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CLAIMS

1. A powder container to contain powder used for forming an image and to be attached to an image forming apparatus that includes:

5 a conveying nozzle to convey the powder;

a powder receiving hole that is provided on the conveying nozzle and receives the powder from the powder container;

10 an apparatus main-body gear to transmit a driving force to the powder container; and

a container receiving section that is arranged around the conveying nozzle and receives the powder container, the powder container comprising:

15 an opening that is provided on one end of the powder container in a longitudinal direction;

a nozzle receiver that is arranged in the opening and receives the conveying nozzle;

a rotary conveyor that rotates to convey the powder to the powder receiving hole; and

20 a container gear that is provided near the opening and drives the conveyor by meshing with the apparatus main-body gear, wherein

25 the container gear is arranged so as to mesh with the apparatus main-body gear at a position closer to the opening than the powder receiving hole in the longitudinal direction, and

the opening is to mate with the container receiving section.

30 2. A powder container to contain powder used for forming an image and to be attached to an image forming apparatus, the powder container comprising:

~~an opening that is provided on one end of the powder~~

container in a longitudinal direction;

a nozzle receiver that is arranged in the opening and receives a conveying nozzle provided on a main body of the image forming apparatus;

5 a rotary conveyor to rotate to convey the powder to a powder receiving hole that is arranged on the conveying nozzle and receives the powder from the powder container; and

10 a container gear that is provided near the opening to drive the rotary conveyor by meshing with an apparatus main-body gear at a position closer to the opening than the powder receiving hole in the longitudinal direction, the apparatus main-body gear transmitting a driving force to the powder container, wherein

15 the opening is to mate with a container receiving section that is arranged around the conveying nozzle and that receives the powder container.

3. A powder container to contain powder used for forming
20 an image and to be attached to an image forming apparatus that includes:

a conveying nozzle to convey the powder;

25 a powder receiving hole that is provided on the conveying nozzle and receives the powder from the powder container;

an apparatus main-body gear to transmit a driving force to the powder container; and

30 a container receiving section that is arranged around the conveying nozzle and receives the powder container, the powder container comprising:

an opening that is provided on one end of the powder container in a longitudinal direction;

~~a nozzle receiver that is arranged in the opening and~~

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receives the conveying nozzle;

a rotary conveyor that rotates to convey the powder to the powder receiving hole; and

a container gear that is provided near the opening and drives the conveyor by meshing with the apparatus main-body gear, wherein

the container gear is arranged so as to mesh with the apparatus main-body gear at a position between the opening and the powder receiving hole in the longitudinal direction, and

the opening is to mate with the container receiving section.

4. The powder container according to any one of claims 1 to 3, further comprising;

a guiding portion to guide the opening to the container receiving section when the powder container is attached to the image forming apparatus, wherein

the guiding portion is one of a circumferential restrictor, a vertical restrictor, a radial restrictor, and a longitudinal restrictor.

5. The powder container according to claim 4, wherein the circumferential restrictor restricts movement of a container cover in a circumferential direction when the powder container is attached to the image forming apparatus.

6. The powder container according to claim 4 or 5, further comprising the container cover including a gear exposing opening to expose the container gear.

7. The powder container according to claim 5, wherein the guiding portion is provided on the container cover.

8. The powder container according to any one of claims 4 to 6, wherein the circumferential restrictor is a circumferential restricting portion that protrudes from an outer surface of the powder container, and is to enter a groove arranged on the image forming apparatus.

9. The powder container according to any one of claims 4 to 8, wherein the circumferential restrictor protrudes from an end of the vertical restrictor.

10. The powder container according to any one of claims 4 to 9, wherein the circumferential restrictor protrudes in a powder-container attachment direction from an end of the vertical restrictor on a downstream side in the powder-container attachment direction.

11. The powder container according to any one of claims 4 to 10, wherein the circumferential restrictor protrudes in a radially outward direction from an outer surface of the powder container.

12. The powder container according to any one of claims 4 to 7, wherein the circumferential restrictor is a circumferential restricting groove that is provided from an outer surface of the powder container toward an inside of the powder container and provided to fit a convex provided on the image forming apparatus.

13. The powder container according to any one of claims 4 to 12, wherein the vertical restrictor restricts movement of the powder container in a vertical direction when the powder container is attached to the image forming apparatus.

14. The powder container according to any one of claims 4 to 13, wherein the vertical restrictor restricts movement in a vertical direction by a guiding rail provided on the image forming apparatus when the powder container is attached to the image forming apparatus.

15. The powder container according to any one of claims 4 to 14, wherein
the vertical restrictor includes a sliding guide including an upper guide and a lower guide each extending in the longitudinal direction of the powder container, and the upper guide and the lower guide sandwich a guiding rail provided on the image forming apparatus to thereby restrict movement of the powder container in the vertical direction.

16. The powder container according to claim 15, wherein a clearance gap between the upper guide and the lower guide on a downstream side in the powder-container attachment direction is narrower than the clearance gap on an upstream side in the powder-container attachment direction.

17. The powder container according to any one of claims 4 to 16, wherein the vertical restrictor is an upward guide that protrudes upward from an outer surface of the powder container when the powder container is attached to the image forming apparatus, and comes in contact with a projection that is provided on the image forming apparatus so as to project downward.

18. The powder container according to any one of claims 4 to 17, wherein the radial restrictor restricts movement of

the powder container in a radial direction when the powder container is attached to the image forming apparatus.

19. The powder container according to claim 18, wherein
5 the radial restrictor is a protrusion that protrudes from an outer surface of the powder container and that comes in contact with an inner surface of a container holding section of the image forming apparatus to thereby restrict the movement of the powder container in the radial
10 direction.

20. The powder container according to claim 19, wherein the protrusion protruding from the outer surface of the powder container is provided at least on three positions on
15 a front end of the powder container in the powder-container attachment direction.

21. The powder container according to claim 19 or 20, wherein the protrusion protruding from the outer surface of
20 the powder container is provided at three evenly-spaced positions on a front end of the powder container in the powder-container attachment direction.

22. The powder container according to any one of claims 4
25 to 21, wherein the longitudinal restrictor restricts movement of the powder container in the longitudinal direction when the powder container is attached to the image forming apparatus.

30 23. The powder container according to claim 22, the longitudinal restrictor is an engaged opening provided on an outer surface of the powder container, and is engaged
~~with an engaging member provided on the image forming~~

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apparatus to thereby restrict the movement of the powder container in the longitudinal direction.

24. The powder container according to any one of claims 1 to 23, wherein an outer surface of the opening of the powder container and an inner surface of the container receiving section come in contact with each other to thereby determine a position of the powder container in a radial direction.

25. The powder container according to any one of claims 1 to 24, further comprising an information storage medium that is provided on a front end of the powder container on a downstream side in the powder-container attachment direction.

26. The powder container according to claim 25, wherein the information storage medium includes a positioning opening, and

a positioning pin arranged on the image forming apparatus is inserted in the terminal opening when the powder container is attached to the image forming apparatus to thereby determine a position of the information storage medium.

27. The powder container according to any one of claims 1 to 26, wherein

the powder includes toner, and
the powder container stores the toner.

28. The powder container according to claim 27, wherein the powder further includes carrier.

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29.. An image forming apparatus comprising:

the powder container according to any one of claims 1
to 28; and

an image forming unit that forms an image on an image
5 bearer by using the powder conveyed from the powder
container.

CLAIMS

1. A powder container to contain powder used for forming an image and to be attached to an image forming apparatus that includes:

5 a conveying nozzle to convey the powder;

a powder receiving hole of the conveying nozzle that receives the powder from the powder container;

an apparatus main-body gear to transmit a driving force to the powder container; and

10 a container receiving section that includes the conveying nozzle and receives the powder container,

the powder container comprising:

an opening that is at one end of the powder container in a longitudinal direction;

15 a nozzle receiver at the opening and receives the conveying nozzle;

a conveyor to convey the powder; and

a container gear to drive the conveyor by meshing with the apparatus main-body gear, wherein

20 the container gear is to mesh with the apparatus main-body gear at a position closer to the opening than the powder receiving hole in the longitudinal direction, and

the opening is to mate with the container receiving section.

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2. A powder container to contain powder used for forming an image and to be attached to an image forming apparatus, the powder container comprising:

30 an opening that is at one end of the powder container in a longitudinal direction;

a nozzle receiver in the opening to receive a conveying nozzle of a main body of the image forming apparatus;

a conveyor to convey the powder; and
 a container gear to drive the conveyor by meshing with
 an apparatus main-body gear at a position, in a
 longitudinal direction, closer to the opening than a powder
 5 receiving hole of the conveying nozzle that receives the
 powder from the powder container, the apparatus main-body
 gear transmitting a driving force to the powder container,
 wherein the opening is to mate with a container
 receiving section that includes the conveying nozzle and
 10 that receives the powder container.

3. A powder container to contain powder used
 for forming an image and to be attached to an image forming
 apparatus that includes:

15 a conveying nozzle to convey the powder;
 a powder receiving hole of the conveying nozzle that
 receives the powder from the powder container;
 an apparatus main-body gear to transmit a driving
 force to the powder container; and
 20 a container receiving section that includes the
 conveying nozzle and receives the powder container,
 the powder container comprising:
 an opening that is at one end of the powder container
 in a longitudinal direction;
 25 a nozzle receiver at the opening to receive the
 conveying nozzle;
 a conveyor to convey the powder; and
 a container gear to drive the conveyor by meshing with
 the apparatus main-body gear, wherein
 30 the container gear is to mesh with the apparatus main-
 body gear at a position between the opening and the powder
 receiving hole in the longitudinal direction, and
 the opening is to mate with the container receiving

section.

4. The powder container according to any one of claims 1 to 3, further comprising;

5 a guiding portion to guide the opening to the container receiving section when the powder container is attached to the image forming apparatus, wherein
the guiding portion is one of a circumferential restrictor, a vertical restrictor, a radial restrictor, and
10 a longitudinal restrictor.

5. The powder container according to claim 4, further comprising:

a container body that stores a powder; and
15 a container cover attached to an outer surface of the container body,
wherein the circumferential restrictor restricts movement of the container cover in a circumferential direction when the powder container is attached to the
20 image forming apparatus.

6. The powder container according to claim 4, further comprising a container cover including a gear exposing opening to expose the container gear.

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7. The powder container according to claim 5 or 6, wherein the guiding portion is on the container cover.

8. The powder container according to any one of
30 claims 4 to 7, wherein the circumferential restrictor is a circumferential restricting portion that protrudes from an outer surface of the powder container, and is to enter a groove at the image forming apparatus.

9. The powder container according to any one of claims 4 to 8, wherein the vertical restrictor is an upward guide that protrudes upward from an outer surface of the powder container when the powder container is attached to the image forming apparatus, and is to contact with a projection that is on the image forming apparatus so as to project downward.
10. The powder container according to any one of claims 4 to 8, wherein the circumferential restrictor protrudes from an end of the vertical restrictor.
11. The powder container according to any one of claims 4 to 8 and 10, wherein the circumferential restrictor protrudes in a powder-container attachment direction from an end of the vertical restrictor on a downstream side in the powder-container attachment direction.
12. The powder container according to any one of claims 4 to 8, 10 and 11, wherein the circumferential restrictor protrudes in a radially outward direction from an outer surface of the powder container.
13. The powder container according to any one of claims 4 to 7, wherein the circumferential restrictor is a circumferential restricting groove that extends from an outer surface of the powder container toward an inside of the powder container and is to fit a convex provided at the image forming apparatus.
14. The powder container according to any one of

claims 4 to 8 and 10 to 13, wherein the vertical restrictor restricts movement of the powder container in a vertical direction when the powder container is attached to the image forming apparatus.

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15. The powder container according to any one of claims 4 to 8 and 10 to 14, wherein the vertical restrictor restricts movement in a vertical direction by a guiding rail on the image forming apparatus when the powder
10 container is attached to the image forming apparatus.

16. The powder container according to any one of claims 4 to 8 and 10 to 15, wherein

the vertical restrictor includes a sliding guide
15 including an upper guide and a lower guide each extending in the longitudinal direction of the powder container, and the upper guide and the lower guide sandwich a guiding rail on the image forming apparatus to thereby restrict movement of the powder container in the vertical direction.

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17. The powder container according to claim 16, wherein a clearance gap between the upper guide and the lower guide on a downstream side in the powder-container attachment direction is narrower than the clearance gap on
25 an upstream side in the powder-container attachment direction.

18. The powder container according to any one of claims 4 to 17, wherein the radial restrictor restricts movement of
30 the powder container in a radial direction when the powder container is attached to the image forming apparatus.

19. The powder container according to claim 18,

wherein the radial restrictor is a protrusion that protrudes from an outer surface of the powder container and that is to contact with an inner surface of a container holding section of the image forming apparatus to thereby
5 restrict the movement of the powder container in the radial direction.

20. The powder container according to claim 19, wherein the protrusion protruding from the outer surface of
10 the powder container is at least on three positions on a front end of the powder container in the powder-container attachment direction.

21. The powder container according to claim 19
15 or 20, wherein the protrusion protruding from the outer surface of the powder container is at three evenly-spaced positions on a front end of the powder container in the powder-container attachment direction.

20 22. The powder container according to any one of claims 4 to 21, wherein the longitudinal restrictor restricts movement of the powder container in the longitudinal direction when the powder container is attached to the image forming apparatus.

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23. The powder container according to claim 22, the longitudinal restrictor is an engaged opening on an outer surface of the powder container, and is engaged with an engaging member on the image forming apparatus to
30 thereby restrict the movement of the powder container in the longitudinal direction.

24. The powder container according to any one of

claims 1 to 23, wherein an outer surface of the opening of the powder container and an inner surface of the container receiving section are to contact with each other to thereby determine a position of the powder container in a radial
5 direction.

25. The powder container according to any one of claims 1 to 24, further comprising an information storage medium that is on a front end of the powder container on a
10 downstream side in the powder-container attachment direction.

26. The powder container according to claim 25, wherein
15 the information storage medium includes an information storage medium opening, and
a pin arranged on the image forming apparatus is inserted in the information storage medium opening when the powder container is attached to the image forming apparatus.
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27. The powder container according to any one of claims 1 to 26, wherein
the powder includes toner, and
the powder container stores the toner.
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28. The powder container according to claim 27, wherein the powder further includes carrier.

29. The powder container according to claims 1 to 28, wherein an outer surface of the opening is to mate
30 with the container receiving section.

30. The powder container according to any one of

claims 1 to 29, wherein the conveyor rotates to convey the powder.

31. The powder container according to any one of
5 claims 1 to 30, wherein the container receiving section surrounds the conveying nozzle.

32. The powder container according to any one of
10 claims 1 to 31, wherein the conveyor conveys the powder to the powder receiving hole.

33. The powder container according to any one of
15 claims 1 to 32, wherein the container gear is near the opening.

34. The powder container according to any one of
claims 1 to 33, wherein the conveying nozzle is to
penetrate through an inside of the container gear.

20 35. The powder container according to any one of
claims 1 to 34, further comprising:
a container body that stores a powder,
wherein the container gear is at an outer surface of
the container body.

25 36. An image forming apparatus comprising:
the powder container according to any one of claims 1
to 35; and
an image forming unit that forms an image on an image
30 bearer by using the powder conveyed from the powder
container.