



(22) Date de dépôt/Filing Date: 2004/02/10  
(41) Mise à la disp. pub./Open to Public Insp.: 2004/10/09  
(45) Date de délivrance/Issue Date: 2007/03/13  
(30) Priorité/Priority: 2003/04/09 (DE103 16 127.9-44)

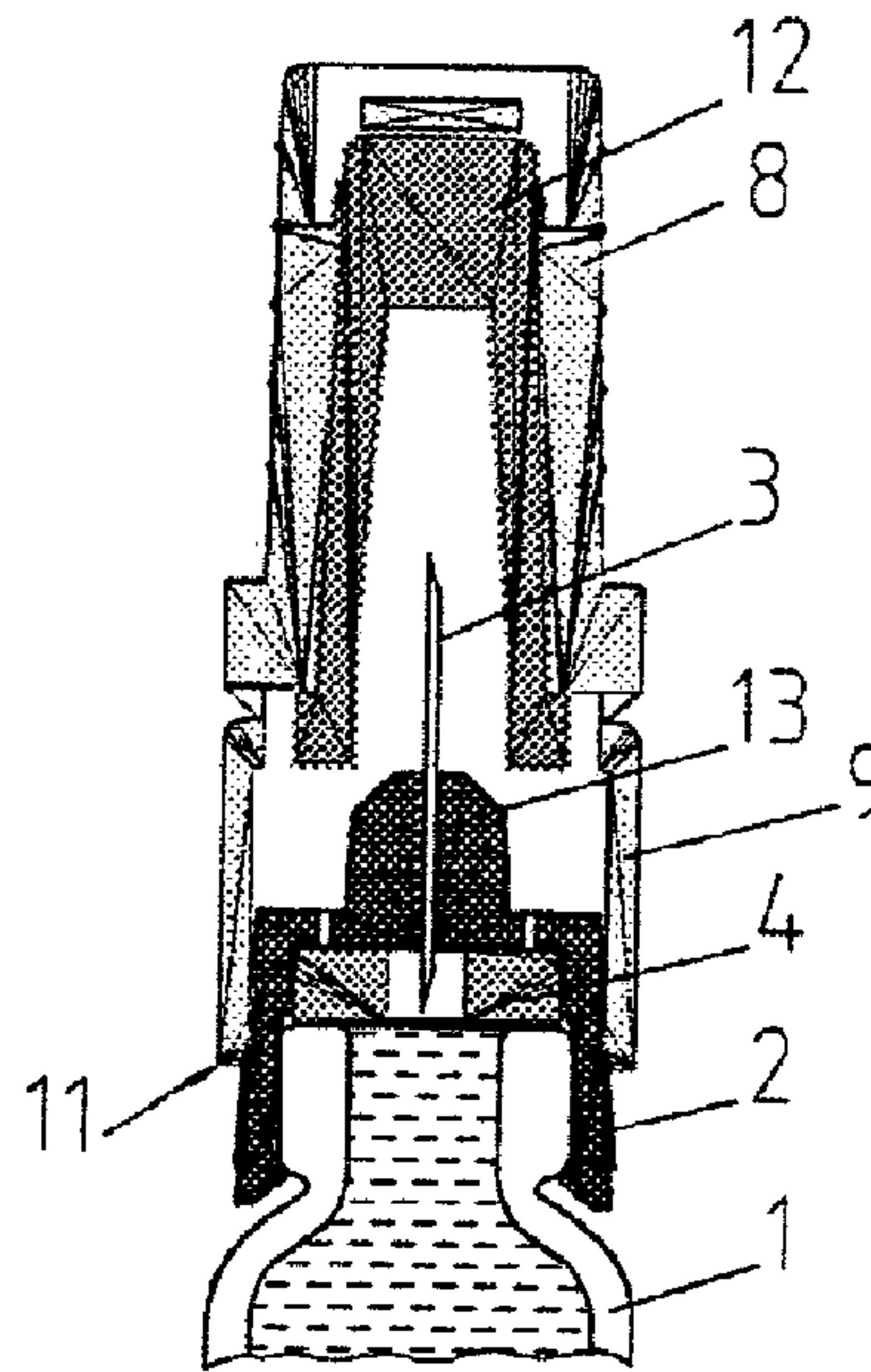
(51) Cl.Int./Int.Cl. *A61M 5/178* (2006.01),  
*A61M 5/20* (2006.01), *A61M 5/28* (2006.01),  
*A61M 5/31* (2006.01)

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(54) Titre : SERINGUE A CARTOUCHE OU CARPULE PREREMPLIE A USAGE MEDICAL  
(54) Title: PREFILLED SYRINGE OR CARPULE FOR MEDICINAL PURPOSES



(57) **Abrégé/Abstract:**

A prefilled syringe or carpule is provided for medical purposes, having a glass syringe barrel and inside it a syringe plunger which can be displaced by means of a plunger rod. A cannula cap, in which a cannula is fixedly inserted and held axially in a detent position, is mounted on the cannula end of the syringe barrel. Further provided is a sealing disk inserted in the cannula cap and arranged coaxially to the cannula cap. One side of the disk lies flush against the end face of the syringe barrel and the other side lies flush against the internal face of the cannula cap and the disk centrally displays a recess in the form of a blind hole, whose base forms a membrane. The end of the cannula closest to the syringe barrel projects clear through the internal face of the cannula cap into the recess of the sealing disk. Finally, the syringe possesses a sealing component consisting of a sealing cap and a locking ring joined to it by means of a predetermined breaking point, which can be moved from a first detent position formed for the locking ring in the external surface of the shell of the cannula cap, thus making possible the sterilization of the interior space of the sealing component, to a locking position enclosing and sterilely sealing off the cannula cap.



Abstract

A prefilled syringe or carpule is provided for medical purposes, having a glass syringe barrel and inside it a syringe plunger which can be displaced by means of a plunger rod. A cannula cap, in which a cannula is fixedly inserted and held axially in a detent position, is mounted on the cannula end of the syringe barrel. Further provided is a sealing disk inserted in the cannula cap and arranged coaxially to the cannula cap. One side of the disk lies flush against the end face of the syringe barrel and the other side lies flush against the internal face of the cannula cap and the disk centrally displays a recess in the form of a blind hole, whose base forms a membrane. The end of the cannula closest to the syringe barrel projects clear through the internal face of the cannula cap into the recess of the sealing disk. Finally, the syringe possesses a sealing component consisting of a sealing cap and a locking ring joined to it by means of a predetermined breaking point, which can be moved from a first detent position formed for the locking ring in the external surface of the shell of the cannula cap, thus making possible the sterilization of the interior space of the sealing component, to a locking position enclosing and sterilely sealing off the cannula cap.

## PREFILLED SYRINGE OR CARPULE FOR MEDICINAL PURPOSES

Field of the Invention

The present invention refers to a prefilled syringe or  
carpule for medicinal purposes, having a glass syringe  
5 barrel and, located within it, an injection plunger that  
can be displaced by means of a plunger rod. The invention  
further relates to a procedure for packaging such a  
syringe.

Background of the Invention

10 Syringes of this type are known in many embodiments, with  
their configurations frequently depending on the way the  
cleaning, filling and packaging processes are performed.  
In this regard, high-temperature processes pose a special  
problem, and most particularly so when the ready-made  
15 syringe must come equipped with a fixedly inserted cannula.

It is therefore desirable to create a syringe of the type  
described above that provides flexibility in the way that  
these process can be performed, and at the same time can be  
packaged in a simple and thus cost-effective manner.

20 Summary of the Invention

The present invention provides a prefilled syringe or  
carpule for medical purposes, comprising:

- (a) a glass syringe barrel;
- (b) a syringe plunger located in the barrel, which can be  
25 actuated by means of a plunger rod;
- (c) a cannula cap axially mounted on a cannula end of the  
syringe barrel and held in a first detent;

- (d) a cannula fixedly inserted and extending through the cannula cap;
- (e) a sealing disk inserted in the cannula cap and located coaxially with the cannula cap, having a first face lies flush against the cannula end of the syringe barrel and having a second face that lies flush against an internal face of the cannula cap;
- (f) a central recess shaped as a blind hole, formed in the sealing disk, wherein a base of the recess forms a membrane, wherein an end of the cannula closest to the syringe barrel projects into the recess of the sealing disk; and
- (g) a sealing component defining an internal space consisting of a sealing cap and a locking ring joined to the sealing cap by means of a predetermined breaking point, wherein the locking ring moves from a detent position formed in an external shell of the cannula cap, to facilitate sterilization of the internal space, to a locking position sterilely enclosing and sealing off the cannula cap.

The present invention allows that the glass syringe barrel can be subjected to high temperature processes before filling, and more particularly to heat-curing siliconization, without problems arising in the process, as is the case when cannulae are cemented into the glass body. Moreover, the cannula, when in storage, is protected not only against external impacts, but also protected by the sealing disk from contact with the pharmaceutical solution. The possibility also exists of bubble-free filling of the syringe barrel or carpule, which simplifies manipulation before use. Further still, a self-activation takes place at the time of use, since the membrane formed in the

locking disk is penetrated by the point of the cannula facing towards it under the pressure of the plunger rod, transmitted to it by the fluid.

To obtain an additional protection, more particularly of the cannula, a preferred feature of the invention is to provide a needle protective cap located in the interior of the sealing component. This needle protective cap is preferably made of rubber.

It is further proposed according to the invention that the cannula cap display a cylindrical projection surrounding the cannula, and which, in the locking position of the sealing component, tightly abuts against the internal surface of the shell of the needle protective cap.

According to another aspect of the present invention, following the cleaning of the glass syringe barrel, a heat-curing siliconization is performed so that the cannula cap with the sealing disk located in it and the sealing component situated in the detent position impinges on the syringe barrel and the syringe or carpule is then sterilized, the syringe barrel is then filled and finally the sealing component is pressed down into the locking position.

In this way, the syringe barrel can be filled without bubbles, so that after the cannula cap is mounted, no air inclusions are present in the syringe barrel, owing to the sealing disk lying flush against the end face of the syringe barrel.

Brief Description of the Drawings

The present invention is more fully explained with reference to the following drawings:

5 Fig. 1 is an exploded, cross-sectional view of the cannula cap with the sealing disk, and the sealing component;

Fig. 2 is a cross-sectional view of the present invention, before being mounted on the syringe in a pre-packaging stage;

10 Fig. 3 is a cross-sectional view of the present invention, mounted on the syringe;

Fig. 4 is a cross-sectional view of the present invention, as completely packaged; and

Fig. 5 is a cross-sectional view of the present invention, as prepared for application.

15 Detailed Description

The syringe or carpule, only partly shown in Figures 2 to 5, is provided for medical purposes and consists of a glass syringe barrel 1 and a syringe plunger (not shown) which can be displaced by means of a plunger rod (also not shown). This syringe is made to be sold in prefilled condition and as far as possible ready for immediate application.

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As seen in Figures 2 and 3, a cannula cap 2 is axially mounted on the cannula end of the syringe barrel 1 and held there in a detent position. A cannula 3 is fixedly inserted in the cannula cap 2.

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Also provided is a sealing disk 4 fitted coaxially in the cannula cap 2 and with one face flush against the end face of the syringe barrel 1 and the other flush against the internal face of the cannula cap 2. This sealing disk 4 has a central recess 5 in the form of a blind hole, with a base of the recess 5 forming a thin membrane.

An end of the cannula 3 closest to the syringe barrel 1 projects past the internal face of the cannula cap 2 into the recess 5 of the sealing disk 4, so that under the pressure of the syringe plunger, which is transmitted onto the membrane by the fluid, the membrane is pushed against the inner tip 6 of the cannula 3 and thus pierced or destroyed. In this way, the syringe is ready for use in a self-activating manner.

As seen in Figure 1, also provided is a sealing component 7 protecting the cannula 3, consisting of a sealing cap 8 and a locking ring 9. The sealing cap 8 is joined to the locking ring 9 by means of a predetermined break point 10. This predetermined break point 10 simplifies detaching the sealing cap 8 before using the syringe.

A detent position 11 is provided on the external shell of the cannula cap 2 for engagement with the locking ring 9, to place the locking ring 9 in a detent position to allow communication between the internal space of the sealing component 7 and the external environment, so that the inner space can be sterilized. This detent position 11 is shown in Figures 2 and 3. When sterilization is completed, the sealing component 7 - still under sterile conditions - can be shifted to the locking position shown in Figure 4, by

simply pressing on it, which thus produces a sterile seal against the cannula cap 2.

As well, a rubber needle protective cap 12 is located in the interior of the sealing cap 7.

- 5 The cannula cap 2 has a cylindrical projection 13 surrounding the cannula 3 which, in the locking position of the sealing component 7, lies flush against the internal surface of the needle protective cap 12, forming a seal.

10 This embodiment simplifies the preparation of a syringe for use, since for its application only the sealing cap 8 has to be detached. More particularly, the syringe is already fitted with the cannula 3 without having to accept restrictions in the flow of the process. The syringe barrel 1 can more particularly also be subjected to high-  
15 temperature processes, such as for instance heat-curing siliconization, without the seating or purchase of the cannula being affected. Further, the arrangement permits bubble-free filling of the syringe barrel 1 with a pharmaceutical substance.

Claims:

1. A prefilled syringe or carpule for medical purposes, comprising:
  - (a) a glass syringe barrel;
  - 5 (b) a syringe plunger located in the barrel, which can be actuated by means of a plunger rod;
  - (c) a cannula cap axially mounted on a cannula end of the syringe barrel and held in a detent;
  - (d) a cannula fixedly inserted in and extending through  
10 the cannula cap;
  - (e) a sealing disk inserted in the cannula cap and located coaxially with the cannula cap, having a first face lies flush against the cannula end of the syringe barrel and having a second face that lies flush  
15 against an internal face of the cannula cap;
  - (f) a central recess, shaped as a blind hole, formed in the sealing disk, wherein a base of the recess forms a membrane; wherein an end of the cannula closest to the syringe barrel projects into the recess of the sealing  
20 disk; and
  - (g) a sealing component defining an internal space and consisting of a sealing cap and a locking ring joined to the sealing cap by means of a predetermined breaking point, wherein the locking ring moves from a  
25 detent position formed in an external shell of the cannula cap to facilitate sterilization of the internal space, to a locking position sterilely enclosing and sealing off the cannula cap.
2. A syringe or carpule according to claim 1, further  
30 comprising a needle protective cap located in the interior space of the sealing component.

3. A syringe or carpule according to claim 2,  
characterized in that the needle protective cap is  
made of rubber.
4. A syringe or carpule according to claim 2 or 3,  
5 characterized in that the cannula cap displays a  
cylindrical projection enclosing the cannula, which,  
in the locking position of the sealing component,  
abuts and seals off the internal surface of the shell  
of the needle protective cap.
- 10 5. Procedure for packaging a syringe or carpule as  
defined by any one of claims 1 to 4, comprising:
  - (a) cleaning of the glass syringe barrel;
  - (b) performing a heat-curing siliconization so that the  
15 cannula cap with the sealing disk located inside it  
and the sealing part mounted in the detent position  
presses against the syringe barrel;
  - (c) sterilizing the syringe or carpule; and
  - (d) filling the syringe barrel; and pushing down the  
sealing component into the locking position.
- 20 6. Procedure according to claim 5, wherein the syringe  
barrel is bubble-free when it is filled.

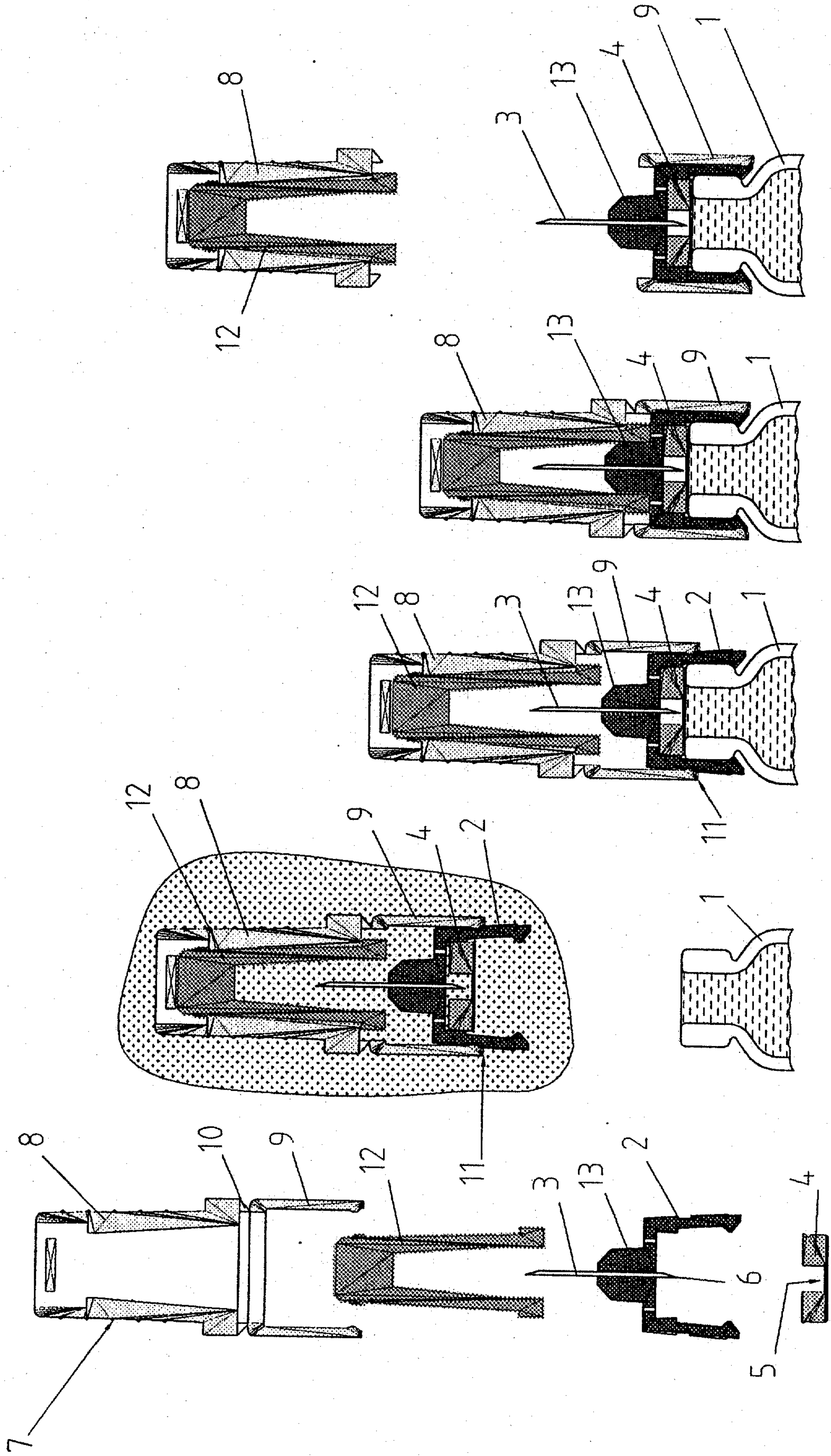


Fig.1

Fig. 2

Fig.3

Fig.4

Fig.5

