

Claims

1. An injection device (1), in particular an autoinjector, which is configured for the simultaneous administration of at least two medications, and can be automatically
5 moved from a storage setting into an injection position, and wherein the injection device (1), which has a distal end section (3) that, in use, is directed towards a patient (2) and a proximal end section (4) that faces away therefrom, comprises:
- a carrying housing (5), said carrying housing (5) being configured in the form of a sleeve, and comprising a distal end (6) and a proximal end (7);
 - 10 an activation sleeve (8), said activation sleeve (8) surrounding a predominant part of a longitudinal extension of the carrying housing (5), starting from the proximal end (7) in the direction towards the distal end (6), and wherein the distal end (6) of the carrying housing (5) projects beyond the activation sleeve (8), and the activation sleeve (8) is moveable in relation to the carrying housing (5) in an axial direction;
 - 15 at least one carpule (9, 11), with a piston (10, 12) arranged therein that is adjustable in the axial direction, and with a medication received in the at least one carpule (9,11) for administration during the injection procedure, and wherein the at least one carpule (9,11) is received in the carrying housing (5);
 - a first drive module (13) with a first drive means (26), said first drive module
20 (13) being in drive connection with the at least one carpule (9, 11), and wherein the first drive module (13) is activatable by means of the activation sleeve (8);
 - a securing device (14), said securing device (14) securing the first drive module (13) in position relative to the carrying housing (5) until the activation of the first drive module for the injection procedure;
 - 25 a needle arrangement (17) with at least one cannula (15, 16), wherein, when in the storage setting of the injection device (1), the needle arrangement (17) is arranged in front of the at least one carpule (9, 11) in the distal end section (7), and in each case both ends (18, 19) of the least one cannula (15, 16) are arranged inside the carrying housing (5);
 - 30 a needle protection element (20), wherein, when in the storage setting of the injection device, the needle protection element (20) is moveable from a release position into a cover position, in which an end (18) of the at least one cannula (15, 16) is covered, and wherein said cannula end projects beyond the distal end (7) of the carrying housing (5) after the injection procedure;
 - 35 a second activatable drive module (21) with a second drive means (52), said second drive module (21) arranged to move the needle protection element (20) from a non-active position into the cover position; and

characterised in that at least two carpules (9, 11), when viewed in cross-section, the at least two carpules (9, 11) are arranged next to one another in the carrying housing (5);

wherein first drive module (13) further comprises a drive element (22), said
5 drive element (22) being arranged inside the carrying housing (5);

wherein drive element (22) comprises in each case a number of piston rods (23, 24) that is equal to the number of the carpules (9, 11), and wherein the piston rods (23, 24) forming a composite structural unit;

wherein at least one of the piston rods (23, 24) is configured in the form of a
10 hollow cylinder that is closed at a first end section (25) that faces towards the distal end section (3);

wherein the first drive means (26) is arranged in the hollow cylinder of the at least one piston rod (23, 24); and/or

wherein the first drive means (26) is arranged in an accommodation part (27)
15 of the drive element (22), such that, when viewed in cross-section, the drive element is arranged laterally next to the piston rods (23, 24), and wherein the accommodation part (27) forms a composite structural unit with the piston rods (23, 24).

2. Injection device (1) according to claim 1, characterised in that each of the at
20 least two carpules (9, 11) is arranged in each case in front of its own cannula (15, 16).

3. Injection device (1) according to claim 1 or 2, characterised in that the drive
element (22) comprises a connection part (28), that connects the piston rods (23, 24)
25 and the accommodation part (27) to one another at a second end region (29) thereof that faces towards the proximal end sections (4), and wherein the piston rods (23, 24) and the accommodation part (27) project from the connection part (28) in the distal direction.

30 4. Injection device (1) according to any one of the preceding claims, characterised in that the piston rods (23, 24) and the accommodation part (27) are in each case configured in the form of hollow cylinders, and in each case configured as closed at the end region (25) thereof that faces towards the distal end section (3).

35 5. Injection device (1) according to any one of the preceding claims, characterised in that only one of the pistons (10) of a first carpule of the at least two carpules (9) is coupled to the piston rod (23) allocated to the piston (10), and wherein

the other of the at least two carpules (11) is held by means of a holding device (30) to the first carpule (9).

5 6. Injection device (1) according to any one of claims 1 to 4, characterised in that each of the pistons (10, 12) is coupled to the piston rod (23, 24) allocated to it in each case, and the at least two carpules (9, 11) are held independently from one another on the drive element (22).

10 7. Injection device (1) according to any one of the preceding claims, characterised in that the carrying housing (5) comprises a front carrying housing part (31) with a front accommodation space (33) and a rear carrying housing part (32) with a rear accommodation space (34), and the two carrying housing parts (31, 32) can be connected to one another in a connection section (35) in the axial direction in two different longitudinal positions in a first connection setting and a second
15 connection setting.

8. Injection device (1) according to claim 7, characterised in that the two carrying housing parts (31, 32) can be connected to one another in the connection section (35) by means of a coupling device (36).
20

9. Injection device (1) according to claim 7 or 8, characterised in that the rear carrying housing part (32) comprises at least two guide extensions (37) that projects in the distal direction, said guide extensions (37) being supported by lying in contact on the front carrying housing part (31).
25

10. Injection device (1) according to any one of claims 7 to 9, characterised in that in the first connection setting the carrying housing parts (31, 32) exhibit a greater longitudinal extension in relation to the second connection setting.

30 11. Injection device (1) according to any one of claims 7 to 10, characterised in that the front carrying housing part (31) exhibits a longitudinal extension in the axial direction, which is selected in a value range with a lower limit of 60% and an upper limit of 95%, in particular with a lower limit of 70% and an upper limit of 85%, related to the total longitudinal extension of the two carrying housing parts (31) in the second
35 connection setting.

12. Injection device (1) according to any one of the preceding claims, characterised in that the distal end (7) of the carrying housing (5), in particular the distal end (7) of the front carrying housing part (31), comprises a number of openings (38) that is equal to the number of cannulas (15, 16), wherein said openings (38) allow for the through passage of the distal ends (18) of the cannulas (15, 16), and in each case a puncturable sealing plug (39) is arranged in the openings (38) in a sealing position.

13. Injection device (1) according to any one of the preceding claims, characterised in that a sealing element (40) is provided, said sealing element (40) being arranged between the front carrying housing part (31) and the rear carrying housing part (32), and is formed running continuously over the circumference.

14. Injection device (1) according to claim 13, characterised in that the sealing element (40) comprises at the distal end section that faces towards the front carrying housing part (31), a sealing attachment (41), wherein the first connection setting of the two carrying housing parts (31) said sealing attachment (41) is arranged at a distance from a face surface (42) of the front carrying housing part (31), and, in the second connection setting of the two carrying housing parts (31, 32), the sealing attachment (41) is in sealing contact at the face surface (42) of the front carrying housing part (31).

15. Injection device (1) according to claim 14, characterised in that the sealing attachment (41) of the sealing element (40) is supported on a face surface (43) of the rear carrying housing part (32), facing towards the front carrying housing part (31), and that the sealing element (40) extends into contact with the rear carrying housing part (32).

16. Injection device (1) according to any one of claims 13 to 15, characterised in that the sealing element (40), in the storage setting of the device and with the carrying housing parts (31, 32) being in the second connection setting, is in sealing contact over the full circumference both on the rear carrying housing part (32) and the drive element (22) arranged inside the housing part, in particular with its connection part (28) of the first drive module (13).

17. Injection device (1) according to any one of the preceding claims, characterised in that the carrying housing (5), in particular the rear carrying housing

part (32), comprises at its distal end a transverse wall (46), with a latch engagement cut-out opening (47) arranged in it.

18. Injection device (1) according to any one of the preceding claims,
5 characterised in that the securing device (14) comprises at least one retention hook (44), said at least one retention hook (44) being arranged on the drive element (22), in particular the connection part (28) thereof and wherein, in the storage setting of the device, the at least one retention hook (44) is held in the latch engagement cut-out opening (47) of the transverse wall (46).

10

19. Injection device (1) according to any one of the preceding claims,
characterised in that the securing device (14) comprises a securing cap (48) with a securing pin (49), arranged in the distal end section (3), and wherein by means of the securing pin (49) the at least one retention hook (44) is held in a latch engaged
15 setting when in the storage setting of the device.

20. Injection device (1) according to any one of the preceding claims,
characterised in that the proximal end region of the activation sleeve (8) comprises a closure wall (50), at which closure wall (50) a triggering means (51) is arranged, in
20 particular a triggering opening, said triggering means (51) aligned in the axial direction flush in relation to the latch engagement cut-out opening (47) arranged in the transverse wall (46) of the carrying housing (5), in particular of the rear carrying housing part (32).

21. Injection device (1) according to any one of the preceding claims,
characterised in that the second drive means (52) of the second drive module (21) is arranged outside the carrying housing (5), in particular outside the two carrying housing parts (31, 32) but inside the activation sleeve (8).

22. Injection device (1) according to any one of the preceding claims,
characterised in that the second drive means (52) of the second drive module (21) extends in the axial direction between the needle protection element (20) and the proximal end of the carrying end of the carrying housing (5), in particular of the rear carrying housing part (32).

35

23. Injection device (1) according to any one of the preceding claims, characterised in that the first drive means (26) and/or the second drive means (52) are respectively formed by a pressure spring, configured as a helical spring.

5 24. Injection device (1) according to any one of the preceding claims, characterised in that the second drive means (52) is arranged on the side of the piston rods (23) which when viewed in cross-section, is opposite the accommodation part (27) of the drive element (22).

10 25. Injection device (1) according to any one of the preceding claims, characterised in that the longitudinal extension of the second drive means (52) is guided at least in part by guide elements (53), wherein the guide elements (53) are arranged on an outer side of the carrying housing (5), in particular of the front carrying housing part (31).

15 26. Injection device (1) according to any one of the preceding claims, characterised in that the needle protection element (20), in its cover setting in relation to the carrying housing (5), is held locked in the proximal direction as well as in the axial direction.

20 27. Injection device (1) according to any one of the preceding claims, characterised in that, the simultaneous release takes place of both the first drive module (13) as well as of the second drive module (21) with the axial displacement of the activation sleeve (8) relative to the carrying housing (5).

25