Claims

1. A toner container which is detachably disposed in a body of an image forming apparatus with a longitudinal direction of the toner container held in a horizontal direction, the toner container comprising:

a toner outlet arranged to discharge toner in a downward vertical direction outside the toner container; and

a shutter member arranged to open and close the toner outlet, the shutter member comprising a shutter which opens and closes the toner outlet when the shutter is engaged with rail parts provided in the toner container and moves along with the rail parts,

the rail parts including:

a first rail part disposed at an upstream portion in an insertion direction of the toner container to extend in the longitudinal direction; and

a second rail part disposed at a downstream portion in the insertion direction of the toner container to extend in the longitudinal direction;

wherein a longitudinal length of the first rail part in the longitudinal direction is smaller than a longitudinal length of the second rail part in the longitudinal direction.

2. The toner container according to claim 1, wherein a distance between a portion of the shutter supported by the first rail part and a portion of the shutter supported by the second rail part is reduced when the shutter member moves to open the toner outlet.

3. The toner container according to claim 1, wherein:

the shutter member comprises a shutter deforming part which is formed integrally with the shutter to be elastically deformable in a vertical direction from a connection position where the shutter deforming part is connected to the shutter, and

the shutter deforming part comprises:

a stopper part arranged to regulate movement of the shutter member in a direction from a closed state in which the stopper part contacts a contact part formed in the toner container and the shutter closes the toner outlet to an open state in which the shutter opens the toner outlet; and

a stopper release part arranged to project downward in the vertical direction and adapted to cancel a contact state in which the stopper part contacts the contact part by displacing the stopper part upward by elastic deformation of the shutter deforming part to an upper position which deformation is caused when an external force from a lower position is received at the stopper release part.

4. The toner container according to claim 3, further comprising an accommodation part which is arranged to hold the shutter deforming part in an elastically deformed state when the shutter member opens the toner outlet, and to accommodate the shutter deforming part therein,

wherein, when the shutter member fully opens the toner outlet, the portion of the shutter supported by the second rail part is separated from the second rail part and the shutter is supported by the first rail part only.

5. The toner container according to claim 1, further comprising:

a cylindrical main part which is arranged to include an opening formed at one end in the longitudinal direction so that toner contained in the toner container is delivered to the opening; and

a cap part which is arranged to accommodate the opening of the main part therein and to include a bottom formed into the toner outlet for discharging the toner from the opening of the main part downward in the vertical direction outside the toner container.

6. The toner container according to claim 1, wherein toner is contained in the toner container.

7. The toner container according to claim 1, wherein the first rail part is formed into a groove.

8. The toner container according to claim 1, wherein the second rail part is formed into a groove which is interposed between a rib projecting from the toner container and a vertical surface projecting sideward from a side of a shutter main part.

9. The toner container according to claim 1, wherein the shutter comprises:

first projections projecting sidewise from sides of a shutter main part; and

second projections projecting inward of the sides of the shutter

main part,

wherein the first projections are engaged with the first rail part and the second projections are engaged with the second rail part.

10. An image forming apparatus in which the toner container according to claim 1 is arranged in the body of the image forming apparatus.

Claims

1. A toner container for use with an image forming apparatus, the toner container comprising:

a toner outlet to discharge toner in a downward direction outside the toner container, when the toner container is mounted to the image forming apparatus such that a length of the toner container is oriented in a horizontal direction; and

a shutter to open and close the toner outlet, the shutter comprising a shutter main part which opens and closes the toner outlet when the shutter is engaged with and moves along rails of the toner container,

the rails comprising:

a first rail disposed at an upstream portion in an insertion direction of the toner container; and

a second rail disposed at a downstream portion in the insertion direction of the toner container, the shutter contacting two surfaces of the second rail which are on opposite sides of the second rail,

wherein the first and second rails are parallel to the length of the toner container, and a longitudinal length of the first rail is smaller than a longitudinal length of the second rail.

2. The toner container according to claim 1, wherein a distance between a portion of the shutter supported by the first rail part and a portion of the shutter supported by the second rail part is reduced when the shutter member moves to open the toner outlet.

3. The toner container according to claim 1, wherein:

the shutter comprises a shutter deforming part which is formed integrally with the shutter and is elastically deformable in a vertical direction from a connection position where the shutter deforming part is connected to the shutter, and

the shutter deforming part comprises:

a stopper arranged to regulate movement of the shutter in a direction from a closed state in which the stopper contacts a contact part of the toner container and the shutter closes the toner outlet, to an open state in which the shutter opens the toner outlet; and

a stopper release which projects downwardly in the vertical direction and is to cancel a contact state in which the stopper part contacts the contact part by displacing the stopper part upwardly by elastic deformation of the shutter deforming part to an upper position which deformation is caused when an external force from a lower position is received at the stopper release part.

4. The toner container according to claim 3, further comprising an accommodation part to hold the shutter deforming part in an elastically deformed state when the shutter opens the toner outlet, and to accommodate the shutter deforming part therein,

wherein, when the shutter fully opens the toner outlet, a portion of the shutter supported by the second rail is separated from the second rail; the shutter is supported by the first rail without being supported by the second rail.

5. The toner container according to claim 1, further comprising:

a cylindrical main part which includes an opening at one end of a length of the cylindrical main part so that toner contained in the toner container is delivered to the opening; and

a cap arranged to accommodate the opening of the cylindrical main part therein and including a bottom of the toner outlet for discharging the toner from the opening of the main part downward in a vertical direction outside the toner container.

6. The toner container according to claim 1, further comprising toner within the toner container.

7. The toner container according to claim 1, wherein the first rail comprises a groove.

8. The toner container according to claim 1, wherein the second rail comprises a groove which is interposed between a rib projecting from the toner container and a vertical surface projecting sideward from a side of the shutter main part.

9. The toner container according to claim 1, wherein the shutter comprises:

first projections projecting sidewise from sides of the shutter main part; and

second projections projecting inwardly of the sides of the shutter

main part,

wherein the first projections are engaged with the first rail and the second projections are engaged with the second rail.

10. An image forming apparatus comprising the toner container according to claim 1 within a body of the image forming apparatus.

11. A toner container for use with an image forming apparatus, the toner container comprising:

a toner outlet to discharge toner in a downward direction outside the toner container, when the toner container is mounted to the image forming apparatus such that a length of the toner container is oriented in a horizontal direction; and

a shutter to open and close the toner outlet, the shutter comprising a shutter part which opens and closes the toner outlet when the shutter is engaged with and moves along rails of the toner container,

the rails comprising:

a first rail disposed at an upstream portion in an insertion direction of the toner container; and

a second rail disposed at a downstream portion in the insertion direction of the toner container,

wherein the first and second rails are parallel to the length of the toner container, and a longitudinal length of the first rail is smaller than a longitudinal length of the second rail, and

wherein the first rail comprises a groove.

12. The toner container according to claim 11, wherein a distance between a portion of the shutter supported by the first rail part and a portion of the shutter supported by the second rail part is reduced when the shutter member moves to open the toner outlet.

13. The toner container according to claim 11, wherein:

the shutter comprises a shutter deforming part which is formed integrally with the shutter and is elastically deformable in a vertical direction from a connection position where the shutter deforming part is connected to the shutter, and

the shutter deforming part comprises:

a stopper arranged to regulate movement of the shutter in a direction from a closed state in which the stopper contacts a contact part of the toner container and the shutter closes the toner outlet, to an open state in which the shutter opens the toner outlet; and

a stopper release which projects downwardly in the vertical direction and is to cancel a contact state in which the stopper part contacts the contact part by displacing the stopper part upwardly by elastic deformation of the shutter deforming part to an upper position which deformation is caused when an external force from a lower position is received at the stopper release part.

14. The toner container according to claim 11, further comprising:

a cylindrical main part which includes an opening at one end of a length of the cylindrical main part so that toner contained in the toner container is delivered to the opening; and

a cap arranged to accommodate the opening of the cylindrical main part therein and including a bottom of the toner outlet for discharging the toner from the opening of the main part downward in a vertical direction outside the toner container.

15. The toner container according to claim 11, further comprising toner within the toner container.

16. An image forming apparatus comprising the toner container according to claim 11 within a body of the image forming apparatus.

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