-coupling element (301, 302, 303) comprises a groove.

12. The apparatus of claim 10, wherein the groove (301, 302, 303) forms an elongated slot and the protrusion (201, 202, 203) forms a corresponding key that can be forcibly inserted into the groove (301, 302, 303).

13. The apparatus of claim 10 or 11, wherein a cross-section of the groove (301, 302, 303) and a corresponding cross-section of the protrusion (201, 202, 203) have dovetail-profile or T-profile.

14. The apparatus of any of claims 2 to 13, wherein each dispenser unit (101, 102, 103) comprises a spray nozzle (51, 52, 53), a container adapted for accommodating a liquid, and an activator, wherein each dispenser unit (101, 102, 103) is configured to dispense, upon activation by means of the activator, liquid from the container via the spray nozzle (51, 52, 53) such that the dispensed liquid is transformed into the aerosol by the spray nozzle (51, 52, 53).

15. The apparatus of any of claims 2 to 13, wherein the first to third dispenser units (101, 102, 103) have a uniform shape and/or a uniform size.

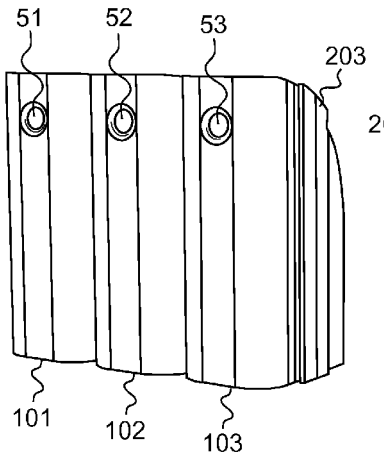

Fig. 1

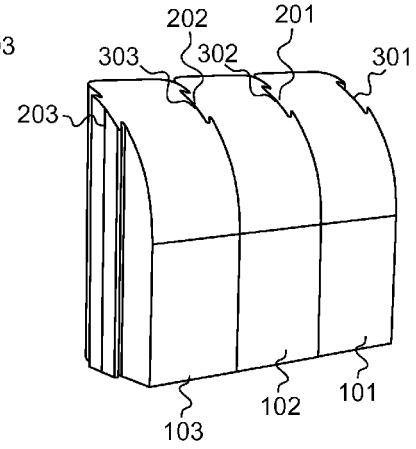

Fig. 2

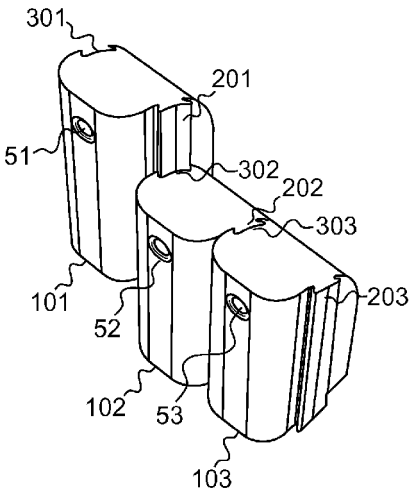

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 4882

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 Y	EP 2 377 778 A1 (OKULLA KAI [DE]) 19 October 2011 (2011-10-19) * abstract; figures 7-13 * * paragraph [0029] - paragraph [0031] * * in combination with D3 or D4 * -----	1-10,14, 15 11-13	INV. B65D83/68 B05B11/00
X Y	US 2003/127354 A1 (CHEN SIN-HSIUNG [TW]) 10 July 2003 (2003-07-10) * abstract; figures 4,5 * * in combination with D3 or D4 * -----	1-10,14, 15 11-13	
Y	US 2005/011853 A1 (BRUGGER GERHARD [AT]) 20 January 2005 (2005-01-20) * abstract; figures 9-14 * * in combination with D1 or D2 * -----	11-13	
Y	US 3 194 426 A (BROWN JR LYNN E) 13 July 1965 (1965-07-13) * abstract; figure 1 * * in combination with D1 or D2 * -----	11-13	

TECHNICAL FIELDS SEARCHED (IPC)

B05B
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 October 2015	Moroncini, Alessio

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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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
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