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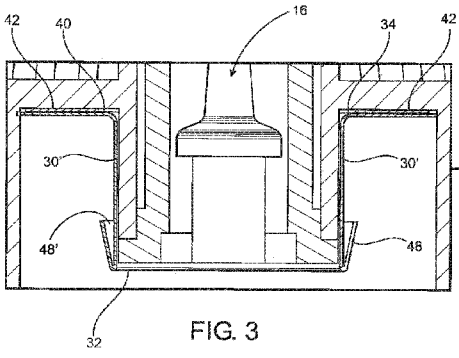


FIG. 3

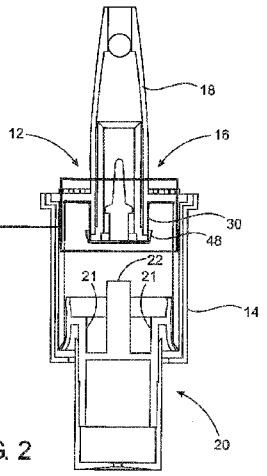


FIG. 2

(57) Abstract: A locking device (10) structured to maintain an activating plunger (20) of a dispenser assembly (12) in an inoperative position, subsequent to dispensing, so as to facilitate a single-use operation thereof and thereby preclude the potential confusion between a used and an unused single-use dispensing device. The locking device includes a body (30) disposed within an open interior or in receiving relation to the plunger as it moves from an operative position to an inoperative position in order to dispense the associated material therefrom. A locking structure (46) is connected to an exterior of the body and is disposed to frictionally engage the plunger in movement restricting relation therewith during the passage of the plunger from the operative position to the inoperative position. The frictional engagement between the locking structure and the plunger is sufficient to prevent or at least restrict movement of the plunger back into the operative position once the material has been dispensed from the dispenser assembly.

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SINGLE USE ENHANCEMENT FOR DISPENSER ASSEMBLY

This invention is directed to a locking device structured for use in combination with a dispenser assembly and including the structural versatility enabling it to be an original part of the dispensing assembly when manufactured and assembled or as an add-on device. In either application, the locking device is structured to assume a movement restricting engagement with an activating plunger of the dispenser assembly thereby assuring that the dispenser assembly will be used and operated as a "single-use" device.

Dispenser assemblies structured to dispense medical or therapeutic compositions into the nasal passages of an individual are common and used extensively for the treatment of nasal and sinus conditions. One typical structure for this type of dispenser is known as a "squeeze" bottle, wherein resilient walls of the dispenser structure are manually compressed, resulting in a mixture of air and intended medication being directed from the discharge nozzle thereof. Typically, a dispenser of this type is intended for repeated use, thereby rendering it difficult to control the amount of composition delivered. In addition, there is a tendency, after discharge, to

release the resilient walls of the squeeze type dispenser which in turn results in an inadvertent withdrawal of fluids from the nasal passage. Such fluids typically will accumulate on the exterior surface of the nozzle. As a result multiple users of the same dispenser assembly are in danger of infection by coming in contact with or inhaling the bodily fluids accumulated from the last user or previous users.

In addition the operation and structure of many dispensers do not provide a meaningful control of the dose or amount of therapeutic composition being dispensed. As a result, the dose regimen for each dispenser cannot be controlled and may result in problems, disadvantages and harm to the user.

Accordingly, single-dose administration devices are sometimes preferred for a variety of reasons including dose precision and prevention of transmission of infection/reduction of risk of contamination. More specifically, depending on the structural and/or operative features of the administration device, it may be obvious that the dose has been dispensed and that it no longer has any medication in it. However, for other designs it may be difficult or indeed impossible to know if the device has been used or not. Such situations may occur if the

administration device does not preclude the operative positioning of an activating member such as, but not limited to, the withdrawal of an activating “plunger” or like component. As a result a discharge device may appear to be identical to a device which has not been discharged. Accordingly, in the latter scenario, a person may not recognize the medication dispenser has been used until after they try to use it. In the case of a medicine that is needed for emergency purposes, this could be extremely dangerous. Therefore, a mechanism that ensures a “used” single-use device could not be “reused” and would therefore not be confused with an “unused” single use device.

Therefore, there is a need in the art relating to dispenser assemblies specifically including, but not limited to, nasal or other dispenser structures intended to deliver a therapeutic or medicinal composition, for an improved dispenser assembly. Such an improved dispenser structure should be operative to overcome problems and disadvantages of the type set forth above. Accordingly one proposed and improved dispenser assembly can be initially structured and/or subsequently modified to operate as a “single-use” dispenser. As such, the operative components of such an improved dispenser assembly would become inoperable at least to the extent of preventing its re-use

thereby limiting the quantity of material that may be dispensed therefrom. As should be apparent, single-use dispensers overcome many of the problems of the type set forth above by allowing only a single dose to be dispensed. In addition due to the fact that a dispenser assembly cannot be re-used, the chances of infections being transferred from one individual to another is eliminated or significantly reduced.

Moreover, a single-use structuring of a dispenser assembly may involve the inclusion of an improved locking device. Further, the structural and operative features of such an improved locking device facilitates its use as an original component of a dispenser assembly as manufactured and assembled (OEM) or alternatively serve as an “add-on” component to a dispenser assembly which has already been designed and manufactured. Structural and operative features of such a proposed and improved locking device would enable the normal operation of other components of the dispenser assembly such as, but not limited to, an activating plunger movable into a dispensed orientation to facilitate the dispensing of a single dose material from the dispenser assembly. However, the proposed and improved locking device would also serve to interact with the plunger assembly or other operative components of the

dispenser assembly to prevent a re-use thereof and/or more than one, predetermined doses being dispensed therefrom.

Finally an improved and proposed locking device of the type needed to overcome the problems and disadvantages as set forth above would be of simple structure and design and would significamtly reduce the cost thereof thereby facilitating its use in a single-use dispenser assembly which may thereafter be discarded.

The present invention is directed to a locking device which is structured to be used in combination with a dispenser assembly, either as part of its original manufactured components (OEM) or as an “add-on” included after the other components of the dispensed assembly have been designed and manufactured. In either application, the locking device of the present invention renders the dispenser assembly a “single-use” device by preventing or at least restricting an activating plunger of the dispenser assembly from being disposed back into an operative or “ready” position from an inoperative or dispensed position, once a single dispensing cycle has occurred.

Accordingly, the dispenser assembly, as described and represented herein may be considered only representative of other dispenser assemblies having different structural and operative features. As such, the representative dispenser

assembly referred to herein includes a housing, a dispensing portion, an activating plunger, and a supply of material and/or composition intended to be dispensed.

More specifically, the locking device of the present invention comprises a body dimensioned and configured to be disposed on an interior of the housing of the dispensing assembly in an accessible, engaging relation to the plunger, as the plunger moves from the aforementioned operative or "ready" position into the inoperative or "dispensed" position. In at least one preferred embodiment, the body includes an open and/or hollow interior having oppositely disposed open ends. Further, the body includes a substantially cylindrically configured outer wall disposed in surrounding relation to the open interior and at least partially defining the boundaries thereof. The inner or proximal open end of the body includes a head portion extending transversely outward, about the periphery thereof and includes an outer exposed surface. Fixed positioning and secure mounting of the body within the interior of the housing of the dispenser assembly is facilitated through the provision of a connector disposed in securing position between the outer or exposed surface of the head of the body and correspondingly disposed interior surface portions of the housing dispenser. In at least one embodiment a

connector may be at least partially formed of an adhesive material thereby serving to adhesively secure the body of the locking device in its intended position.

In addition, the body includes a locking structure formed thereon. In at least one preferred embodiment the cylindrical outer wall of the body includes a locking flange connected to the exterior outer wall and extending outwardly therefrom preferably, but not necessarily at an upwardly directed angular orientation. The dimension and configuration of the locking flange will be such as to purposefully interfere with passage and movement of the plunger by sliding but frictionally engaging corresponding portions of the activating plunger as it is selectively forced from the operative, ready position into the inoperative, dispensed position. Once disposed in the dispensed or inoperative position, the frictional engagement between the locking flange of the locking structure and corresponding surface portions of the activating plunger will define a movement restricting engagement therebetween. As a result, activating plunger will be prevented from moving back into the operative or ready-to-use position after a single dispensing cycle of the dispenser assembly has occurred. As should be evident, maintaining the activating plunger in the inoperative or

dispensed position prevents its re-use.

Other structural and operative features of the locking device of the present invention may include the locking flange of the locking structure being at least partially flexible, being formed of a relatively flexible material and/or having at least a minimal amount of flexibility due to its interconnection with the outer wall of the body. As such passage of the activating plunger into the dispensed or inoperative position will force corresponding interior surfaces of the activating plunger into a sliding, frictional engagement with the outwardly extending locking flange of the locking structure. When such engagement occurs, the locking flange may be flexed inwardly towards the outer wall of the body to which it is attached.

As a result the frictional engagement between the locking flange and the corresponding surface of the plunger will be enhanced and maintained in that the flexible characteristics of the locking flange will tend to bias it outwardly into the aforementioned frictional, movement restricting engagement. As a result, the movement of the plunger back into the operative or ready position will be restricted or prevented, thereby making the dispenser assembly a “single-use” device. As set forth above, the locking device demonstrates sufficient structural

versatility to be considered an original component of the dispenser assembly as it is manufactured and assembled. In contrast, the locking structure may be an add-on device so as to assure that the dispenser assembly operates as a single use dispenser.

Moreover, the dispenser assembly itself may be structured to dispense a variety of different materials and/or be specifically customized or structured as to serve as a single purpose dispenser such as nasal dispenser. In such a latter application, the dispensing portion of the dispenser assembly may be at least partially dimensioned or configured to facilitate specified dispensing procedures, such as including a dispensing nozzle. In addition, the locking device of the present invention is operatively structured with both the dispensing portion of the dispenser assembly as well as the plunger so as to not interfere with movement or positioning of the plunger into operative relation with the dispensing portion and supply of material to be dispensed. Therefore, the open interior configuration of the body as well as the oppositely disposed open ends thereof are disposed and dimensioned to facilitate the normal or intended operation of the plunger as it interacts with the dispensing portion of the dispenser assembly when the plunger is forced from the

ready or operative position to the dispensed or inoperative position. However, the aforementioned locking structure at least partially defined by the locking flange will prevent return movement of the plunger from the inoperative, dispensed position back into the operative, ready position.

These and other objects, features and advantages of the present invention will become clearer when the drawings as well as the detailed description are taken into consideration.

For a fuller understanding of the nature of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view of a connector used to connect the locking device of the embodiment of Figure 1A within the interior of the dispensed assembly.

Figure 1A is a perspective view of a locking device to be operatively positioned within the interior of a dispenser assembly thereby facilitating its use as a single-use dispenser.

Figure 2 is a longitudinal sectional view showing interior portions of an example of a dispenser assembly with which the locking device of the embodiment of Figure 1 may be used.

Figure 3 is a detailed view in partial cutaway of the indicated portion of Figure 2.

Figure 4 is an interior sectional view in the partial cutaway of the embodiments of Figures 1-3 in an operative position.

Figure 5 is an interior sectional view in partial cutaway of the embodiment of Figure 4 in an at least partially dispensed position.

Figure 6 is an interior sectional view of the embodiment of Figures 1-5 in a non-operative position upon completion of the dispensing of the material from the dispensing assembly.

Figure 7 is a detailed view of the indicated portion of Figure 6.

Like reference numerals refer to like parts throughout the several views of the drawings.

As represented in the accompanying drawings, the present invention is directed to a locking device generally indicated as 10 structured to be used in combination with a dispenser assembly of the type represented in Figure 2 and generally represented as 12. It is emphasized that the dispenser assembly 12 is represented in example form only in that structural features of a different dispenser

assembly (not shown) may vary from the dispenser assembly 12 and still be operative when used in combination with the locking device 10.

Accordingly the dispenser assembly 12 includes a housing 14 and a dispensing portion generally indicated as 16 connected thereto or otherwise associated therewith. The dispensing portion 16 is operatively associated with a material or composition (not shown) intended to be dispensed. The dispenser assembly 12 also includes a delivery portion 18 which may be in the form of a nozzle or like structure such as, but not limited to, the type intended to deliver medicinal or therapeutic material to nasal passages of an individual. The delivery portion or nozzle 18 may be appropriately shaped for at least minimal insertion into the nostril and/or nasal passages of the individuals, but is not limited to such a use or application. Additional operative features of the dispenser assembly 12 include a plunger generally indicated as 20, which serves to engage and activate the dispensing portion 16 as it moves from an operative or “ready” position of Figure 2 into a “dispensed” or inoperative position as represented in Figure 6.

Dependent upon the specific cooperative structuring of the various components of the dispenser assembly 12, the

plunger in the embodiment represented in Figure 2 has an activating member 22 disposable into activating and/or operative engagement with a portion of a dispensing assembly 16 so as to cause the dispensing of the intended material from the dispensing portion 16 and delivery portion or nozzle 18. Accordingly, the activating member or portion 22 moves with the plunger 20 as it is forced within the interior of the housing 14, such that the activating member or portion 22 engages the dispensing portion 16 in an intended manner. Therefore and as indicated above, in the operative or ready position of Figure 2 the plunger extends outwardly from the housing 14 in a “non-activating” engagement or relation to the dispensing portion 16. In contrast, the activating member 22 associated with the plunger 20 moves into activating engagement with the dispensing portion 16 as the plunger 20 progressively passes through the interior of the housing 14 in the manner represented in Figures 5 and 6.

With primary reference to Figure 1A, the locking device 10 includes a body 30 preferably comprising a substantially cylindrical outer wall configuration and an open interior including oppositely disposed open ends 32 and 34. The body 30 also includes a head portion generally indicated as 36 comprising a connecting flange 38 having an

outer exposed surface 38' which is dimensioned and configured to facilitate secure connection or mounting of the locking device 10 within the interior of the housing 14 of the dispenser assembly 12. As represented, the connecting flange 38 extends transversely outward from the body 30 in at least partially surrounding relation to the open end 34 and/or the periphery thereof.

As further represented in Figure 1, a connector generally indicated as 40 is dimensioned and configured to be at least partially mounted on the outer surface 38' of the connecting flange 38. When so positioned, the connecting flange 38 serves to interconnect the body 30 to correspondingly disposed interior portions, as at 42, of the housing 14. In more specific terms, at least one embodiment of the connector 40 may include a substantially annular configuration at least partially corresponding to the annular configuration of the connecting flange 38 and outer exposed surface 38'. Further, the connector 40 may be at least partially formed from an adhesive material or have adhesive characteristics sufficient to adhesively interconnect the mounting flange 38 and accordingly the remainder of the body 30 to interior surface portions or other corresponding portions 42 within the housing 14.

Therefore, it is emphasized that the locking device 10

may be operatively mounted and/or connected within the interior of the housing 14 and as such may be an original component of the dispenser assembly 12 as it is initially manufactured, produced and/or assembled. In contrast, the structural versatility of the locking device 10 enables it to be added to a dispenser assembly 12, of the type represented in Figure 2, as an “add-on” component. In either application, the locking device 10 is structured to facilitate the original manufacture or the conversion of a dispenser assembly 12 to a “single-use” dispenser. In doing so, many of the disadvantages and problems recognized in the structural and operative features of known devices of this type are overcome. As set forth herein such problems include, but are not limited to, the monitoring or regulating of the individual dose of material being dispensed from the dispenser assembly 12.

Accordingly, the structural and operative features of the locking device 10 which enables the operation and use of a dispenser assembly 12 as a “single-use” dispenser includes the provision of a locking structure generally indicated as 46. More specifically, the locking structure 46 preferably comprises a locking structure 46 in the form of locking flange 48. The locking structure and locking flange 48 is connected exteriorly of the body 30 to the

outer cylindrical wall 30' preferably, but not necessarily, adjacent or contiguous to a corresponding end 32. In addition, the locking flange 48, due at least in part to the material from which it is formed or alternatively due to its connection to the body 30, is at least partially flexible and/or demonstrates flexible characteristics. Moreover, the maintenance of the plunger 20 in the non-operative and/or dispensed position renders the dispenser assembly 12 a single-use device. This is accomplished by the locking flange 48 frictionally engaging and possibly at least minimally penetrating corresponding interior surfaces as at 21' as clearly represented in Figures 6 and 7.

Therefore, as the plunger 20 is pushed inwardly into the interior of the housing 14, the activating member 22 will operatively engage the dispensing portion 16 causing the dispensing of the intended material from the delivery portion or nozzle 18, as intended. However, the forced inward travel of the plunger 20 will also result in the interior surface portions 21 passing into sliding, frictional engagement with the locking flange 48 defining the locking structure 46. Therefore, as represented in Figures 6 and 7, at least the outer free end or periphery 48' of the locking flange 48 will slidingly engage the correspondingly disposed interior surfaces 21 of the

plunger 20 resulting in a frictional engagement therebetween. Further, when such frictional engagement occurs the locking flange 48 may be forced or "biased" inwardly towards the outer cylindrical wall 30'. Due to the flexible characteristics of the locking flange 48 as well as the material from which it is formed, the locking flange 48 will be normally biased outwardly into the orientation or position represented in Figure 2, when the locking flange 48 is not engaged by the plunger 20, as at plunger portion or surface 21. However, once frictional engagement occurs between the interior surfaces 21 and the plunger 20 the locking flange 48, the locking flange 48 will be at least partially biased inwardly towards the outer cylindrical wall 30'. This biased, frictional engagement may result in at least minimal embedding, scraping, penetrating, etc. of the outer free periphery 48' into the interior surfaces 21, as at 21', of the plunger 20 as at least partially represented in Figures 6 and 7.

As a result the plunger 20 will be maintained into a movement restricting engagement with the locking flange 48 of the locking structure 46 and/or the outer free peripheral end 48'. The plunger 20 will thereby be prevented from being returned to the operative or ready position as represented in Figures 2 and 4. The provision

of the locking device 10 and its interactive movement restricting engagement with the interior surfaces 21 of the plunger 20 will thereby render the dispenser assembly 12, with which the locking device 10 is used, as a “single-use” dispenser, as set forth above.

Further structural features of the locking device 10 include the open interior of the body 10 and the direct communication of the open ends 32 and 34 therewith. As a result, the locking device 10, including the body 30 can be said to be operatively mounted in at least partially surrounding relation to the dispensing portion 16 of the dispenser assembly 12 as clearly represented throughout the Figures. Further the opened distal end 32 of the body 30 allows passage of the activating member 22 of the plunger 20 into activating or operative engagement with the dispensing portion 16 of the dispenser assembly 12 as clearly represented in Figures 5 through 7. Therefore, the open interior of the body 30 of the locking device 10 can be said to be in receiving relation to the plunger 20 or at least the activating portion 22 thereof when the plunger 20 is forced into the dispensed position as clearly represented in Figure 6. When the activating portion 22 of the plunger 20 is in the aforementioned dispensed position the body 30 and the outer cylindrical wall 30’ can also be

said to be in at least partially surrounding relation with both the dispensing portion 16 as well as the activating portion 22 of the plunger 20.

Since many modifications, variations and changes in detail can be made to the described preferred embodiment of the invention, it is intended that all matters in the foregoing description and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents.

Claims:

1. A dispenser assembly (12) structured for a single-use application, said dispenser assembly (12) comprising:

a housing (14) including a dispensing portion (16) disposed and structured to deliver material from said housing,

a plunger (20) movably connected to said housing and disposable thereon between an operative position and inoperative position,

a locking device (10) disposed within said housing and structured to facilitate passage of said plunger from said operative position into said inoperative position, and

said locking device (10) including a locking structure (46) disposed and configured for movement restricting engagement with said plunger when said plunger is in said inoperative position.

2. A dispenser assembly as recited in claim 1, wherein said movement restricting engagement comprises a frictional engagement of said locking structure with said plunger.

3. A dispenser assembly as recited in claim 2, wherein said movement restricting engagement further comprises a movable sliding engagement between said locking structure and said plunger.

4. A dispenser assembly as recited in any preceding claim, wherein said locking device (10) is connected within said housing (14) and includes an open interior, said open interior disposed in receiving relation to said plunger (20) when in said inoperative position.

5. A dispenser assembly as recited in claim 4, wherein said locking structure (46) is disposed exteriorly of said open interior in sliding, frictional engagement with said plunger (20).

6. A dispenser assembly as recited in claim 4 or claim 5, wherein said locking structure (46) comprises a flange (48) connected to an exterior of said locking device (10) and extending outwardly therefrom, said flange at least partially formed of a flexible material, said movement restricting engagement comprises said flange disposed in biased engagement with said plunger (20).

7. A dispenser assembly as recited in any one of claims 1 to 6, wherein said open interior is disposed in at least partially surrounding relation to said dispensing portion and said plunger (20) when said plunger is in said inoperative position.

8. A dispenser assembly as recited in any preceding claim, wherein said locking device (10) comprises a body (30) including an open at least partially hollow interior

disposed in receiving relation to said plunger (20) when in said inoperative position.

9. A dispenser assembly as recited in claim 8, wherein said locking structure (46) is connected to an exterior of said body (30) and extends outwardly therefrom into said movement restricting engagement with said plunger (20) when in said inoperative position.

10. A dispenser assembly as recited in claim 9, wherein said body (30) comprises a substantially cylindrical outer wall (30') configuration; said locking structure (46) comprising a flange (48) connected to an exterior of said outer wall and extending outwardly therefrom.

11. A dispenser assembly as recited in claim 10, wherein said flange (48) is at least partially formed from a flexible material and comprises an at least partially annular configuration connected to and extending outwardly from an exterior of said outer wall and in at least partially surrounding relation thereto.

12. A dispenser assembly as recited in any one of claims 8 to 11, further comprising a connector (40) disposed in interconnecting relation between said body and interior of said housing.

13. A dispenser assembly as recited in claim 12, wherein said body (30) comprises a head portion (36); said

connector (40) disposed in interconnecting relation between said head portion and an interior portion of said housing.

14. A dispenser assembly as recited in claim 13, wherein said connector (40) is at least partially formed of an adhesive material disposed to adhesively secure said body to said housing.

15. A dispenser assembly as recited in claim 13 or claim 14, wherein said head portion (36) is disposed transversely outward in at least partially surrounding relation to an open end of said body, said head portion (36) including an outer exposed surface (38'), said connector mounted on said exposed surface in attached engagement with an interior of said housing.

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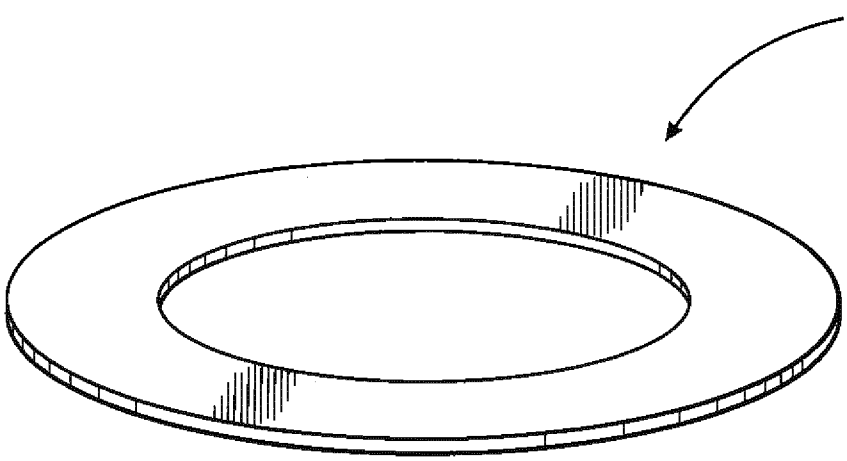


FIG. 1

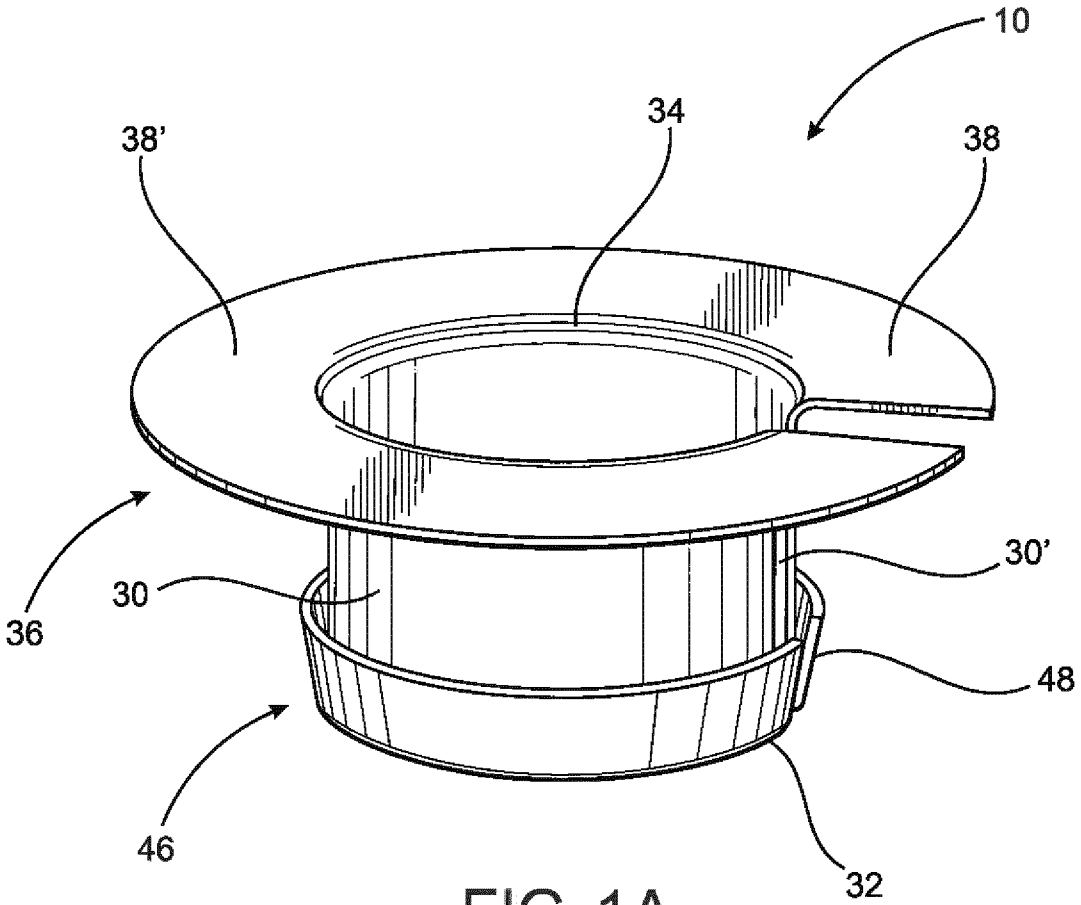


FIG. 1A

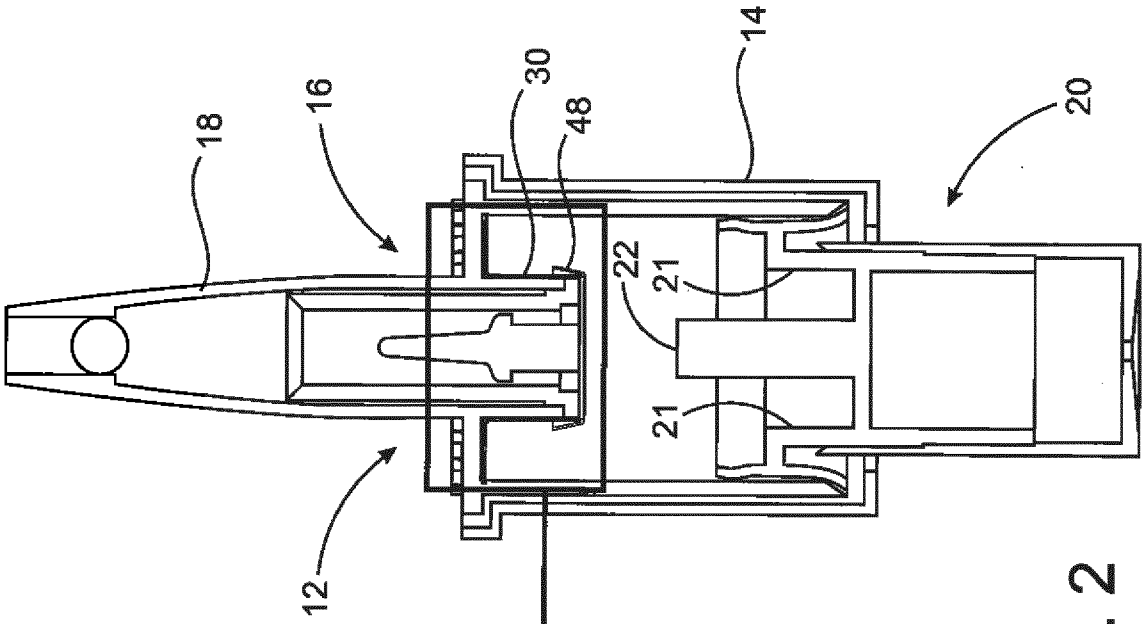


FIG. 2

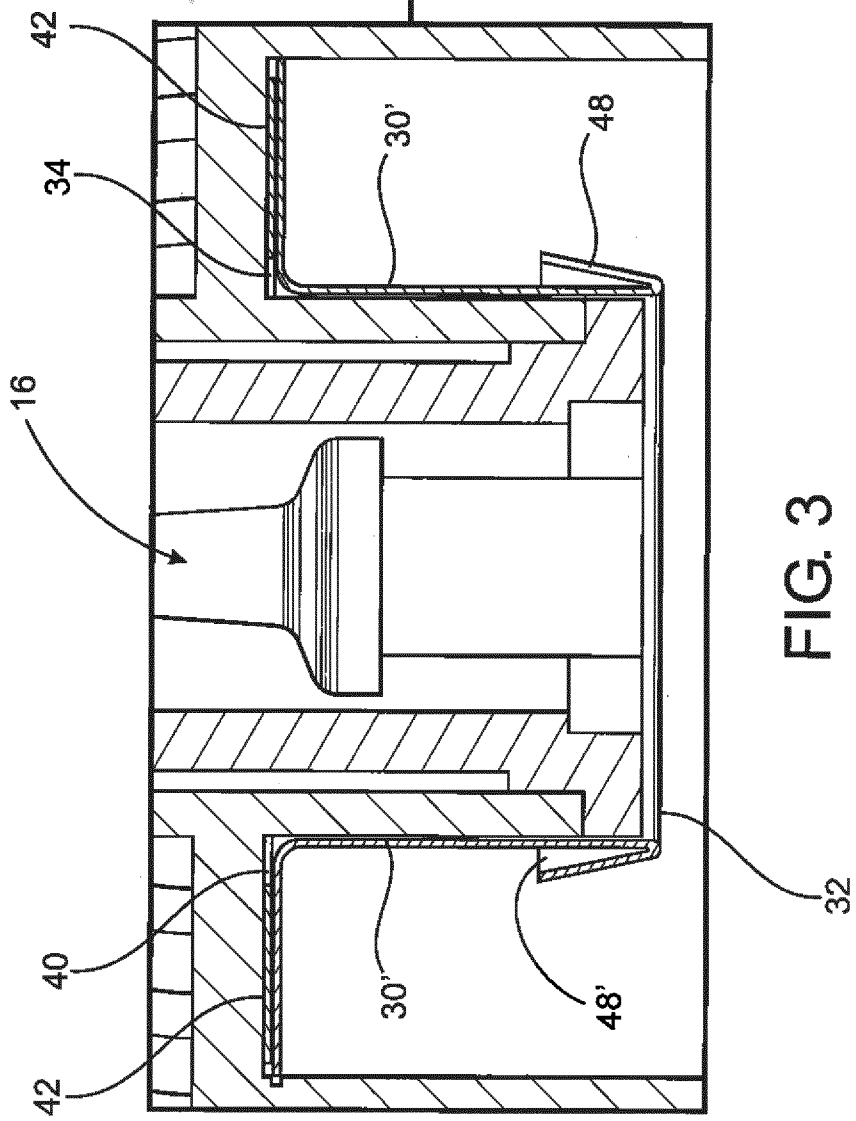


FIG. 3

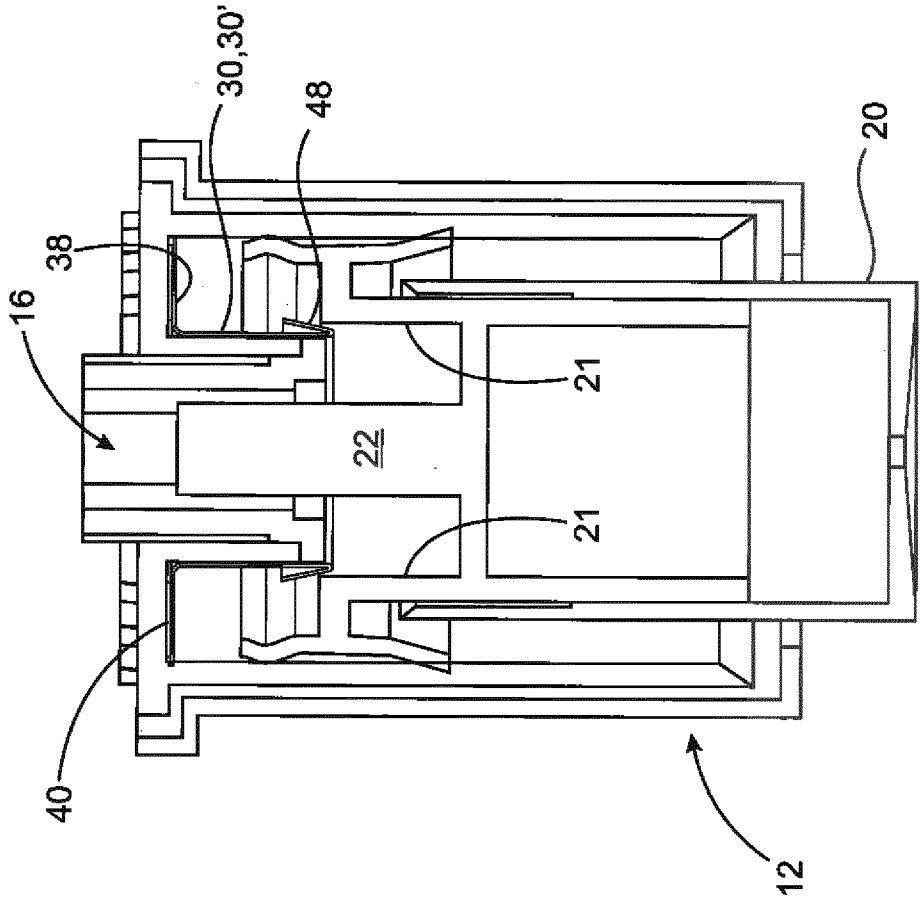


FIG. 5

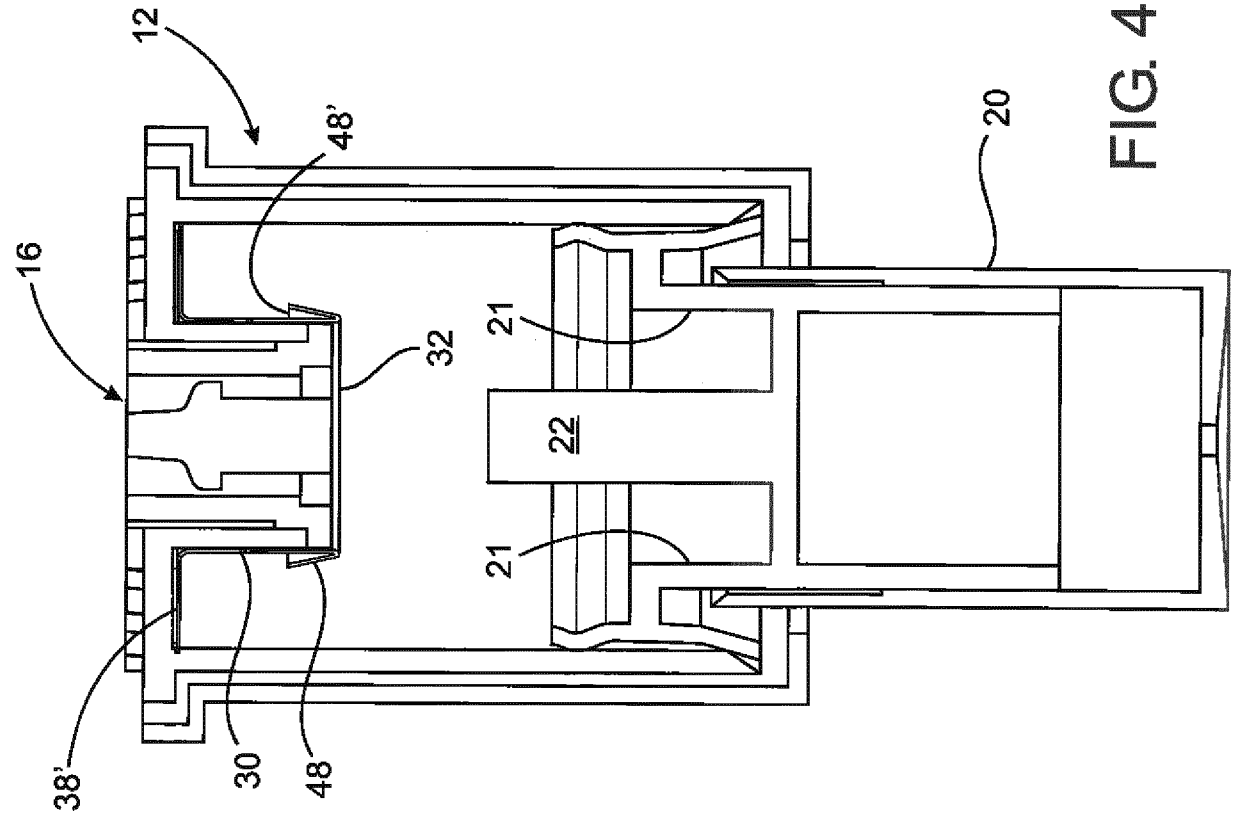


FIG. 4

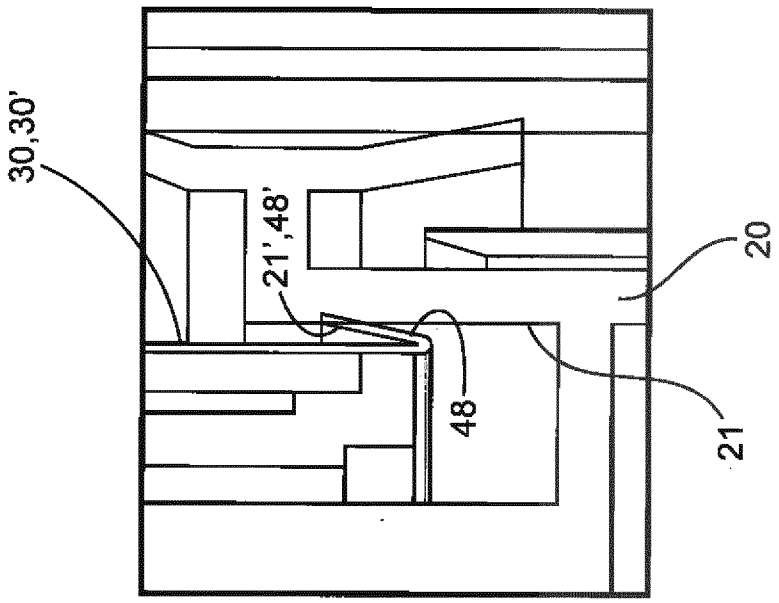


FIG. 7

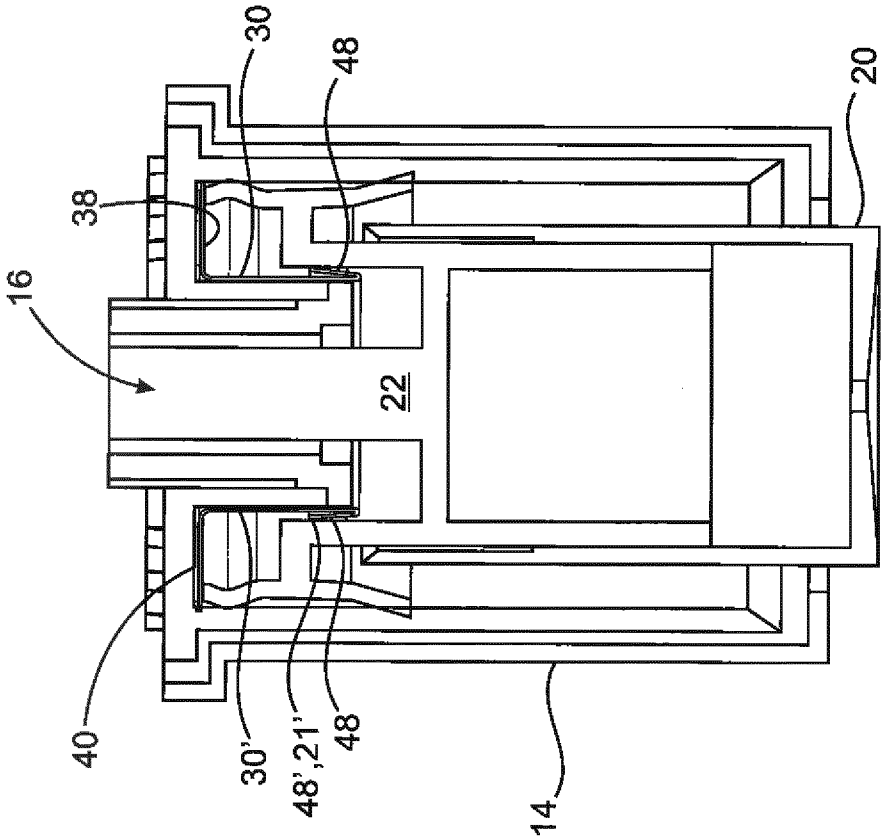


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/066925

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M15/00 A61M11/00
ADD. A61M15/08

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)
A61M

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.
X	US 2010/095957 A1 (CORBACHO HIPOLITO P [US]) 22 April 2010 (2010-04-22)	1-13,15
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Y	page 1, line 3 - page 2, line 3 page 2, line 26 - page 5, line 3 page 5, line 25 - page 7, line 31 figures 1, 2	1-15

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
19 November 2014	05/12/2014

Name and mailing address of the ISA/	Authorized officer
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Y	paragraph [0001] - paragraph [0013] paragraph [0031] - paragraph [0048] paragraph [0060] - paragraph [0084] paragraph [0089] - paragraph [0105] figures 3-9	1-15

Y	CA 2 020 425 A1 (BRUNET MICHEL [FR]; JOUILLAT CLAUDE [FR]) 5 January 1991 (1991-01-05) page 1, line 2 - line 26 page 7, line 9 - page 8, line 12 figures 4, 4a	1-15

Y	WO 2007/022898 A2 (BOEHRINGER INGELHEIM INT [DE]; GESER JOHANNES [DE]; METZGER BURKHARD P) 1 March 2007 (2007-03-01) page 1, line 3 - page 5, line 5 page 10, line 22 - page 12, line 26 figure 3	12-15

Y	WO 2008/103175 A1 (M2 MEDICAL AS [DK]; CAUSEY JAMES [US]; KIRSCHEN TODD [US]; WENGER MITC) 28 August 2008 (2008-08-28) page 1, line 2 - line 3 page 22, line 26 - page 23, line 29 figures 8A, 8B	14

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