Claims

1. A medicament delivery device (1) comprising:

two reservoirs (22, 22a) containing bulk quantities of different medicaments (21, 21a) that are to be administered together, first and second metering members (25, 25a) mounted for rotation adjacent to the reservoirs (22, 22a), wherein each reservoir is associated with a separate metering member, the metering members being adapted when at a filling position to volumetrically meter desired doses of medicament from the reservoirs and by rotation of the metering members in a first sense to transfer said doses to a dispensing position at which the doses can be dispensed from the device, and

a drive wheel (90) mounted between the first (25) and second (25a) metering members for rotation about a common axis (X-X) such that rotation of the drive wheel causes rotation of the metering members, wherein the drive wheel rotates within a generally circular recess (26) formed in a support component (100, 100a) that holds the metering members;

wherein operation of the device is brought about by means of a push-button or the like, which acts upon an actuator that undergoes a reciprocating motion and which actuator acts upon the drive wheel;

wherein rotation of the wheel (90) is brought about by engagement of the actuator (70) with a plurality of lugs (93) that are equiangularly spaced around the wheel (90);

the drive wheel (90) being provided with formations effective to prevent rotation of the metering members from the filling position in the sense opposite to the first sense, these formations constituting a ratchet-type mechanism;

characterized in that the drive wheel (90) is provided with a plurality of equiangularly spaced pawls (95) at its periphery that engage, when the metering members (25, 25a) are in the filling position, with corresponding ratchet formations (102) formed in the wall of the circular recess (26) adjacent to the periphery of the wheel and spaced sufficiently from the edge of the wheel to permit rotation in the first sense but sufficiently close to the wheel to permit engagement of the pawls (95) with the ratchet formations (102) whenever a metering cup (27) is moved into the filling position thereby to prevent reverse rotation of the metering members.

2. A medicament delivery device according to Claim 1, which is an inhaler.

3. A medicament delivery device according to Claim 2, which is a dry powder inhaler.

4. A medicament delivery device according to any one of Claims 1 to 3, which is to dispense unit doses of two or more medicaments from separate reservoirs within the device, those unit doses then being administered to the patient simultaneously.

5. A medicament delivery device according to any one of Claims 1 to 4, wherein the wheel is provided with two pawls (95).

6. A medicament delivery device according to any one of Claims 1 to 5, wherein the pawls (95) are resilient and extend a short distance outwardly from the circumference of the wheel (90).

7. A medicament delivery device as claimed in any preceding claim, which is charged with one or more medicaments selected from β_2-agonists, eg fenoterol, formoterol, pirbuterol, reproterol, rimiterol, salbutamol, salmeterol and terbutaline; non-selective beta-stimulants such as isoprenaline; xanthine bronchodilators, eg theophylline, aminophylline and choline theophyllinate; anticholinergics, eg ipratropium bromide, oxitropium and tiotropium; mast cell stabilisers, eg sodium cromoglycate and ketotifen; bronchial anti-inflammatory agents, eg nedocromil sodium; and steroids, eg beclomethasone, fluticasone, budesonide, flunisolide, triamcinolone, mometasone and ciclesonide; and/or salts or derivatives thereof.

8. A medicament delivery device as claimed in any preceding claim, which is charged with a combination of medicaments selected from beclomethasone dipropionate and formoterol; beclomethasone dipropionate and salmeterol; fluticasone and formoterol; fluticasone and salmeterol; budesonide and formoterol; budesonide and salmeterol; flunisolide and formoterol; flunisolide and salmeterol; ciclesonide and salmeterol; ciclesonide and formoterol; mometasone and salmeterol; and mometasone and formoterol.

Claims

1. A medicament delivery device comprising a metering member mounted for rotation adjacent a reservoir containing a bulk quantity of medicament, the metering member being adapted when at a filling position to volumetrically meter a desired dose of medicament from the reservoir and by rotation of the metering member in a first sense to transfer said dose to a dispensing position at which the dose can be dispensed from the device, the metering member and/or a component to which the metering member is operably linked being provided with formations effective to prevent rotation of the metering member from the filling position in the sense opposite to the first sense, the formations effective to prevent rotation of the metering member from the filling position in the sense opposite to the first sense constituting a ratchet-type mechanism, the metering member and/or the component to which the metering member is operably linked on the one hand and an adjacent surface of the device on the other hand being provided with ratchet and pawl formations, wherein the metering member and/or the component to which the metering member is operably linked is provided with one or more pawls that engage, when the metering member is in the filling position, with corresponding ratchet formations to prevent reverse rotation of the metering member.

2. A medicament delivery device according to Claim 1, which is an inhaler.

3. A medicament delivery device according to Claim 2, which is a dry powder inhaler.

4. A medicament delivery device according to any preceding claim, which is to dispense unit doses of a single medicament.

5. A medicament delivery device according to any one of Claims 1 to 3, which is to dispense unit doses of a formulation containing two or more medicaments.

6. A medicament delivery device according to any one of Claims 1 to 3, which is to dispense unit doses of two or more medicaments from separate reservoirs within the device, those unit doses then being administered to the patient simultaneously.

7. A medicament delivery device according to any preceding claim, wherein operation of the device is brought about by means of a push-button or the like, which acts upon an actuator

that undergoes a reciprocating motion.

8. A medicament delivery device according to Claim 7, wherein the actuator acts directly on the metering member.

9. A medicament delivery device according to Claim 7, wherein the actuator acts upon a component that is operably linked to the metering member.

10. A medicament delivery device according to Claim 9, wherein the device contains more than one reservoir of medicament containing different medicaments that are to be administered together.

11. A medicament delivery device according to Claim 10, wherein each reservoir is associated with a separate metering member, and the metering members are coupled to a drive component such that rotation of the drive component causes rotation of the metering members.

12. A medicament delivery device according to Claim 11, wherein the device contains two reservoirs of medicament, with first and second metering members, and the drive component has the form of a wheel mounted between the first and second metering members for rotation about a common axis.

13. A medicament delivery device according to Claim 12, wherein rotation of the wheel is brought about by engagement of the actuator with a plurality of lugs that are equiangularly spaced around the wheel.

14. A medicament delivery device according to Claim 12 or Claim 13, wherein the wheel is provided with one or more pawls at its periphery.

15. A medicament delivery device according to Claim 14, wherein the wheel is provided with two pawls.

16. A medicament delivery device according to Claim 14 or Claim 15, wherein the pawls are resilient and extend slightly from the circumference of the wheel.

~~17. A medicament delivery device according to any one of Claims 14 to 16, wherein a number of~~

ratchet formations are formed in a surface of the device adjacent to the periphery of the wheel.

18. A medicament delivery device according to Claim 17, wherein the wheel rotates within a generally circular recess formed in a support component that holds the metering member, and the ratchet formations are formed in the wall of the circular recess, which is spaced from the edge of the wheel sufficiently to permit rotation in the first sense but is sufficiently close to the wheel to permit engagement of the pawl(s) with the ratchet formations whenever a metering cup is moved into the filling position.

19. A medicament delivery device as claimed in any preceding claim, which is charged with one or more medicaments selected from β2-agonists, eg fenoterol, formoterol, pirbuterol, reproterol, rimiterol, salbutamol, salmeterol and terbutaline; non-selective beta-stimulants such as isoprenaline; xanthine bronchodilators, eg theophylline, aminophylline and choline theophyllinate; anticholinergics, eg ipratropium bromide, oxitropium and tiotropium; mast cell stabilisers, eg sodium cromoglycate and ketotifen; bronchial anti-inflammatory agents, eg nedocromil sodium; and steroids, eg beclomethasone, fluticasone, budesonide, flunisolide, triamcinolone, mometasone and ciclesonide; and/or salts or derivatives thereof.

20. A medicament delivery device as claimed in any preceding claim, which is charged with a combination of medicaments selected from beclomethasone dipropionate and formoterol; beclomethasone dipropionate and salmeterol; fluticasone and formoterol; fluticasone and salmeterol; budesonide and formoterol; budesonide and salmeterol; flunisolide and formoterol; flunisolide and salmeterol; ciclesonide and salmeterol; ciclesonide and ~~formoterol; mometasone and salmeterol; and mometasone and formoterol.~~