Claims

1. A medicament delivery device ~~(1)~~ comprising an actuation mechanism by successive operation of which a predetermined number of unit doses of medicament can be dispensed, the device including a locking mechanism for preventing further operation of the actuation mechanism after dispensing of said predetermined number of unit doses, characterised in that said locking mechanism comprises a resilient member ~~(51)~~, a formation ~~(18)~~ with which the resilient member ~~(51)~~ is engageable to disable operation of the actuation mechanism, and a barrier member ~~(20)~~ that prevents engagement of the resilient member ~~(51)~~ and the formation ~~(18)~~ until said predetermined number of unit doses has been dispensed, wherein operation of the device is brought about by means of a push-button ~~(4)~~ which acts upon a dispensing actuator and a dose counter actuator that are integrally formed as a single component that undergoes a reciprocating action, and the push-button ~~(4)~~ not only causes dispensing of a unit dose of medicament, but also operates a dose counting mechanism that provides to the user of the device an indication of the number of doses that have been dispensed or alternatively the number of doses that remain to be dispensed; wherein the resilient member ~~(51)~~ is an elongate arm which is formed integrally with the dose counter actuator ~~(50)~~ and which is displaced along an axis parallel to the axis of reciprocating movement of the dose counter actuator; and wherein the barrier member ~~(20)~~ is part of the dose counting mechanism, the barrier member ~~(20)~~ being interposed between the resilient member ~~(51)~~ and the formation ~~(18)~~ until the last of the predetermined number of unit doses has been dispensed, wherein operation of the device to dispense the last of the predetermined doses has the effect of removing the barrier member ~~(20)~~ from between the resilient member ~~(51)~~ and the formation ~~(18)~~, thereby permitting the resilient member ~~(51)~~ to engage the formation ~~(18)~~ and preventing further operation of the device.

2. A medicament delivery device as claimed in Claim 1, which is an inhaler.

3. A medicament delivery device as claimed in Claim 2, which is a dry powder inhaler.

4. A medicament delivery device as claimed in any preceding claim, which comprises a reservoir in which a bulk quantity of medicament is held, the unit doses being dispensed as aliquots from that bulk quantity.

5. A medicament delivery device as claimed in any preceding claim, which dispenses unit doses of a single medicament.

6. A medicament delivery device as claimed in any one of Claims 1 to 4, which dispenses unit doses of a formulation containing two or more medicaments.

7. A medicament delivery device as claimed in any one of Claims 1 to 4, which dispenses unit doses of two or more medicaments from separate reservoirs within the device, those unit doses then being administered to the patient simultaneously.

8. A medicament delivery device as claimed in any preceding claim, wherein the arm has a projection ~~(51a)~~ that in the course of its reciprocating action is brought into registration with the formation ~~(18)~~, which is a recess or opening in an adjacent component of the device.

9. A medicament delivery device as claimed in any preceding claim, wherein the dose counting mechanism has indicia showing the number of doses dispensed or remaining carried on an element that is displaced upon each actuation.

10. A medicament delivery device as claimed in Claim 9, wherein the element constitutes the barrier element.

11. A medicament delivery device as claimed in any preceding claim, in which the dose counting mechanism comprises a tape ~~(20)~~ that carries indicia showing the number of doses dispensed or remaining.

12. A medicament delivery device as claimed in Claim 11, wherein the tape ~~(20)~~ is wound on a take-up spool ~~(40)~~ and is indexed upon each actuation of the device.

13. A medicament delivery device as claimed in Claim 11 or Claim 12, wherein the tape ~~(20)~~ passes between the resilient member ~~(51)~~ and the formation ~~(18)~~ during at least part of the actuation process, and thereby prevents engagement of the resilient member with the formation.

14. A medicament delivery device as claimed in any one of Claims 11 to 13, wherein the tape ~~(20)~~ has an opening ~~(21)~~ that is brought into registration with the formation ~~(18)~~ upon dispensing of the last of the predetermined doses, thereby removing the barrier between the formation and the resilient member ~~(51)~~ and allowing the formation and the resilient member to engage.

15. A medicament delivery device as claimed in any one of Claims 11 to 13, wherein the tape has one or more slits ~~(21)~~ formed in it, such that the resilient member is able to penetrate the tape in the region of the slit(s).

16. A medicament delivery device as claimed in Claim 15, wherein the tape is formed with an axial slit ~~(21a)~~ that is intersected by one or more transverse slits ~~(21b)~~.

17. A medicament delivery device as claimed in any preceding claim, wherein the resilient member engages the formation when the actuator is in its depressed position.

18. 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.

19. 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.