CLAIMS

1. A toner container (32Y, 32M, 32C, 32K) that is detachably attached to a main body of an image forming apparatus (100) such that a longitudinal direction of the toner container (32Y, 32M, 32C, 32K) is parallel to a horizontal direction, the toner container (32Y, 32M, 32C, 32K) comprising:

a cylindrical container body (33Y, 33M, 33C, 33K) that has an opening (A, 33a) on one end thereof in the longitudinal direction, and is configured to convey toner contained therein toward the opening (A, 33a);

a cap portion (34Y, 34M, 34C, 34K) into which the opening (A, 33a) of the container body is inserted, and which includes a toner outlet (W) at a bottom portion thereof for discharging toner, which has been discharged from the opening (A, 33a) of the container body, to the outside of the toner container (32Y, 32M, 32C, 32K) in a vertically downward direction; and

a shutter member (34d) that is held on the bottom portion of the cap portion (34Y, 34M, 34C, 34K), and moves along an outer periphery of the cap portion (34Y, 34M, 34C, 34K) to thereby open and close the toner outlet (W), wherein

the cap portion (34Y, 34M, 34C, 34K) is formed by integral molding.

2. The toner container (32Y, 32M, 32C, 32K) according to claim 1, wherein

the cap portion (34Y, 34M, 34C, 34K) includes

a plurality of claw members (34g2) that engages with the container body to rotatably hold the container body; and

a plurality of mold-processing holes (34j1, 34j3) arranged near the respective claw members (34g2) for forming the claw members (34g2), wherein

each of the claw members (34g2) and the mold-processing holes (34j1, 34j3) does not overlap any other portions formed on the cap portion (34Y, 34M, 34C, 34K) when the cap portion (34Y, 34M, 34C, 34K) alone is viewed in a projection plane perpendicular to the longitudinal direction.

3. The toner container (32Y, 32M, 32C, 32K) according to claim 2, wherein

the cap portion (34Y, 34M, 34C, 34K) includes at least one of

the toner outlet (W);

an incompatibly-shaped portion (34g) for identifying a type of the toner container (32Y, 32M, 32C, 32K), the incompatibly-shaped portion (34g) extending in

the longitudinal direction in a convex shape or a concave shape at a position unique to the type on an outer circumferential surface of the cap portion (34Y, 34M, 34C, 34K);

a first hole that functions as a main guide for positioning the cap portion (34Y, 34M, 34C, 34K) with respect to the image forming apparatus (100) and a second hole that functions as a sub guide for positioning the cap portion (34Y, 34M, 34C, 34K) with respect to the image forming apparatus (100), each of the first hole and the second hole extending in the longitudinal direction from an end face of the cap portion (34Y, 34M, 34C, 34K) perpendicular to the longitudinal direction; and

a pressed portion (34c) that protrudes on the outer circumferential surface of the cap portion (34Y, 34M, 34C, 34K), and is pressed in a direction of reaction to a force in an attachment direction when the cap portion (34Y, 34M, 34C, 34K) is attached to the main body of the image forming apparatus (100).

4. The toner container (32Y, 32M, 32C, 32K) according to claim 2, wherein

the container body includes a spiral-shaped projection on an inner circumferential surface thereof, and is held so as to rotate relative to the cap portion (34Y, 34M, 34C,

34K), and

a ring-shaped seal member (36, 37, 40Y, 76, 501), for sealing a gap between the cap portion (34Y, 34M, 34C, 34K) and the container body, is attached to a portion of the cap portion (34Y, 34M, 34C, 34K) so as to be provided at an opposed position to a circumference of the opening (A, 33a) of the container body.

5. The toner container (32Y, 32M, 32C, 32K) according to claim 4, wherein

the cap portion (34Y, 34M, 34C, 34K) includes a recess (34v1) formed on an attachment surface, to which the seal member is attached, for separating the seal member from the cap portion (34Y, 34M, 34C, 34K).

6. The toner container (32Y, 32M, 32C, 32K) according to claim 5, wherein

the recess (34v1) is formed at a position that corresponds to an inner circumferential surface side of the seal member and that is other than a region where the seal member comes into contact with the container body.

7. The toner container (32Y, 32M, 32C, 32K) according to claim 5, wherein

the cap portion (34Y, 34M, 34C, 34K) includes an

insertion port for inserting a bar-shaped jig for separating the seal member from the cap portion (34Y, 34M, 34C, 34K), the insertion port being formed on an outer circumferential surface of the cap portion (34Y, 34M, 34C, 34K) and at a position of facing a position of the recess (34v1).

8. The tone container according to claim 7, wherein

the cap portion (34Y, 34M, 34C, 34K) includes a concave portion that is formed in a portion of the insertion port, the concave portion being used as a pivot point of the jig.

9. The toner container (32Y, 32M, 32C, 32K) according to claim 4, wherein

a film member (37a) is attached to a surface of the seal member, the surface being attached to the cap portion (34Y, 34M, 34C, 34K).

10. The toner container (32Y, 32M, 32C, 32K) according to claim 1, wherein

the cap portion (34Y, 34M, 34C, 34K) includes

a cylindrical cavity (B) that is formed inside of the cap portion (34Y, 34M, 34C, 34K) and extends in the longitudinal direction; and

a toner fall path (C) that has a columnar shape with a constant flow passage area from a lower circumferential surface of the cavity to the toner outlet (W).

11. An image forming apparatus (100) comprising:

the toner container (32Y, 32M, 32C, 32K) according to claim 1 that is set in a main body of the image forming apparatus (100).

12. The toner container (32Y, 32M, 32C, 32K) according to claim 1, wherein

the cap portion (34Y, 34M, 34C, 34K) includes a plurality of claw members (34g2) engaged with the container body, and

at least the claw members (34g2) and a portion of the cap portion (34Y, 34M, 34C, 34K), the portion being at an opposed position to a circumference of the opening (A, 33a) of the container body, are formed by integral molding.

CLAIMS

1. A toner container that is detachably attached to a main body of an image forming apparatus such that a longitudinal direction of the toner container is parallel to a horizontal direction, the toner container comprising:

a cylindrical container body that has an opening on one end thereof in the longitudinal direction, and is configured to convey toner contained therein toward the opening;

a cap portion into which the opening of the container body is inserted, and which includes a toner outlet at a bottom portion thereof for discharging toner, which has been discharged from the opening of the container body, to the outside of the toner container in a vertically downward direction; and

a shutter member that is held on the bottom portion of the cap portion, and moves along an outer periphery of the cap portion to thereby open and close the toner outlet, wherein

the cap portion is formed by integral molding, wherein

the cap portion includes

a plurality of claw members that engage with the container body to rotatably hold the container body; and

a plurality of mold-processing holes arranged near the respective claw members for forming the claw members, wherein

each of the claw members and the mold-processing holes does not overlap any other portions than the claw members and the mold-processing holes formed on the cap portion when the cap portion alone is viewed in the longitudinal direction on a projection plane perpendicular to the longitudinal direction.

2. The toner container according to claim 1, wherein

the cap portion includes at least one of

the toner outlet;

an incompatibly-shaped portion for identifying a type of the toner container, the incompatibly-shaped portion extending in the longitudinal direction in a convex shape or a concave shape at a position unique to the type on an outer circumferential surface of the cap portion;

a first hole that functions as a main guide for positioning the cap portion with respect to the image forming apparatus and a second hole that functions as a sub guide for positioning the cap portion with respect to the image forming apparatus, each of the first hole and the second hole extending in the longitudinal direction from an end face of the cap portion perpendicular to the longitudinal direction; and

a pressed portion that protrudes on the outer circumferential surface of the cap portion, and is pressed in a direction of reaction to a force in an attachment direction when the cap portion is attached to the main body of the image forming apparatus.

3. The toner container according to claim 1 or claim 2, wherein

the container body includes a spiral-shaped projection on an inner circumferential surface thereof, and is held so as to rotate relative to the cap portion, and

a ring-shaped seal member, for sealing a gap between the cap portion and the container body, is attached to a portion of the cap portion so as to be provided at an opposed position to a circumference of the opening of the container body.

4. The toner container according to claim 3, wherein

the cap portion includes a recess formed on an attachment surface, to which the seal member is attached, for separating the seal member from the cap portion.

5. The toner container according to claim 4, wherein

the recess is formed at a position that corresponds to an inner circumferential surface

side of the seal member and that is other than a region where the seal member comes into contact with the container body.

6. The toner container according to claim 4 or claim 5, wherein

the cap portion includes an insertion port for inserting a bar-shaped jig for separating the seal member from the cap portion, the insertion port being formed on an outer circumferential surface of the cap portion and at a position of facing a position of the recess.

7. The tone container according to claim 6, wherein

the cap portion includes a concave portion that is formed in a portion of the insertion port, the concave portion being used as a pivot point of the jig.

8. The toner container according to any one of claims 3 to 7, wherein

a film member is attached to a surface of the seal member, the surface being attached to the cap portion.

9. The toner container according to any one of the preceding claims, wherein

the cap portion includes

a cylindrical cavity that is formed inside of the cap portion and extends in the longitudinal direction; and

a toner fall path that has a columnar shape with a constant flow passage area from a lower circumferential surface of the cavity to the toner outlet.

10. An image forming apparatus comprising:

the toner container according to any one of the preceding claims that is set in a main body of the image forming apparatus.

11. A toner container that is detachably attached to a main body of an image forming apparatus such that a longitudinal direction of the toner container is parallel to a horizontal direction, the toner container comprising:

a cylindrical container body that has an opening on one end thereof in the longitudinal direction, and is configured to convey toner contained therein toward the opening;

a cap portion into which the opening of the container body is inserted, and which includes a toner outlet at a bottom portion thereof for discharging toner, which has been discharged from the opening of the container body, to the outside of the toner container in a vertically downward direction; and

a shutter member that is held on the bottom portion of the cap portion, and moves along an outer periphery of the cap portion to thereby open and close the toner outlet, wherein

the cap portion includes a plurality of claw members engaged with the container body, and

at least the claw members and a portion of the cap portion, the portion being at an opposed position to a circumference of the opening of the container body, are formed by integral molding,

wherein the cap portion includes a plurality of mold-processing holes arranged near the respective claw members for forming the claw members, wherein each of the claw members and the mold-processing holes does not overlap any other portions than the claw members and the mold-processing holes formed on the cap portion when the cap portion alone is viewed in the longitudinal direction on a projection plane perpendicular to the longitudinal direction.

12. A toner container substantially as herein described with reference to Figures 3 to 23, 25 to 28, 47 to 65 and 68 to 69.

13. An image forming apparatus substantially as herein described with reference to Figures 1, 68 to 70 and 80 to 84.