provided in the cartridge mounting portion 110 is inserted through the ink supply opening 71 and pushes the ink supply valve 70 such that the ink supply opening 71 is opened. When this occurs, ink is flowed out of the ink chamber 36 into the ink pipe 122 via the ink path 72 in the insertion direction 56.

[0027] In another embodiment, the ink cartridge 30 may not comprise the ink supply valve 70. In such a case, the ink supply opening 71 may be covered and closed by a film. When the ink cartridge 30 is mounted to the cartridge mounting portion 110, the ink pipe 122 may break through the film, such that the ink supply opening 71 is opened.

[0028] Referring to Figs. 3 and 4, the main body 31 comprises an engagement hook 43 at a bottom-wall 41 side and the front-wall 40 side of the main body 31. The engagement hook 43 extends forward in the depth direction (front-back direction) 53 from a lower portion of the front face of the main body 31. The front end of the engagement hook 43 comprises two protrusions extending outward in opposite directions in the width direction (left-right direction) 51. The engagement hook 43 has a cut-out formed therein. The cut-out is positioned at a middle portion of the engagement hook 43 with respect to the width direction (left-right direction) 51 and extends in the depth direction (front-back direction) 53. With this cut-out, the engagement hook 43 is configured to resiliently deform such that a dimension thereof in the width direction (left-right direction) 51 decreases. The protrusions of the front end of the engagement hook 43 are positioned in elongated openings 91, 92 formed through the bracket 90, respectively, and contact inner surfaces of the walls defining the elongated openings 91, 92, respectively.

[0029] The main body 31 comprises an engagement portion 45 positioned at a top-wall 39 side of the ink cartridge 30. More specifically, the engagement portion 45 is positioned at a middle portion of the top wall 39 with respect to the depth direction (front-back direction) 53. The engagement portion 45 extends upward from the top wall 39 and away from the ink chamber 36 and comprises an engagement surface 46 which extends in the width direction (left-right direction) 51 and the height direction (up-down direction) 52. The engagement surface 46 faces rearward with respect to the insertion direction 56, in other wards, faces in the removal direction 55, when the ink cartridge 30 is inserted into the cartridge mounting portion 110. In another embodiment, the engagement surface 46 may not extend vertically from the top wall 39, but may be inclined with respect to the height direction (~~left-right~~up-down direction) 5~~1~~2, and may face rearward with respect to the insertion direction 56, in other wards, face in the removal direction 55, when the ink cartridge 30 is inserted into the cartridge mounting portion 110. When the ink cartridge 30 is mounted to the cartridge mounting portion 110, the engagement surface 46 contacts an engagement member 145 of the cartridge mounting portion 110, and receives an external force. More specifically, when the ink cartridge

Claims

[Claim 1] A printing fluid cartridge (30) configured to be mounted to a cartridge mounting portion comprising an optical sensor and at least one contact, the printing fluid cartridge (30) comprising:
at least one electrical interface (75, 76, 77) configured to be electrically connected to the at least one contact; and
a light attenuating portion (33, 88, 89) configured to be inserted between a light emitter and a light receiver of the optical sensor and to be detected by the optical sensor.

[Claim 2] The printing fluid cartridge (30) of claim 1, wherein the printing fluid cartridge (30) is inserted into the cartridge mounting portion in an insertion direction (56) in an upright position, and the printing fluid cartridge (30) has a width in a width direction (51), a height in a height direction (52), and a depth in a depth direction (53), wherein the width direction (51), the height direction (52), and the depth direction (53) are perpendicular to each other, and the depth direction (53) is parallel with the insertion direction (56).

[Claim 3] The printing fluid cartridge (30) of claim 2, further comprising:
a chamber (36) configured to store printing fluid therein; and
a printing fluid supply portion (34) configured to supply the printing fluid from an interior of the chamber (36) to an exterior of the chamber (36).

[Claim 4] The printing fluid cartridge (30) of claim 3, further comprising:
a front face oriented toward the insertion direction (56) when the printing fluid cartridge (30) is inserted into the cartridge mounting portion, wherein the printing fluid supply portion (34) is positioned at the front face; and
a rear face positioned opposite the front face with respect to the insertion direction (56),
wherein the at least one electrical interface (75, 76, 77) is positioned between the front face and the rear face.

[Claim 5] The printing fluid cartridge (30) of claim 4, wherein when the printing fluid cartridge (30) is in the upright position, the printing fluid supply portion (34) is positioned at a lower portion of the front face and the at least one electrical interface (75, 76, 77) is positioned above the printing fluid supply portion (34).

[Claim 6] The printing fluid cartridge (30) of claim 2, wherein the light at-

tenuating portion (33, 88, 89) extends in the depth direction (53).

[Claim 7] The printing fluid cartridge (30) of claim 6, wherein the at least one electrical interface (75, 76, 77) and the light attenuating portion (88) are provided at a one side of the printing fluid cartridge (30), and a width of the light attenuating portion (88) in the width direction (51) is less than a width of the electrical interface (75, 76, 77) in the width direction (51).

[Claim 8] The printing fluid cartridge (30) of claim 7, wherein the light attenuating portion (88) is positioned more forward than the at least one electrical interface (75, 76, 77) with respect to the insertion direction (56).

[Claim 9] The printing fluid cartridge (30) of claim 8, wherein the at least one electrical interface (75, 76, 77) is positioned more outside than the light attenuating portion (88).

[Claim 10] The printing fluid cartridge (30) of claim 9, further comprising a top face connected to the front face and the rear face, wherein the top face faces upward when the printing fluid cartridge (30) is in the upright position, and the at least one electrical interface (75, 76, 77) and the light attenuating portion (88) are positioned at a top-face side of the printing fluid cartridge (30).

[Claim 11] The printing fluid cartridge (30) of claim 9, wherein the at least one electrical interface (75, 76, 77) and the light attenuating portion (88) are positioned, such that the at least one electrical interface ((75, 76, 77) and the light attenuating portion (88) intersect a plane which is parallel with the height direction (52) and the depth direction (53).

[Claim 12] The printing fluid cartridge (30) of claim 2, wherein the light attenuating portion (33, 88, 89) is configured to attenuate light traveling in the width direction (51) perpendicular to the insertion direction (56), and the at least one electrical interface (75, 76, 77) is accessible in a direction perpendicular to the width direction (51) and the insertion direction (56).

[Claim 13] The printing fluid cartridge (30) of claim 2, wherein the at lest one electrical interface (75, 76, 77) comprises a first electrical interface (75), a second electrical interface (76), and a third electrical interface (77) aligned and space apart from each other in the width direction (51), wherein the second electrical interface (76) is positioned between the first electrical interface (75) and the third electrical interface (77), and the at least one electrical interface (75, 76, 77) and the light at-

tenuating portion (33, 88, 89) are positioned, such that the second electrical interface (76) and the light attenuating portion (33, 88, 89) intersect a plane which is parallel with the height direction (52) and the depth direction (53).

[Claim 14] The printing fluid cartridge (30) of claim 13, wherein the center of the second electrical interface (76) and the center of the light attenuating portion (33, 88, 89) are positioned on the plane which is parallel with the height direction (52) and the depth direction (53).

[Claim 15] The printing fluid cartridge (30) of claim 14, wherein the light attenuating portion (88) has a width in the width direction (51) and the second electrical interface (76) has a width in the width direction (51), and the width of the light attenuating portion (88) is less than the width of the second electrical interface (76).

[Claim 16] The printing fluid cartridge (30) of claim 1, wherein the light attenuating portion (88) is configured to provide information as to the presence of the printing fluid cartridge (30) in the cartridge mounting portion by attenuating light of the optical sensor.

[Claim 17] The printing fluid cartridge (30) of claim 1, wherein the light attenuating portion (88, 89) is configured to provide information as to a type of the printing fluid cartridge (30) by attenuating light of the optical sensor.

[Claim 18] A printing apparatus (10) comprising:
the printing fluid cartridge (30) of claim 1; and
a cartridge mounting portion (110) to which the printing fluid cartridge (30) is configured to be mounted, the cartridge mounting portion (110) comprising:
at least one contact (106) configured to be electrically connected to the at least one electrical interface (75, 76, 77); and
an optical sensor (114, 116) configured to detect the light attenuating portion (33, 88, 89).

[Claim 19] The printing apparatus (10) of claim 18, wherein the printing fluid cartridge (30) further comprises a chamber (36) configured to store printing fluid therein and a printing fluid supply portion (34) configured to supply the printing fluid from an interior of the chamber (36) to an exterior of the chamber (36) and wherein the cartridge mounting portion (110) comprises an ink pipe (122) configured to be inserted into the printing fluid supply portion (34).

[Claim 20] Use of the printing fluid cartridge (30) of claim 1, so that at least one

electrical interface (75, 76, 77) is electrically connected to the at least one contact and the light attenuating portion (33, 88, 89) attenuates light emitted from the light emitter of the optical sensor.

[Claim 21] Use of the printing fluid cartridge (30) of claim 20, so that the at lest one electrical interface (75, 76, 77) contacts the at least one contact during mounting of the printing fluid cartridge (30) to the cartridge mounting portion.

[Claim 22] Use of the printing fluid cartridge (30) of claim 20, so that the at least one electrical interface (75, 76, 77) contacts the at least one contact after the light attenuating portion (88, 89) starts to attenuate the light.

CLAIMS:

1. A printing fluid cartridge comprising:

at least one electrical interface configured to be electrically connected to at least one contact;

a light attenuating portion configured to attenuate light;

a chamber configured to store printing fluid therein;

a printing fluid supply portion configured to supply the printing fluid from an interior of the chamber to an exterior of the chamber;

a front face oriented toward a first direction, wherein the printing fluid supply portion is positioned at the front face; and

a rear face positioned opposite the front face and oriented toward a second direction opposite the first direction,

wherein the at least one electrical interface is positioned between the front face and the rear face, and

wherein the light attenuating portion is configured to attenuate light traveling in a third direction perpendicular to the first direction and the second direction, and the at least one electrical interface is accessible in a fourth direction perpendicular to the first direction, the second direction, and the third direction,

wherein the at least one electrical interface comprises a first electrical interface, a second electrical interface, and a third electrical interface aligned and spaced apart from each other in the third direction, wherein the second electrical interface is positioned between the first electrical interface and the third electrical interface, and the at least one electrical interface and the light attenuating portion are positioned, such that the second electrical interface and the light attenuating portion intersect a plane which is parallel with the first direction, the second direction, and the fourth direction, and

wherein a center of the second electrical interface and a center of the light attenuating portion are positioned on the plane which is parallel with the first direction, the second direction, and the fourth direction.

2. The printing fluid cartridge of claim 1, wherein the printing fluid supply portion is positioned at a lower portion of the front face and the at least one electrical interface is positioned above the printing fluid supply portion when the printing fluid cartridge is in use.

3. The printing fluid cartridge of claim 1, wherein the light attenuating portion extends in the first direction.

4. The printing fluid cartridge of claim 1, wherein the light attenuating portion has a width in the third direction and the second electrical interface has a width in the third direction, and the width of the light attenuating portion is less than the width of the second electrical interface.

5. The printing fluid cartridge of claim 1, wherein the light attenuating portion is configured to provide information as to presence of the printing fluid cartridge by attenuating the light.

6. The printing fluid cartridge of claim 1, wherein the light attenuating portion is configured to provide information as to a type of the printing fluid cartridge by attenuating the light.

7. The printing fluid cartridge of claim 1, wherein the light attenuating portion is positioned farther from the rear face than the at least one electrical interface is with respect to the first direction.

8. The printing fluid cartridge of claim 7, wherein the at least one electrical interface is positioned more outside than the light attenuating portion.

9. The printing fluid cartridge of claim 8, further comprising a top face connected to the front face and the rear face, wherein the top face faces upward when the printing fluid cartridge is in use, and the at least one electrical interface and the light attenuating portion are positioned at a top-face side of the printing fluid cartridge.

10. Use of the printing fluid cartridge of claim 1, wherein the at least one electrical interface is electrically connected to the at least one contact and the light attenuating portion attenuates light emitted from a light emitter of an optical sensor of a cartridge mounting portion during mounting of the printing fluid cartridge to the cartridge mounting portion.

11. Use of the printing cartridge of claim 10, wherein the at least one electrical interface contacts the at least one contact after the light attenuating portion starts to attenuate the light during the mounting of the printing fluid cartridge to the cartridge mounting portion.

12. A printing apparatus comprising:

the printing fluid cartridge of claim 1;

a cartridge mounting portion to which the printing fluid cartridge is configured to be mounted, the cartridge mounting portion comprising:

at least one contact configured to be electrically connected to the at least one electrical interface,

an optical sensor configured to detect the light attenuating portion.

13. A printing fluid cartridge comprising:

at least one electrical interface configured to be electrically connected to at least one contact;

a light attenuating portion configured to attenuate light;

a chamber configured to store printing fluid therein;

a printing fluid supply portion configured to supply the printing fluid from an interior of the chamber to an exterior of the chamber;

a front face oriented toward a first direction, wherein the printing fluid supply portion is positioned at the front face; and

a rear face positioned opposite the front face and oriented toward a second direction opposite the first direction,

wherein the at least one electrical interface is positioned between the front face and the rear face,

wherein the light attenuating portion is configured to attenuate light travelling in a third direction perpendicular to the first direction and the second direction,

wherein the at least one electrical interface comprises a first electrical interface, a second electrical interface, and a third electrical interface aligned and spaced apart from each other in the third direction, wherein the second electrical interface is positioned between the first electrical interface and the third electrical interface, and

wherein the light attenuating portion has a maximum width in the third direction and the second electrical interface has a maximum width in the third direction, and the

maximum width of the light attenuating portion in the third direction is less than the maximum width of the second electrical interface in the third direction.

14. The printing fluid cartridge of claim 13, wherein the light attenuating portion is configured to provide information as to presence of the printing fluid cartridge by attenuating the light.

15. The printing fluid cartridge of claim 13, wherein the light attenuating portion is configured to provide information as to a type of the printing fluid cartridge by attenuating the light.