Amendments shown in red

However, a problem with the conventional cartridge is that the flexible strip must be adhered to each of the scoop plate and scrape plate, resulting in an extra step and extra cost. Moreover, the strip is apt to come off the scoop plate if the adhesion is defective or due to aging. Of course, the strip may be affixed to the scoop plate by crimping, fusing or similar technology, as proposed in the past. However, this also results in an extra step and extra cost and, in addition, causes the strip to come off easily.

SUMMARY OF THE INVENTION

According to the present invention, there is provided a toner cartridge for replenishing toner into a developing device, comprising:

a cartridge body formed with a toner supply port; and

a replenishing member rotatably disposed in said cartridge body, and for replenishing the toner from said cartridge body into the developing device via said toner supply port when rotated;

said replenishing member comprising:

a base having a rotary shaft;

a thin piece provided at a free edge of said base; said base and said thin piece comprising a single molding; and

at least two tie pieces connecting said thin piece and said base.

A thickness and a width of said at least two tie pieces may be so selected as to provide said thin piece, including said at least two tie pieces, with elasticity.

A distance between a center of rotation of said replenishing member and an outermost edge of said thin piece may be at least great enough for said outermost edge to slidingly contact part of an inner periphery of said cartridge body surrounding said toner supply port.

The base may comprise a flat ladder-like center piece and said thin piece comprises rake pieces and a scoop piece slidably contacting an inner periphery of said cartridge body, and wherein said rake pieces may adjoin longitudinally opposite ends of said center piece while said scoop piece may intervene between said rake pieces.

The rake pieces may slidably contact the inner periphery of said cartridge body, wherein said center piece may be driven to rotate at one of longitudinally opposite ends thereof, and wherein said rake pieces may be arranged in a smaller number at the one end of said center piece than at the other end.

The rake pieces may each have an outermost edge inclined relative to a center of rotation of said center piece such that one side of said rake piece closer to said scoop piece is higher in level than the other side.

The rake pieces may each be connected to said center piece by a comparatively long tie piece and a comparatively short tie piece, and wherein said comparatively long tie piece may be reduced in thickness at a portion thereof adjoining said center piece.

The replenishing member may comprise said center piece, said rake pieces and said scoop piece may be provided with a 180° symmetrical configuration with respect to a center of rotation.

The scoop piece may have a length smaller than a width of said toner supply port, as measured in a longitudinal direction of said cartridge body.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description taken with the accompanying drawings in which:

FIG. 1 is a section of a developing unit incorporating a toner cartridge embodying the present invention;

FIG. 2 is a partly taken away perspective view of the embodiment;

FIG. 3 is a perspective view of a replenishing member included in the embodiment;

FIG. 4 is a section of the replenishing member;

FIG. 5A shows a replenishing member representative of an alternative embodiment of the present invention;

FIG. 5B is an end view of the replenishing member shown in FIG. 5A;

FIG. 6A shows a modified form of the replenishing member shown in FIGS. 5A and 5B;.

FIG. 6B is an end view of the modified replenishing member;

CLAIMS

1. A toner cartridge for replenishing toner into a developing device, comprising:

a cartridge body formed with a toner supply port; and

a replenishing member rotatably disposed in said cartridge body, and for replenishing the toner from said cartridge body into the developing device via said toner supply port when rotated;

said replenishing member comprising:

a base having a rotary shaft;

a thin piece provided at a free edge of said base; said base and said thin piece comprising a single molding; and

at least two tie pieces connecting said thin piece and said base.

2. A toner cartridge as claimed in claim 1, wherein a thickness and a width of said at least two tie pieces are so selected as to provide said thin piece, including said at least two tie pieces, with elasticity.

3. A toner cartridge as claimed in claim 2, wherein a distance between a center of rotation of said replenishing member and an outermost edge of said thin piece is at least great enough for said outermost edge to slidingly contact part of an inner periphery of said cartridge body surrounding said toner supply port.

4. A toner cartridge as claimed in claim 1, wherein said base comprises a flat ladder-like center piece and said thin piece comprises rake pieces and a scoop piece slidably contacting an inner periphery of said cartridge body, and wherein said rake pieces adjoin longitudinally opposite ends of said center piece while said scoop piece intervene between said rake pieces.

5. A toner cartridge as claimed in claim 4, wherein said rake pieces slidably contact the inner periphery of said cartridge body, wherein said center piece is driven to rotate at one of longitudinally opposite ends thereof, and wherein said rake pieces are arranged in a smaller number at the one end of said center piece than at the other end.

6. A toner cartridge as claimed in claim 4, wherein said rake pieces each has an outermost edge inclined relative to a center of rotation of said center piece such that one side of said rake piece closer to said scoop piece is higher in level than the other side.

7. A toner cartridge as claimed in claim 6, wherein said rake pieces are each connected to said center piece by a comparatively long tie piece and a comparatively short tie piece, and wherein said comparatively long tie piece is reduced in thickness at a portion thereof adjoining said center piece.

8. A toner cartridge as claimed in claim 4, wherein said replenishing member comprising said center piece, said rake pieces and said scoop piece is provided with a 180° symmetrical configuration with respect to a center of rotation.

9. A toner cartridge as claimed in claim 4, wherein said scoop piece has a length smaller than a width of said toner supply port, as measured in a longitudinal direction of said cartridge body.