CLAIMS

1. A powder container, removably attachable to an image forming apparatus and containing image forming powder, the powder container comprising:

a container opening in a first end;

a conveyor, arranged inside the powder container, to convey the powder from a second end of the powder container to the first end along a longitudinal direction of the powder container;

a nozzle receiver, arranged in the container opening and including a nozzle receiving opening to receive a powder conveying nozzle of the image forming apparatus, to guide the powder conveying nozzle to the inside of the powder container; and

a scooping portion, receiving the powder from the conveyor and rotating to scoop up the received powder from bottom to top in the powder container so as to move the powder to a powder receiving opening of the powder conveying nozzle, wherein

the nozzle receiver includes

a shutter to open and close the nozzle receiving opening;

a supporting portion to support the shutter so as to move;

an opening, arranged adjacent to the supporting portion, to communicate with the powder receiving opening of the conveying nozzle inserted in the nozzle receiver, wherein

the supporting portion and the opening arranged adjacent to the supporting portion are configured to alternately cross the powder receiving opening along with rotation of the nozzle receiver.

2. The powder container according to claim 1, wherein one of an inner rim of the opening arranged adjacent to the supporting portion and a combination of the inner rim and an outer surface of the supporting portion serves as a powder bridging that allows the powder to move from the scooping portion to the powder receiving opening.

3. The powder container according to claim 2, wherein the scooping portion and the powder bridging rotate in the same rotation direction and are arranged close to each other such that the inner rim of the opening arranged adjacent to the supporting portion and a convex that rises toward the inside of the powder container in the scooping portion are located in this order from downstream to upstream in the rotation direction.

4. The powder container according to claim 1, further comprising a container body to contain the powder, wherein

the container body is held by the powder conveying device so as to rotate relative to the powder conveying nozzle about a longitudinal direction of the container body as a rotation axis when the powder is conveyed,

the nozzle receiver is fixed to the container body, and

the scooping portion includes a convex that is an inner wall surface of the container body rising inward in the container body and includes an inner wall that rises from the convex to an inner wall surface of the container body.

5. The powder container according to claim 2, further comprising a container body to contain the powder, wherein

the container body is held by the powder conveying device so as to rotate relative to the powder conveying nozzle about a longitudinal direction of the container body as a rotation axis when the powder is conveyed,

the nozzle receiver is fixed to the container body,

the scooping portion includes a convex that is an inner wall surface of the container body rising inward in the container body and includes an inner wall that rises from the convex to an inner wall surface of the container body, and

the convex and the powder bridging are arranged in a contacted state or with a small gap interposed therebetween.

6. The powder container according to claim 1, wherein

the container body is held by the powder conveying device so as to rotate relative to the conveying nozzle about a longitudinal direction of the container body as a rotation axis when the powder is conveyed,

the nozzle receiver is fixed to the container body, and

the scooping portion includes a rib protruding from the nozzle receiver to a vicinity of an inner wall of the powder container.

7. An image forming apparatus comprising:

an image forming unit that forms an image on an image carrier by using image-forming powder;

a powder conveyor that conveys the powder to the image forming unit; and

the powder container according to any one of claims 1 to 6, wherein

the powder container is configured to be detachably attached to the image forming apparatus.

8. The powder container according to claim 6, wherein a surface of the rib is bent.

9. The powder container according to claim 1, further comprising a container body to contain the powder, wherein

the container body is held by the powder conveying device,

the nozzle receiver is held by the container body so as to rotate relative to the conveying nozzle about a longitudinal direction of the container body, and

the scooping portion includes a pair of ribs whose surfaces are bent.

10. The powder container according to any one of claims 6, 8 and 9, wherein the nozzle receiver is integrated with a conveying blade holder of the conveyor to which conveying blades are fixed.

11. The powder container according to any one of claims 6 and 8 to 10, wherein a container gear is fixed to the nozzle receiver.

12. The powder container according to any one of claims 6 and 8 to 11, wherein an outer surface of the nozzle receiver is rotatably fitted to an inner surface of a container setting section of the image forming apparatus.

13. The powder container according to any one of claims 1 to 6 and 8 to 12, wherein the powder container contains therein toner.

CLAIMS

1. A powder container, removably attachable to an image forming apparatus and containing image forming powder, the powder container comprising:

a container opening in a first end;

a conveyor, arranged inside the powder container, to convey the powder from a second end of the powder container to the first end along a longitudinal direction of the powder container;

a nozzle receiver, arranged in the container opening and including a nozzle receiving opening to receive a powder conveying nozzle of the image forming apparatus, to guide the powder conveying nozzle to the inside of the powder container; and

a scooping portion, receiving the powder from the conveyor and rotating to scoop up the received powder from bottom to top in the powder container so as to move the powder to a powder receiving opening of the powder conveying nozzle, wherein

the nozzle receiver includes

a shutter to open and close the nozzle receiving opening;

a supporting portion to support the shutter so as to move;

an opening, arranged adjacent to the supporting portion, to communicate with the powder receiving opening of the conveying nozzle inserted in the nozzle receiver, wherein

the supporting portion and the opening arranged adjacent to the supporting portion are configured to alternately cross the powder receiving opening along with

rotation of the nozzle receiver.

2. The powder container according to claim 1, wherein one of an inner rim of the opening arranged adjacent to the supporting portion and a combination of the inner rim and an outer surface of the supporting portion serves as a powder bridging that allows the powder to move from the scooping portion to the powder receiving opening.

3. The powder container according to claim 2, wherein the scooping portion and the powder bridging rotate in the same rotation direction and are arranged close to each other such that the inner rim of the opening arranged adjacent to the supporting portion and a convex that rises toward the inside of the powder container in the scooping portion are located in this order from downstream to upstream in the rotation direction.

4. The powder container according to claim 1, further comprising a container body to contain the powder, wherein

the container body is held by the powder conveying device so as to rotate relative to the powder conveying nozzle about a longitudinal direction of the container body as a rotation axis when the powder is conveyed,

the nozzle receiver is fixed to the container body, and

the scooping portion includes a convex that is an inner wall surface of the container body rising inward in the container body and includes an inner wall that rises from the convex to an inner wall surface of the container body.

5. The powder container according to claim 2, further

comprising a container body to contain the powder, wherein

the container body is held by the powder conveying device so as to rotate relative to the powder conveying nozzle about a longitudinal direction of the container body as a rotation axis when the powder is conveyed,

the nozzle receiver is fixed to the container body,

the scooping portion includes a convex that is an inner wall surface of the container body rising inward in the container body and includes an inner wall that rises from the convex to an inner wall surface of the container body, and

the convex and the powder bridging are arranged in a contacted state or with a small gap interposed therebetween.

6. The powder container according to claim 1, wherein the scooping portion includes a rib protruding from the nozzle receiver to a vicinity of an inner wall of the powder container.

7. An image forming apparatus comprising:

an image forming unit that forms an image on an image carrier by using image-forming powder;

a powder conveyor that conveys the powder to the image forming unit; and

the powder container according to any one of claims 1 to 6, wherein

the powder container is configured to be detachably attached to the image forming apparatus.