CLAIMS

1. An inhaler for producing an inhalable aerosol of powdered medicament including an aerosolising device having a chamber of substantially circular cross- section defined by an inner curved surface and having a longitudinal axis, an inlet port at one end of the chamber for the flow of drug laden air into the chamber through said inlet port and, an outlet port at the opposite end of the chamber such that drug laden air flows through the chamber between said ports and out of the chamber through the outlet port and, a bypass air inlet for the flow of clean air into the chamber in a tangential direction, said bypass air inlet being configured so that air entering the chamber through said bypass air inlet forms a cyclone in the chamber that interacts with the drug laden air as the drug laden air flows between the inlet and outlet ports wherein said inlet port is coaxial with said longitudinal axis of the chamber and said bypass air inlet is formed in the curved inner surface of the chamber such that clean air enters the chamber in a tangential direction to said curved inner surface and forms said cyclone about the longitudinal axis of the chamber along which the drug laden air is flowing between the inlet and outlet ports.

2. An inhaler according to claim 1, wherein the chamber is configured so that the cyclone interacts with the drug laden air flow so as to cause the drug laden air flow to assume a helical path as it flows from the inlet port to the outlet port.

3. An inhaler according to claim 1 or claim 2, wherein the chamber is tapered.

4. An inhaler according to any one of the preceding claims, wherein the inlet port is formed in a base, the base including a mesh portion, the inlet port being formed by the openings in said mesh.

5. An inhaler according to claim 4, wherein the inlet port comprises at least one opening in the base, the or each opening extending through the base at an angle relative to the longitudinal axis of the chamber.

6. An inhaler according to claim 4 or claim 5, wherein the chamber comprises an end wall at the other end of the chamber opposite the base, the end wall comprising a mesh, the outlet port being formed from openings in the mesh.

7. An inhaler according to claim 6, wherein the chamber has a portion that extends beyond the end wall in a direction away from the inlet port.

8. An inhaler according to any one of claims 4 to 7, wherein the bypass air inlet is located in a wall of the chamber adjacent to the base.

9. An inhaler according to claim 8, wherein the base forms a sidewall of the tangential bypass air inlet.

10. An inhaler according to claim 9, wherein the bypass air inlet is partly formed from the end wall.

11. An inhaler according to any one of claims 8 to 10, wherein the tangential bypass air inlet is formed from an arcuately shaped flow path.

12. An inhaler according to any one of claims 8 to 11, comprising at least two bypass air inlets for the flow of clean bypass air into the chamber.

13. An inhaler according to any one of the preceding claims, wherein the chamber is formed within a mouthpiece.

14. An inhaler according to claim 13, wherein the chamber is a separate component received within the mouthpiece.

15. An inhaler according to any one of the preceding claims, comprising a blister piercing element operable to puncture the lid of a blister containing a dose of medicament to enable a user to inhale said dose through said chamber.

16. An inhaler according to claim 15, wherein the blister piercing member comprises a piercing element upstanding from a surface and clean air inlet and drug laden air outlet flow passages extending through the blister piercing member from said surface in the vicinity of each piercing element, said piercing element being operable to puncture a clean air inlet opening and a drug laden air outlet opening in the blister such that, when a user inhales, clean air can flow through the clean air inlet flow passage(s) in the blister piercing member and clean air inlet opening(s) into the blister to entrain the dose contained in the blister, the drug laden air flowing

out of the blister through the drug laden air outlet opening in the blister and drug laden air outlet flow passage in the blister piercing member.

17. An inhaler according to claim 16, wherein the drug laden air outflow passage is in communication with the inlet port of the chamber.

18. An inhaler according to claim 16 or 17, wherein the clean air inlet opening comprises a plurality of clean air inlet openings that surround the drug laden air outlet opening.

19. An inhaler according to any one of claims 15 to 18, comprising a housing configured to receive a strip having a plurality of blisters, each blister having a puncturable lid and containing a dose of medicament for inhalation by a user, means operable to drive the strip to sequentially move each blister into alignment with the blister piercing member and actuating means operable to cause the blister piercing member to pierce the lid of said aligned blister.

20. An inhaler according to any one of claims 15 to 19, comprising a housing configured to receive a single blister having a puncturable lid and containing a dose of medicament for inhalation by a user and actuating means operable to cause the blister piercing member to pierce the lid of said blister received in the housing.

Claims

1. An inhaler for producing an inhalable aerosol of powdered medicament including an aerosolising device having a chamber of substantially circular cross-section, inlet and outlet ports at opposite ends of the chamber for the flow of drug laden air through the chamber between said ports and, a bypass air inlet for the flow of clean air into the chamber, said bypass air inlet being configured so that air entering the chamber through said inlet forms a cyclone in the chamber that interacts with the drug laden air flowing between the inlet and outlet ports.

2. An inhaler according to claim 1, wherein the bypass air inlet is arranged so that air enters the chamber through said inlet substantially tangential to the wall of the chamber.

3. An inhaler according to claim 1 or claim 2, wherein the chamber is configured so that the cyclone interacts with the drug laden air flow so as to cause the drug laden air flow to assume a helical path as it flows from the inlet port to the outlet port.

4. An inhaler according to any preceding claim, wherein the chamber is tapered.

5. An inhaler according to claim 4, wherein the chamber tapersin a direction extending from the outlet port towards the inlet port.

6. An inhaler according to claim 4, wherein the chamber tapers in a direction extending from the inlet port towards the outlet port.

7. An inhaler according to any preceding claim, comprising a base, the inlet port being formed in said base.

8. An inhaler according to claim 7, wherein the base includes a mesh portion, the inlet port being formed by the openings in said mesh.

9. An inhaler according to claim 8, wherein the inlet port is coaxial with a longitudinal axis of the chamber.

10. An inhaler according to claim 9, wherein the inlet port is offset from the longitudinal axis of the chamber.

11. An inhaler according to any of claims 7 to 10, wherein the inlet port comprises at least one opening in said base.

12. An inhaler according to claim 11, wherein the or each opening extends through the base at an angle relative to the longitudinal axis of the chamber.

13. An inhaler according to any of claims 7 to 12, wherein the chamber comprises an end wall at the other end of the chamber opposite the base, the outlet port being formed in said end wall.

14. An inhaler according to claim 13, wherein the end wall comprises a mesh, the outlet port being formed from openings in the mesh.

15. An inhaler according to claim 13 or 14, wherein the chamber has a portion that extends beyond the end wall in a direction away from the inlet port.

16. An inhaler according to claim 15, wherein said portion tapers outwardly away from said end wall to form a diffuser.

17. An inhaler according to any of claims 7 to 16, wherein the bypass air inlet is located in a wall of the chamber adjacent to the base.

18. An inhaler according to claim 17, wherein the base forms a sidewall of the tangential bypass air inlet.

19. An inhaler according to any of claims 7 to 16, wherein the tangential bypass air inlet is spaced away from the base towards the end wall.

20. An inhaler according to claim 19, wherein the bypass air inlet is adjacent to the end wall.

21. An inhaler according to claim 19, wherein the bypass air inlet is partly formed from the end wall.

22. An inhaler according to any of claims 17 to 21, wherein the tangential bypass air inlet is formed from an arcuately shaped flow path.

23. An inhaler according to any of claims 17 to 22, comprising at least two bypass air inlets for the flow of clean bypass air into the chamber.

24. An inhaler according to any preceding claim, wherein the chamber is formed within a mouthpiece.

25. An inhaler according to claim 24, wherein the chamber is a separate component received within the mouthpiece.

26. An inhaler according to claim 25, wherein said separate component is separable from the mouthpiece.

27. An inhaler according to any of claims 1 to 23, wherein the outlet port of the chamber is connected to a separate mouthpiece.

28. An inhaler according to any preceding claim, comprising a blister piercing element operable to puncture the lid of a blister containing a dose of medicament to enable a user to inhale said dose through said chamber.

29. An inhaler according to claim 28, wherein the blister piercing member comprises a piercing element upstanding from a surface and clean air inlet and drug laden air outlet flow passages extending through the blister piercing member from said surface in the vicinity of each piercing element, said piercing element being operable to puncture a clean air inlet opening and a drug laden air outlet opening in the blister such that, when a user inhales, clean air can flow through the clean air inlet flow passage(s) in the blister piercing member and clean air inlet opening(s) into the blister to entrain the dose contained in the blister, the drug laden air flowing out of the blister through the drug laden air outlet opening in the blister and drug laden air outlet flow passage in the blister piercing member.

30. An inhaler according to claim 29, wherein the drug laden air outflow passage is in communication with the inlet port of the chamber.

31. An inhaler according to claim 29 or 30, wherein the clean air inlet opening comprises a plurality of clean air inlet openings that surround the drug laden air outlet opening.

32. An inhaler according to claim 31, wherein the clean air inlet openings are arranged symmetrically around the drug laden air outlet opening.

33. An inhaler according to any of claims 28 to 32, comprising a housing configured to receive a strip having a plurality of blisters, each blister having a puncturable lid and containing a dose of medicament for inhalation by a user, means operable to drive the strip to sequentially move each blister into alignment with the blister piercing member and actuating means operable to cause the blister piercing member to pierce the lid of said aligned blister.

34. An inhaler according to any of claims 28 to 32, comprising a housing configured to receive a single blister having a puncturable lid and containing a dose of medicament for inhalation by a user and actuating means operable to cause the blister piercing member to pierce the lid of said blister received in the housing.