Claims

1. A syringe, the syringe (1) comprising a body (2), a stopper (10) and a plunger (4), the body (2) comprising an outlet (12) at an outlet end (14) and the stopper (10) being arranged within the body (2) such that a front surface (16) of the stopper (10) and the body (2) define a variable volume chamber (18) from which a fluid (20) can be expelled though the outlet (12), the plunger (4) comprising a plunger contact surface (22) at a first end (24) and a rod (26) extending between the plunger contact surface (22) and a rear portion (25), characterized in that the stopper (10) provides a sealing function by defining the rear of the variable volume chamber (18) with a fluid tight seal and the plunger contact surface (22) arranged to contact the stopper (10) but not couple thereto, such that the plunger (4) can be used to force the stopper (10) towards the outlet end (14) of the body (2), reducing the volume of the variable volume chamber (18), but not to move the stopper (10) away from the outlet end (14)

2. A syringe as claimed in claim 1, in which the plunger contact surface (22) is a substantially planar disc and the plunger contact surface (22) contacts a rear surface (60) of the stopper (10).

3. A syringe as claimed in any preceding claim in which the rod (26) comprises at least one rod shoulder (32) directed away from the outlet end (14) and the syringe (1) includes a backstop (6) arranged at a rear portion of the body (2), the backstop (6) including a backstop shoulder (34) directed towards the outlet end (14) to cooperate with the rod shoulder (32) to substantially prevent movement of the plunger rod (26) away from the

outlet end (14) when the backstop shoulder (34) and rod shoulder (32) are in contact.

4. A syringe as claimed in any preceding claim, in which the rod shoulder (32) is arranged within the external diameter of the rod (26).

5. A syringe as claimed in any preceding claim, in which the rod shoulder (32) comprises a substantially disc shaped portion on the rod (26).

6. A syringe as claimed in any of claims 3 to 5, in which the backstop (6) is removable from the syringe (1).

7. A syringe as claimed in claim 6, in which the backstop (6) is configured to substantially sandwich terminal flanges of the body (2).

8. A syringe as claimed in any of claims 3 to 7, in which, when arranged with the plunger contact surface (22) in contact with the stopper (10) and the variable volume chamber (18) is at its intended maximum volume there is a clearance of no more than 2mm between the rod shoulder (34) and backstop shoulder (32).

9. A syringe as claimed in any preceding claim, in which the variable volume chamber has an inner diameter of between 4mm and 5mm.

10. A syringe as claimed in any preceding claim, in which the syringe is dimensioned so as to have a nominal maximum volume of between 0.4ml and 0.6ml.

11. A syringe as claimed in any preceding claim, in which the syringe (1) is an ophthalmic syringe and the variable volume chamber (18) is filled with an injectable medicament comprising a medicament suitable for the treatment of an ocular disease and the outlet is reversibly sealed.

12. A syringe pack comprising a sealed package and a sterile syringe (1) as claimed in any preceding claim.

13. A method of assembling a syringe, the method comprising the steps of:

i) providing a body (2) and a stopper (10), the body (2) comprising an outlet (12) at an outlet end (14) and the stopper (10) being arranged within the body (2) such that a front surface (16) of the stopper (10) and the body (2) define a variable volume chamber (18) from which a fluid (20) can be expelled though the outlet (12), the stopper (10) providing a sealing function by defining the rear of the variable volume chamber (18) with a fluid tight seal, the outlet (12) being releasably sealed and the variable volume chamber (18) containing a medicament; and

ii) providing a plunger (4) comprising a plunger contact surface (22) at a first end and a rod (26) extending between the plunger contact surface (22) and a rear portion (25) and arranging the plunger contact surface (22) and at least part of the plunger (4) within the body (2) without coupling the plunger (4) to the stopper (10).

14. A method as claimed in claim 13, in which the variable volume chamber (18) contains an injectable

medicament comprising a medicament suitable for the treatment of an ocular disease.

15. A method as claimed in claim 13 or claim 14, in which the rod comprises at least one rod shoulder directed away from the plunger contact surface and a backstop is provided, the backstop including a backstop shoulder directed towards the outlet end, the backstop is coupled to the syringe body after the plunger has been arranged in the body and the rod shoulder is arranged between the outlet end and the backstop shoulder.

16. A method as claimed in any of claims 13 to 15, in which the plunger rod is dropped into the syringe body.

17. A plunger suitable for use in the syringe of any of claims 1 to 11, or the method of claims 13 to 16.

Claims

1. A syringe, the syringe (1) comprising a body (2), a stopper (10) and a plunger (4), the body (2) comprising an outlet (12) at an outlet end (14) and the stopper (10) being arranged within the body (2) such that a front surface (16) of the stopper (10) and the body (2) define a variable volume chamber (18) from which a fluid (20) can be expelled though the outlet (12), the plunger (4) comprising a plunger contact surface (22) at a first end (24) and a rod (26) extending between the plunger contact surface (22) and a rear portion (25), characterized in that the stopper (10) provides a sealing function by defining the rear of the variable volume chamber (18) with a fluid tight seal and the plunger contact surface (22) is arranged to contact the stopper (10) but not couple thereto, such that the plunger (4) can be used to force the stopper (10) towards the outlet end (14) of the body (2), reducing the volume of the variable volume chamber (18), but not to move the stopper (10) away from the outlet end (14) and in that the syringe is an ophthalmic syringe and the variable volume chamber is filled with an injectable medicament comprising a medicament suitable for the treatment of an ocular disease and the outlet is reversibly sealed and in that the stopper is provided with an inner bore which is so dimensioned as to be able to connect a plunger in a snap fit manner.

2. The syringe as claimed in claim 1, in which the plunger contact surface (22) is a substantially planar disc and the plunger contact surface (22) contacts a rear surface (60) of the stopper (10).

3. The syringe as claimed in any one of the preceding claims, in which the rod (26) comprises at least one rod shoulder (32) directed away from the outlet end (14) and the syringe (1) includes a backstop (6) arranged at a rear portion of the body (2), the backstop (6) including a backstop shoulder (34) directed towards the outlet end (14) to cooperate with the rod shoulder (32) to substantially prevent movement of the plunger rod (26) away from the outlet end (14) when the backstop shoulder (34) and rod shoulder (32) are in contact.

4. The syringe as claimed in any one of the preceding claims, in which the rod shoulder (32) is arranged within the external diameter of the rod (26).

5. The syringe as claimed in any one of the preceding claims, in which the rod shoulder (32) comprises a substantially disc shaped portion on the rod (26).

6. The syringe as claimed in any one of claims 3 to 5, in which the backstop (6) is removable from the syringe (1).

7. The syringe as claimed in claim 6, in which the backstop (6) is configured to substantially sandwich terminal flanges of the body (2).

8. The syringe as claimed in any one of claims 3 to 7, in which, when arranged with the plunger contact surface (22) in contact with the stopper (10) and the variable volume chamber (18) is at its intended maximum volume there is a clearance of no more than 2mm between the rod shoulder (34) and backstop shoulder (32).

9. The syringe as claimed in any one of the preceding claims, in which the variable volume chamber has an inner diameter of between 4mm and 5mm.

10. The syringe as claimed in any one of the preceding claims, in which the syringe is dimensioned so as to have a nominal maximum volume of between 0.4ml and 0.6ml.

11. A syringe pack comprising a sealed package and a sterile syringe (1) as claimed in any one of the preceding claims.

12. A method of assembling a syringe, the method comprising the steps of:

i) providing a body (2) and a stopper (10), the body (2) comprising an outlet (12) at an outlet end (14) and the stopper (10) being arranged within the body (2) such that a front surface (16) of the stopper (10) and the body (2) define a variable volume chamber (18) from which a fluid (20) can be expelled though the outlet (12), the stopper (10) providing a sealing function by defining the rear of the variable volume chamber (18) with a fluid tight seal and being provided with an inner bore which is so dimensioned as to be able to connect a plunger in a snap fit manner, the outlet (12) being releasably sealed and the variable volume chamber (18) containing a medicament;

ii) providing a plunger (4) comprising a plunger contact surface (22) at a first end and a rod (26) extending between the plunger contact surface (22) and a rear portion (25) and arranging the plunger contact surface (22) and at least part of the plunger (4) within

the body (2) without coupling the plunger (4) to the stopper (10);

iii) providing an injectable medicament comprising a medicament suitable for the treatment of an ocular disease; and

iv) assembling the syringe such that the variable volume chamber (18) contains the injectable medicament.

13. The method as claimed in claim 12, in which the rod comprises at least one rod shoulder directed away from the plunger contact surface and a backstop is provided, the backstop including a backstop shoulder directed towards the outlet end, the backstop is coupled to the syringe body after the plunger has been arranged in the body and the rod shoulder is arranged between the outlet end and the backstop shoulder.

14. The method as claimed in claim 12 or claim 13, in which the plunger rod is dropped into the syringe body.