

CLAIMS

1. An inhaler device comprising;
an actuation mechanism having;
an indexing system for advancing a medicament carrier comprising a base with a plurality of medicament pockets or blisters and a peelable lidding sheet covering the blisters;
an opening system for peeling the lidding sheet from the medicament carrier to open a blister, wherein the opening system peels the lidding sheet from the medicament carrier to completely open a blister;
a lidding sheet take-up component for receiving used lidding sheet peeled from a medicament carrier; and
a common actuator for the indexing system and the opening system, wherein the common actuator is movable between a first position and a second position via an intermediate position; and
wherein progression of the opening system is disproportional to progression of the indexing system during movement of the common actuator.
2. An inhaler device according to claim 1, wherein movement of the common actuator through a first range of motion results in operation of the indexing system and movement of the common actuator through a second range of motion results in operation the opening system, and wherein the indexing system is dissociated from the opening system so that said first range of motion is not the same as said second range of motion.
3. An inhaler device according to claim 1, wherein a defined movement of the common actuator operates both the indexing system and the opening system, and wherein the speed of movement of the opening system relative to the speed of movement of the actuator varies during said defined movement of the actuator.
4. An inhaler device according to claim 1, wherein a defined movement of the common actuator results in operation of the indexing system to advance one dose of medicament and results in the opening system moving through a first phase of

operation in which said peeling occurs without exposing medicament in a blister and a second phase of operation in which medicament in a blister is exposed by said peeling, to thereby present a dose of medicament ready for inhalation, and wherein said second phase of operation of the opening system is delayed until said operation of the indexing system is 30% complete.

5. An inhaler device according to claim 3 or 4, wherein said defined movement comprises movement from said first position to said second position.
6. An inhaler device according to claim 3 or 4, wherein said defined movement comprises movement from said second position to said first position and back to said second position.
7. An inhaler device according to claim 1 or 2, wherein movement of the common actuator from said first position results in advancement the indexing system, and wherein only movement of the actuator beyond the intermediate position results in actuation of the opening system.
8. An inhaler device according to claim 7, wherein reverse movement of the actuator from a position between said first position and said intermediate position back to said first position results in reversing of said advancement of the indexing system.
9. An inhaler device according to any preceding claim, wherein movement of the actuator between the second position and the first position results in advancement of the indexing system.
10. An inhaler device according to any preceding claim, further comprising a central hub driven by the actuator.
11. An inhaler device according to claim 10, further comprising a gear linkage to transmit drive from the hub to the index system.

12. An inhaler device according to claim 10, further comprising a cam system to transmit drive from the hub to the index system.
13. An inhaler device according to any preceding claim, wherein the actuation mechanism further comprises a trigger component, and wherein movement of the trigger component triggers the opening system.
14. An inhaler device according to claim 13, wherein movement of the common actuator past the intermediate position results in movement of the trigger component.
15. An inhaler device according to any of claims 1 to 12, wherein the actuation mechanism further comprises a cam for controlling the opening system.
16. An inhaler device according to any preceding claim, wherein the actuation mechanism further comprises a drivetrain between the common actuator and the lidding sheet take-up component.
17. An inhaler device according to claim 16, wherein the actuation mechanism comprises means for regulating tension generated in lidding sheet during advancing of the indexing system.
18. An inhaler device according to claim 16 or 17, wherein a torsion spring is provided between two rotating components provided on a common centre, in the drivetrain.
19. An inhaler device according to claim 18, wherein the torsion spring is charged due to tension in the used lidding sheet during advancing of the indexing system.
20. An inhaler device according to any of claims 16 to 18, wherein the drivetrain moves the lidding sheet take-up component to regulate tension in the lidding sheet before or during advancing of the indexing system.

21. An inhaler device according to claim 20, wherein at least some of the peeled lidding sheet is turned back over an unopened section of a medicament carrier during advancing of the indexing system.
22. An inhaler device according to any preceding claim, further comprising a peel-beak component for regulating separation of a lidding sheet from a medicament carrier.
23. An inhaler device according to claim 22, wherein the peel-beak component is movable during or before advancement of the indexing system.
24. An inhaler device according to claim 23, wherein the peel-beak component follows a path substantially coincident with or offset from the path of a medicament carrier.
25. An inhaler device according to claim 23 or 24, wherein the peel-beak component selectively engages with a component of the indexing system.
26. An inhaler device according to claim 25, wherein the peel-beak component comprises a pawl or ratchet that selectively engages with said component of the indexing system.
27. An inhaler device according to any preceding claim, wherein the indexing system comprises means for indexing first and second medicament carriers each comprising a base with a plurality of medicament pockets or blisters and a peelable lidding sheet covering the blisters.
28. An inhaler device according to claim 27, wherein the opening system is configured for peeling the lidding sheet from each of the first and second medicament carriers, and wherein movement of the common actuator from said first position results in operation of the indexing system to advance the first medicament carrier, and wherein only movement of the actuator beyond the

intermediate position results in actuation of the opening system to peel the lidding sheet from a blister of the second medicament carrier.

29. An inhaler device according to claim 27 or 28, wherein the indexing system comprises separate first and second indexers for indexing said first and second medicament carriers.

30. An inhaler device according to claim 29, wherein the indexing system advances the first and second indexers such that the progression of the first indexer is disproportional to the progression of the second indexer.

31. An inhaler device comprising;
an actuation mechanism having;
an indexing system comprising first and second indexers for advancing first and second medicament carriers; and
a common actuator for the first and second indexers;
wherein the common actuator is movable between a first position and a second position via an intermediate position;
wherein progression of the first indexer is disproportional to progression of the second indexer,
wherein movement of the common actuator through a first range of motion results in operation of the first indexer and movement of the common actuator through a second range of motion results in operation the second indexer, and wherein the first indexer is dissociated from the second indexer so that said first range of motion is not the same as said second range of motion.

32. An inhaler device according to any of claim 29 to 31, wherein the first indexer and the second indexer are not advanced simultaneously during movement of the common actuator.

33. An inhaler device according to any of claims 29 to 32, wherein the indexing system advances one of the first and second indexers as the common actuator is moved from said second position to said first position.

34. An inhaler device according to any of claims 29 to 33, wherein at least one of the first and second indexers comprises an index wheel.
35. An inhaler device according to claim 27 or 28, wherein the indexing system comprises a single indexer.
36. An inhaler device according to claim 35, wherein the indexer comprises an index wheel.
37. An inhaler device according to any of claims 27 to 36, wherein the opening system is configured to simultaneously peel open a blister on each of said first and second medicament carriers.
38. An inhaler device according to any preceding claim, wherein said intermediate position of the common actuator is closer to said second position of the common actuator than to said first position of the common actuator.
39. An inhaler device according to claim 38, wherein said intermediate position of the common actuator is adjacent said second position of the common actuator.
40. An inhaler device according to any preceding claim, wherein the indexing system comprises one or more gears with intermittent drive and/or locking surfaces.
41. An inhaler device according to any preceding claim, wherein the indexing system comprises locking means for selectively preventing movement of one or more components of the indexing system.
42. An inhaler device according to claim 41, wherein the locking means comprises one or more gears with locking surfaces.

43. An inhaler device according to claim 41 or 42, wherein the locking means comprises one or more pawls.
44. An inhaler device according to any preceding claim, wherein the actuator comprises a mouthpiece cover.
45. An inhaler device according to claim 44, wherein the first position is a fully closed position of the mouthpiece cover.
46. An inhaler device according to claim 44 or 45, wherein the second position is a fully open position of the mouthpiece cover.
47. An inhaler device according to any preceding claim, further comprising a movable airway component.
48. An inhaler device according to claim 47, wherein the movable airway component comprises a unitary movable airway.
49. An inhaler device according to claim 47, wherein the inhaler comprises a split airway comprising a stationary airway component and the movable airway component.
50. An inhaler device according to any of claims 47 to 49, wherein the movable airway component provides a peel-beak component for regulating separation of a lidding sheet from a medicament carrier.
51. An inhaler device according to any of claims 47 to 50, wherein the movable airway component follows a path that is not substantially coincident with or merely offset from the path of a medicament carrier.
52. An inhaler device according to any of claims 47 to 51, wherein the movable airway component follows a substantially linear path.