

WE CLAIM:

1. A plunger for use with a syringe, the plunger comprising:
a plunger body having a proximal end, a distal end, and a circumferential sidewall extending between the proximal end and the distal end along a plunger longitudinal axis;
at least one resiliently deflectable retaining member having a first segment attached to an inner surface at the proximal end of the plunger body and a second segment protruding from the first segment toward the distal end of the plunger body and deflectable relative to the first segment along the longitudinal axis; and
at least one actuation member associated with the at least one resiliently deflectable retaining member, wherein the at least one actuation member comprises at least one cam member provided on a surface of the at least one resiliently deflectable retaining member,
wherein the at least one cam member of the at least one actuation member interacts with a piston used to engage the plunger to deflect the at least one resiliently deflectable retaining member upon rotation of the plunger relative to the piston during disengagement of the plunger from the piston.
2. The plunger according to claim 1, further comprising at least one alignment member associated with the plunger body or the at least one resiliently deflectable retaining member, the at least one alignment member having an alignment surface for guiding the piston into self-orienting alignment with the plunger during engagement of the plunger with the piston.
3. The plunger according to claim 2, wherein the at least one alignment member comprises a plurality of alignment members spaced apart around the plunger longitudinal axis.
4. The plunger according to claim 3, wherein the plurality of alignment members are spaced apart at equal radial intervals around the plunger longitudinal axis.
5. The plunger according to claim 1, wherein the second segment of the at least one resiliently deflectable retaining member is deflectable radially relative to the first segment away from the plunger longitudinal axis.

6. The plunger according to claim 1, wherein the at least one resiliently deflectable retaining member is linearly or curvilinearly contiguous between the first segment and the second segment.
7. The plunger according to claim 1, wherein the second segment of the at least one resiliently deflectable retaining member is angled toward the plunger longitudinal axis.
8. The plunger according to claim 1, wherein the at least one actuation member is at the second segment of the at least one resiliently deflectable retaining member.
9. The plunger according to claim 1, wherein the at least one actuation member is angled relative to a plane defined by a body of the at least one resiliently deflectable retaining member.
10. The plunger according to claim 1, wherein the at least one resiliently deflectable retaining member comprises a plurality of resiliently deflectable retaining members spaced apart around the plunger longitudinal axis.
11. The plunger according to claim 10, wherein the plurality of resiliently deflectable retaining members is spaced apart at equal radial intervals around the plunger longitudinal axis.
12. The plunger according to claim 1, wherein a terminal surface of the second segment of the at least one resiliently deflectable retaining member engages a surface of the piston to releasably lock the plunger with the piston.
13. The plunger according to claim 12, wherein the terminal surface is linear.
14. The plunger according to claim 12, wherein the terminal surface is perpendicular or angled relative to a direction of the plunger longitudinal axis.

15. The plunger according to claim 1, wherein the plunger body defines an interior cavity with a conical-shaped portion at the distal end of the plunger body and a cylindrical-shaped portion at the proximal end of the plunger body.

16. The plunger according to claim 1, wherein the at least one resiliently deflectable retaining member protrudes from the inner surface of the plunger body into the interior cavity.

17. The plunger according to claim 1, further comprising a plunger cover disposed over at least a portion of an outer surface of the plunger body, the plunger cover comprising a resilient seal disposed around at least a portion of a circumferential sidewall of the plunger cover.

18. The plunger according to claim 17, wherein the resilient seal comprises an inner surface at least partially seated in a groove in the circumferential sidewall of the plunger body and an outer surface adapted to slidably engage with a barrel of a syringe.

19. A plunger for use with a syringe, the plunger comprising:

- at a plunger body having a proximal end, a distal end, and a circumferential sidewall extending between the proximal end and the distal end along a plunger longitudinal axis;

- at least one resiliently deflectable retaining member having a first segment attached to an inner surface at the proximal end of the plunger body and a second end protruding from the first segment toward the distal end of the plunger body and deflectable relative to the first segment along the longitudinal axis;

- at least one actuation member comprising at least one cam member provided on a surface of the at least one resiliently deflectable retaining member, and

- at least one alignment member associated with the plunger body or the at least one resiliently deflectable retaining member,

- wherein the at least one alignment member guides a piston into self-orienting alignment with the plunger during engagement of the plunger with the piston.

20. The plunger according to claim 19, further comprising at least one actuation member associated with the at least one resiliently deflectable retaining member, wherein the at least

one actuation member interacts with the piston to deflect the at least one resiliently deflectable retaining member upon rotation of the plunger relative to the piston during disengagement of the plunger from the piston.

21. The plunger according to claim 20, wherein a terminal surface of the second segment of the at least one resiliently deflectable retaining member engages a surface of the piston to releasably lock the plunger with the piston.

22. The plunger according to claim 20, wherein the at least one actuation member is at the second segment of the at least one resiliently deflectable retaining member.

23. The plunger according to claim 20, wherein the second segment of the at least one resiliently deflectable retaining member is deflectable radially relative to the first segment away from the plunger longitudinal axis.

24. A plunger for use with a syringe, the plunger comprising:

- a plunger body having a proximal end, a distal end, and a circumferential sidewall extending between the proximal end and the distal end along a plunger longitudinal axis;

- at least one resiliently deflectable retaining member having a first segment attached to an inner surface at the proximal end of the plunger body and a second segment protruding from the first segment toward the distal end of the plunger body and deflectable relative to the first segment along the longitudinal axis;

- at least one alignment member associated with the plunger body or the at least one resiliently deflectable retaining member; and

- at least one actuation member associated with the at least one resiliently deflectable retaining member, wherein the at least one actuation member comprises at least one cam member provided on a surface of the at least one resiliently deflectable retaining member,

- wherein the at least one alignment member guides a piston into self-orienting alignment with the plunger during engagement of the plunger with the piston, and

- wherein the at least one cam member of the at least one actuation member interacts with the piston to deflect the at least one resiliently deflectable retaining member upon rotation of the plunger relative to the piston during disengagement of the plunger from the piston.

25. The plunger according to claim 24, wherein the second segment of the at least one resiliently deflectable retaining member protrudes towards the distal end of the plunger body and wherein the second end of the at least one resiliently deflectable retaining member is deflectable radially relative to the first segment away from the plunger longitudinal axis.

26. The plunger according to claim 24, wherein the second segment of the at least one resiliently deflectable retaining member protrudes in a direction circumferentially around the longitudinal axis of the plunger body and wherein the second end of the at least one resiliently deflectable retaining member is deflectable circumferentially relative to the first segment.

27. A syringe comprising:

a barrel having a barrel proximal end, a barrel distal end having a discharge nozzle, and a barrel sidewall extending between the barrel proximal end and the barrel distal end; and

a plunger slidably disposed within the barrel and reciprocally movable between the barrel proximal end and the barrel distal end, the plunger comprising:

a plunger body having a proximal end, a distal end, and a circumferential sidewall extending between the proximal end and the distal end along a plunger longitudinal axis;

at least one resiliently deflectable retaining member having a first segment attached to an inner surface at the proximal end of the plunger body and a second segment protruding from the first segment toward the distal end of the plunger body and deflectable relative to the first segment along the longitudinal axis; and

at least one actuation member associated with the at least one resiliently deflectable retaining member, wherein the at least one actuation member comprises at least one cam member provided on a surface of the at least one resiliently deflectable retaining member,

wherein the at least one cam member of the at least one actuation member interacts with a piston used to engage the plunger to radially deflect the at least one resiliently deflectable retaining member upon rotation of the plunger relative to the piston during disengagement of the plunger from the piston.