[0004] In each case, the outlet valve has the effect that, after it has been closed, no liquid which has passed into the second portion of the outlet channel on a side of the outlet valve directed away from the liquid reservoir, or which has remained in the area around the outlet opening outside the outlet channel, can be sucked back into the dispenser. A possible contamination of the content of the liquid reservoir by liquid residues that have been sucked back is thereby prevented. The residual liquid therefore remains in an area accessible from the outside. Contact with the atmosphere results in rapid drying of the residual liquid.

[0005] In order to permit rapid drying of the residual liquid even when a protective cap is fitted on the dispenser, it is known from DE 10 2011 086 755 A1 to provide the protective cap of the dispenser with ventilation openings that create a permanent connection between the area where a residual liquid may remain and an external environment. However, the ventilation openings for their part may again cause contamination.

[0006] In order to avoid contamination according to DE 10 2011 086 755 A1, surfaces of the outlet channel downstream of the outlet valve, as viewed in the discharge direction, and/or an outer surface of a housing surrounding the outlet opening are designed to be antibacterial, wherein the antibacterial state is limited exclusively to these surfaces.

Object and solution

[0007] ~~The object~~ Embodiments of the invention ~~is to~~ make available a protective cap for a dispenser, which protective cap permits rapid drying and alleviates the problems of admission of microorganisms into the

protective cap. The object of the invention is also to make available a discharge device comprising a dispenser with a corresponding protective cap.

[0008] ~~According to a first aspect, a protective cap for a dispenser is provided, wherein the protective cap comprises an inner cap and an outer cap, the inner cap has at least one ventilation opening for communication between an interior of the protective cap and an external environment, and, before a first use, the outer cap is mounted on the inner cap in a first position in which the inner cap and the outer cap are sealingly in contact with each other and the at least one ventilation opening is separated in an airtight and germproof manner from the environment, and the outer cap is movable relative to the inner cap from the first position to at least a second position in which the inner cap and the outer cap are not sealingly in contact with each other and the at least one ventilation opening communicates with the environment.~~

According to a first aspect of the present invention, there is provided a protective cap for a dispenser for discharging pharmaceutical and/or cosmetical liquids, wherein the dispenser has a housing, a liquid reservoir and an outlet opening through which the liquid can be discharged into a surrounding atmosphere, wherein the protective cap comprises an inner cap and an outer cap, the inner cap is provided for repeated detachment from and attachment to the housing and has at least one ventilation opening for communication between an interior of the protective cap and an external environment, and before a first use, the outer cap is mounted on the inner cap in a first position in which the inner cap and the outer cap are sealingly in contact with each other and the at least one ventilation opening is separated in an airtight and germproof

manner from the environment, and the outer cap is movable relative to the inner cap from the first position to at least a second position in which the inner cap and the outer cap are not sealingly in contact with each other and the at least one ventilation opening communicates with the environment.

[0009] ~~According to a second aspect, a discharge device is created comprising a dispenser for discharging pharmaceutical and/or cosmetical liquids, with a liquid reservoir and an outlet opening through which the liquid can be discharged into a surrounding atmosphere, and a protective cap with an inner cap and an outer cap, wherein the inner cap has at least one ventilation opening for communication between an interior of the protective cap and an external environment, wherein, before a first use, the outer cap is mounted on the inner cap in a first position in which the inner cap and the outer cap are sealingly in contact with each other and the at least one ventilation opening is separated in an airtight and germproof manner from the environment, and the outer cap is movable relative to the inner cap from the first~~

~~position to at least a second position in which the inner cap and the outer cap are not sealingly in contact with each other and the at least one ventilation opening communicates with the environment in an airtight and germproof manner.~~

According to a second aspect of the present invention, there is provided a discharge device comprising a dispenser for discharging pharmaceutical and/or cosmetical liquids, with a housing, a liquid reservoir and an outlet opening through which the liquid can be discharged into a surrounding atmosphere, and a protective cap with an inner cap and an outer cap, wherein the inner cap is provided for repeated detachment from and attachment to the housing and has at least one ventilation opening for communication between an interior of the protective cap and an external environment, and before a first use, the outer cap is mounted on the inner cap in a first position in which the inner cap and the outer cap are sealingly in contact with each other and the at least one ventilation opening is separated in an airtight and germproof manner from the environment, and the outer cap is movable relative to the inner cap from the first position to at least a second position in which the inner cap and the outer cap are not sealingly in contact with each other and the at least one ventilation opening communicates with the environment in an airtight and germproof manner.

[0010] A protective cap as provided according to embodiments of this invention is a cap which can be separated from the dispenser's housing to get access to the outlet opening provided on the housing. After usage of the discharge device the protective cap or at least its inner cap can be fixed to the housing again to cover the outlet opening .

[0011] Rapid drying of the residual liquid is achieved by virtue of the communication between the interior of the protective cap, more precisely of the inner cap, and the external environment. The invention is also based on the knowledge that, before a first use and during storage, transport, etc., germs can gather on the protective cap over the course of time. The quantity of germs that have gathered is dependent, among other things, on the period of time before a first use and on a microbial burden of the environment. If germs are left to gather, this can lead to germs entering the interior of the protective cap via a ventilation opening.

[0012] Germs within the meaning of the present invention are to be understood as all microbial pathogens, in particular bacteria and viruses. In the context of the application, a germproof and airtight closure or a germproof and airtight seal is to be understood as a seal with which there is a leakage rate of less than or equal to 10^{-6} mbar 1/s during storage of the dispenser under normal or standard conditions. A test of impermeability to germs is carried out, for

Claims

1. A protective cap for a dispenser ~~(2)~~ for discharging pharmaceutical and/or cosmetical liquids ~~(4)~~, wherein the dispenser ~~(2)~~ has

   - a housing,
   - a liquid reservoir ~~(21)~~ and
   - an outlet opening ~~(24)~~ through which the liquid ~~(100)~~ can be discharged into a surrounding atmosphere,

   wherein

   - the protective cap ~~(3)~~ comprises an inner cap ~~(4)~~ and an outer cap ~~(5)~~,
   - the inner cap ~~(4)~~ is provided for repeated detachment from and attachment to the housing and has at least one ventilation opening ~~(40)~~ for communication between an interior of the protective cap ~~(3)~~ and an external environment, and
   - before a first use, the outer cap ~~(5)~~ is mounted on the inner cap ~~(4)~~ in a first position in which the inner cap ~~(4)~~ and the outer cap ~~(5)~~ are sealingly in contact with each other and the at least one ventilation opening ~~(40)~~ is separated in an airtight and germproof manner from the environment, and
   - the outer cap ~~(5)~~ is movable relative to the inner cap ~~(4)~~ from the first position to at least a second position in which the inner cap ~~(4)~~ and the outer cap ~~(5)~~ are not

sealingly in contact with each other and the at least one ventilation opening ~~(40)~~ communicates with the environment.

2. The protective cap as claimed in claim 1, wherein at least one of inner cap ~~(4)~~ and outer cap ~~(5)~~ has a blocking element ~~(56)~~ that counteracts a movement of the outer cap ~~(5)~~ relative to the inner cap ~~(4)~~ to the first position.

3. The protective cap as claimed in claim 2, wherein the at least one blocking element ~~(56)~~ is adjustable between a blocking position, in which a movement of the outer cap ~~(5)~~ relative to the inner cap ~~(4)~~ is blocked, and a release position, in which the outer cap ~~(5)~~ is movable relative to the inner cap ~~(4)~~ to the first position, wherein the blocking element ~~(56)~~ is forced into the blocking position.

4. The protective cap as claimed in claim 3, wherein the at least one blocking element ~~(56)~~ is forced into the blocking position on account of elastic restoring forces.

5. The protective cap as claimed in claim 3, wherein the at least one blocking element ~~(56)~~ is arranged on the outer cap ~~(5)~~, and the inner cap ~~(4)~~ has at least one complementary opening, wherein, in order to allow a movement of the outer cap ~~(5)~~ relative to the inner cap ~~(4)~~ to the first position, the at least one blocking element ~~(56)~~ can be guided into the at least one complementary opening in the release position.

6. The protective cap as claimed in claim 2, wherein the at least one blocking element ~~(56)~~ is designed as a radially outwardly protruding tab.

7. The protective cap as claimed in claim 6, wherein at least one protection element is assigned to at least one of the blocking elements ~~(56)~~ in order to avoid a manual operation of said blocking element ~~(56)~~.

8. The protective cap as claimed in claim 1, wherein the outer cap ~~(5)~~ is designed in one piece, in particular integrally, with a tamper-evident safety device ~~(59)~~ which, before a first use of the dispenser ~~(2)~~, has to be separated at least partially irreversibly from the dispenser ~~(2)~~.

9. The protective cap as claimed in claim 8, wherein the tamper-evident safety device ~~(59)~~ has a first segment ~~(590)~~ and a second segment ~~(591)~~, which are each ring-shaped, wherein the second segment ~~(591)~~ is arranged between a portion ~~(52)~~ of the outer cap ~~(5)~~ and the first segment ~~(590)~~, and the second segment ~~(590)~~ is connected to the first segment ~~(591)~~ and to the outer cap ~~(5)~~ by means of predetermined breaking points ~~(593, 594)~~.

10. The protective cap as claimed in claim 8, wherein the outer cap ~~(5)~~ has a coupling geometry for connecting it to the dispenser ~~(2)~~ such that the connection cannot be undone without destruction, and the tamper-evident safety device ~~(59)~~ is designed in the form of predetermined breaking points ~~(599)~~ extending at least partially in the longitudinal direction on the outer cap ~~(5)~~.

11. A discharge device comprising

- a dispenser ~~(2)~~ for discharging pharmaceutical and/or cosmetical liquids ~~(4)~~, with
  - a housing,
  - a liquid reservoir ~~(21)~~ and
  - an outlet opening ~~(24)~~ through which the liquid ~~(100)~~ can be discharged into a surrounding atmosphere,

  and
  - a protective cap ~~(3)~~ with an inner cap ~~(4)~~ and an outer cap ~~(5)~~,

  wherein
  - the inner cap ~~(4)~~ is provided for repeated detachment from and attachment to the housing and has at least one ventilation opening ~~(40)~~ for communication between an interior of the protective cap ~~(3)~~ and an external environment, and
  - before a first use, the outer cap ~~(5)~~ is mounted on the inner cap ~~(4)~~ in a first position in which the inner cap ~~(4)~~ and the outer cap ~~(5)~~ are sealingly in contact with each other and the at least one ventilation opening ~~(40)~~ is separated in an airtight and germproof manner from the environment, and
  - the outer cap ~~(5)~~ is movable relative to the inner cap ~~(4)~~ from the first position to at least a second position in which the inner cap ~~(4)~~ and the outer cap ~~(5)~~ are not sealingly in contact with each other and the at least one ventilation opening ~~(40)~~ communicates with the environment in an airtight and germproof manner .

12. The discharge device as claimed in claim 11, wherein the dispenser further comprises an outlet channel ~~(23)~~ which connects the liquid reservoir ~~(21)~~ to the outlet opening ~~(24)~~, and an outlet valve ~~(25)~~ which opens depending on pressure or can be manually actuated and which is arranged in the outlet channel ~~(23)~~ and, in a closed state, closes the outlet channel ~~(23)~~.