CLAIMS

1. A toner cartridge for use in an image forming device, comprising:

a housing having a top, a bottom, a front, and a rear positioned between a first side and a second side of the housing, the housing defining a reservoir for containing toner therein;

an exit port in fluid communication with the reservoir and facing downward on the front of the housing near the first side;

a shutter positioned at the exit port that is movable between an open position to permit toner to pass out of the exit port and a closed position to prevent toner from passing out of the exit port;

a toner delivery system for transferring toner from the reservoir out of the exit port that includes a main interface gear for providing rotational power to the toner delivery system, a portion of the main interface gear being exposed on the front of the housing near the top of the second side and engagable with a corresponding drive gear in the image forming device;

a rearward facing opening near the first side of the housing for receiving a first engagement feature in the image forming device for opening and closing the shutter; and

a forward facing slot near the first side of the housing for receiving a second engagement feature in the image forming device for locking and unlocking the shutter.

2. The toner cartridge of claim 1, further comprising:

a first wing guide positioned on the first side of the housing and a second wing guide positioned on the second side of the housing substantially parallel to the first wing guide, each wing guide having a generally elongated body that extends between the rear and the front of the housing; and

a pair of rounded projections extending from a bottom surface of one of the first wing guide and the second wing guide and a rounded projection extending from a bottom surface of the other of the first wing guide and the second wing guide that define contact points to control the vertical position of the toner cartridge in the image forming device.

3. The toner cartridge of claim 2, further comprising a first stop extending from the first wing guide and a second stop extending from the second wing guide to limit the forward travel of the toner cartridge in the image forming device.

4. The toner cartridge of claim 2, further comprising a first leg and a second leg each projecting from the bottom of the housing and extending between the rear and the front of the housing to limit the side-to-side travel of the toner cartridge during insertion into the image forming device.

5. The toner cartridge of claim 4, wherein a front portion of at least one of the first and second legs tapers forming a nose at a front tip thereof that is sized to engage a corresponding slot in the image forming device to more finely control the side-to-side travel of the toner cartridge in the image forming device.

6. The toner cartridge of claim 4, further comprising a slot on the front of the housing between the first and second legs that is sized to receive a corresponding projection in the image forming device to more finely control the side-to-side travel of the toner cartridge in the image forming device.

7. The toner cartridge of claim 1, further comprising a first engagement surface projecting from the top of the housing near the first side of the housing and a second engagement surface projecting from the top of the housing near the second side of the housing for receiving a hold down force from the image forming device, each of the first and second engagement surfaces including an angled front surface that faces toward the front of the housing and an angled rear surface that faces toward the rear of the housing.

8. The toner cartridge of claim 1, further comprising:

a linkage operatively connected to the shutter to open the shutter upon being actuated by the first engagement feature in the image forming device; and

an interlock operatively engaged with the linkage and biased toward a locked position preventing the linkage from opening the shutter, the interlock being movable to an unlocked position upon being actuated by the second engagement feature in the image forming device that permits the linkage to open the shutter.

9. The toner cartridge of claim 8, wherein the linkage includes a first linkage member positioned to receive the first engagement feature and a second linkage member connected to

the shutter, wherein in the locked position the interlock prevents the second linkage member from opening the shutter but permits the first linkage member to move relative to the second linkage member and in the unlocked position the interlock permits the second linkage member to open the shutter when the first linkage member is actuated by the first engagement feature.

10. The toner cartridge of claim 1, further comprising a connector on one of the first side and the second side of the housing having electrical contacts for processing circuitry of the toner cartridge, the connector having a forward facing opening for receiving corresponding electrical contacts in the image forming device, the one of the first side and the second side of the housing having a tapered lead-in aligned with the forward facing opening.

11. The toner cartridge of claim 1, wherein the toner delivery system includes:

an auger for delivering toner to the shutter that is rotatably mounted within the housing in a channel that extends along the front of the housing, the channel including a portion that is open to the reservoir; and

a paddle rotatably mounted within the reservoir for delivering toner to the auger, the paddle having a rotational axis that is positioned below a rotational axis of the auger.

12. The toner cartridge of claim 1, further comprising a projection extending forward from the housing and spaced from the exit port toward the first side of the housing for engaging a developer unit when the toner cartridge is inserted into the image forming device.

13. A toner cartridge for use in an image forming device having an imaging unit separate from the toner cartridge removably installed therein, the toner cartridge comprising, comprising:

a housing having a top, a bottom, a front, and a rear positioned between a first side and a second side of the housing, the housing defining a reservoir for containing toner therein;

an exit port in fluid communication with the reservoir and facing downward on the front of the housing near the first side;

a shutter positioned at the exit port that is movable between an open position to permit toner to pass out of the exit port and a closed position to prevent toner from passing out of the exit port;

a toner delivery system for transferring toner from the reservoir out of the exit port that includes a main interface gear for providing rotational power to the toner delivery system, a portion of the main interface gear being exposed on the front of the housing near the top of the second side and engagable with a corresponding drive gear in the image forming device;

a linkage operatively connected to the shutter to open the shutter upon being actuated by an engagement feature on the image forming device;

a rearward facing opening near the first side of the housing for receiving the engagement feature on the image forming device;

an interlock operatively engaged with the linkage and biased toward a locked position preventing the linkage from opening the shutter, the interlock being movable to an unlocked position upon being actuated by an engagement feature on the imaging unit that permits the linkage to open the shutter; and

a forward facing slot near the first side of the housing for receiving the engagement feature on the imaging unit.

14. The toner cartridge of claim 13, further comprising:

a first wing guide positioned on the first side of the housing and a second wing guide positioned on the second side of the housing substantially parallel to the first wing guide, each wing guide having a generally elongated body that extends between the rear and the front of the housing; and

a pair of rounded projections extending from a bottom surface of one of the first wing guide and the second wing guide and a rounded projection extending from a bottom surface of the other of the first wing guide and the second wing guide that define contact points to control the vertical position of the toner cartridge in the image forming device.

15. The toner cartridge of claim 13, wherein the linkage includes a first linkage member positioned to receive the engagement feature on the image forming device and a second linkage member connected to the shutter, wherein in the locked position the interlock prevents the second linkage member from opening the shutter but permits the first linkage member to move relative to the second linkage member and in the unlocked position the interlock permits the second linkage member to open the shutter when the first linkage member is actuated by the engagement feature on the image forming device.

What is claimed is:

1. A toner cartridge for use in an image forming device, comprising:

a housing having a top, a bottom, a front, and a rear positioned between a first side and a second side of the housing, the housing defining a reservoir for containing toner therein;

an exit port in fluid communication with the reservoir and facing downward on the front of the housing near the first side;

a shutter positioned at the exit port that is movable between an open position to permit toner to pass out of the exit port and a closed position to prevent toner from passing out of the exit port;

a toner delivery system for transferring toner from the reservoir out of the exit port that includes a main interface gear for providing rotational power to the toner delivery system, a portion of the main interface gear being exposed on the front of the housing near the top of the second side and engagable with a corresponding drive gear in the image forming device;

a rearward facing opening exposed at the rear of the housing near the first side of the housing and extending from the rear of the housing toward the front of the housing for receiving a first engagement feature in the image forming device for opening and closing the shutter; and

a forward facing slot exposed at the front of the housing near the first side of the housing and extending from the front of the housing toward the rear of the housing for receiving a second engagement feature in the image forming device for locking and unlocking the shutter.

2. The toner cartridge of claim 1, further comprising:

a first wing guide positioned on the first side of the housing and a second wing guide positioned on the second side of the housing substantially parallel to the first wing guide, each wing guide having a generally elongated body that extends along a front-to-rear dimension of the housing; and

a pair of rounded projections extending from a bottom surface of one of the first wing guide and the second wing guide and a rounded projection extending from a bottom surface of the other of the first wing guide and the second wing guide that define contact points to control the vertical position of the toner cartridge in the image forming device.

3. The toner cartridge of claim 2, further comprising a first stop extending from the first wing guide and a second stop extending from the second wing guide to limit the forward travel of the toner cartridge in the image forming device.

4. The toner cartridge of claim 1, further comprising a first leg and a second leg each projecting from the bottom of the housing and extending along a front-to-rear dimension of the housing to limit the side-to-side travel of the toner cartridge during insertion into the image forming device.

5. The toner cartridge of claim 4, wherein a front portion of at least one of the first and second legs tapers forming a nose at a front tip thereof that is sized to engage a corresponding slot in the image forming device to more finely control the side-to-side travel of the toner cartridge in the image forming device.

6. The toner cartridge of claim 4, further comprising a slot on the front of the housing between the first and second legs that is sized to receive a corresponding projection in the image forming device to more finely control the side-to-side travel of the toner cartridge in the image forming device.

7. The toner cartridge of claim 1, further comprising a first engagement surface projecting to a topmost point of the housing near the first side of the housing and a second engagement surface projecting to the topmost point of the housing near the second side of the housing for receiving a hold down force from the image forming device, each of the first and second engagement surfaces including an angled front surface that faces toward the front of the housing and an angled rear surface that faces toward the rear of the housing.

8. The toner cartridge of claim 1, further comprising:

a linkage operatively connected to the shutter to open the shutter upon being actuated by the first engagement feature in the image forming device; and

an interlock operatively engaged with the linkage and biased toward a locked position preventing the linkage from opening the shutter, the interlock being movable to an unlocked position upon being actuated by the second engagement feature in the image forming device that permits the linkage to open the shutter.

9. The toner cartridge of claim 8, wherein the linkage includes a first linkage member positioned to receive the first engagement feature and a second linkage member connected to the shutter, wherein in the locked position the interlock prevents the second linkage member from opening the shutter but permits the first linkage member to move relative to the second linkage member and in the unlocked position the interlock permits the second linkage member to open the shutter when the first linkage member is actuated by the first engagement feature.

10. The toner cartridge of claim 1, further comprising a connector on one of the first side and the second side of the housing having electrical contacts for processing circuitry of the toner cartridge, the connector having a forward facing opening for receiving corresponding electrical contacts in the image forming device, the one of the first side and the second side of the housing having a tapered lead-in aligned with the forward facing opening.

11. The toner cartridge of claim 1, wherein the toner delivery system includes:

an auger for delivering toner to the shutter that is rotatably mounted within the housing in a channel that extends along the front of the housing, the channel including a portion that is open to the reservoir; and

a paddle rotatably mounted within the reservoir for delivering toner to the auger, the paddle having a rotational axis that is positioned below a rotational axis of the auger.

12. The toner cartridge of claim 1, further comprising a projection extending forward from the housing further forward than a frontmost portion of the exit port and spaced from the exit port toward the first side of the housing, a front of the projection being unobstructed for engaging a developer unit when the toner cartridge is inserted into the image forming device.

13. A toner cartridge for use in an image forming device, comprising:

a housing having a top, a bottom, a front, and a rear positioned between a first side and a second side of the housing, the housing defining a reservoir for containing toner therein, the housing having an elongated shape between the first side and the second side;

an exit port in fluid communication with the reservoir and facing downward on the front of the housing near the first side;

a toner delivery system for transferring toner from the reservoir out of the exit port that includes a main interface gear for providing rotational power to the toner delivery system, a portion of the main interface gear being exposed on the front of the housing near the top of the second side and engagable with a corresponding drive gear in the image forming device;

a rearward facing opening exposed at the rear of the housing near the first side of the housing and extending from the rear of the housing toward the front of the housing for receiving a first engagement feature in the image forming device; and

a forward facing opening exposed at the front of the housing near the first side of the housing and extending from the front of the housing toward the rear of the housing for receiving a second engagement feature in the image forming device.

14. The toner cartridge of claim 13, further comprising:

a first wing guide positioned on the first side of the housing and a second wing guide positioned on the second side of the housing substantially parallel to the first wing guide, each wing guide having a generally elongated body that extends along a front-to-rear dimension of the housing; and

a pair of rounded projections extending from a bottom surface of one of the first wing guide and the second wing guide and a rounded projection extending from a bottom surface of the other of the first wing guide and the second wing guide that define contact points to control the vertical position of the toner cartridge in the image forming device.

15. The toner cartridge of claim 14, further comprising a first stop extending from the first wing guide and a second stop extending from the second wing guide to limit the forward travel of the toner cartridge in the image forming device.

16. The toner cartridge of claim 13, further comprising a first leg and a second leg each projecting from the bottom of the housing and extending along a front-to-rear dimension of the housing to limit the side-to-side travel of the toner cartridge during insertion into the image forming device.

17. The toner cartridge of claim 16, wherein a front portion of at least one of the first and second legs tapers forming a nose at a front tip thereof that is sized to engage a corresponding slot in the image forming device to more finely control the side-to-side travel of the toner

cartridge in the image forming device.

18. The toner cartridge of claim 16, further comprising a slot on the front of the housing between the first and second legs that is sized to receive a corresponding projection in the image forming device to more finely control the side-to-side travel of the toner cartridge in the image forming device.

19. The toner cartridge of claim 13, further comprising a first engagement surface projecting to a topmost point of the housing near the first side of the housing and a second engagement surface projecting to the topmost point of the housing near the second side of the housing for receiving a hold down force from the image forming device, each of the first and second engagement surfaces including an angled front surface that faces toward the front of the housing and an angled rear surface that faces toward the rear of the housing.

20. The toner cartridge of claim 13, further comprising a connector on one of the first side and the second side of the housing having electrical contacts for processing circuitry of the toner cartridge, the connector having a forward facing opening for receiving corresponding electrical contacts in the image forming device, the one of the first side and the second side of the housing having a tapered lead-in aligned with the forward facing opening.

21. The toner cartridge of claim 13, wherein the toner delivery system includes:

an auger for delivering toner to the exit port that is rotatably mounted within the housing in a channel that extends along the front of the housing, the channel including a portion that is open to the reservoir; and

a paddle rotatably mounted within the reservoir for delivering toner to the auger, the paddle having a rotational axis that is positioned below a rotational axis of the auger.

22. The toner cartridge of claim 13, further comprising a projection extending forward from the housing further forward than a frontmost portion of the exit port and spaced from the exit port toward the first side of the housing, a front of the projection being unobstructed for engaging a developer unit when the toner cartridge is inserted into the image forming device.

23. The toner cartridge of claim 12, further comprising a knob that extends from the front

of the projection away from the exit port toward the first side, a front of the knob being unobstructed for engaging the developer unit when the toner cartridge is inserted into the image forming device.

24. The toner cartridge of claim 22, further comprising a knob that extends from the front of the projection away from the exit port toward the first side, a front of the knob being unobstructed for engaging the developer unit when the toner cartridge is inserted into the image forming device.

25. The toner cartridge of claim 1, wherein the rearward facing opening and the forward facing slot are aligned with each other in a side-to-side dimension of the housing.

26. The toner cartridge of claim 13, wherein the rearward facing opening and the forward facing opening are aligned with each other in a side-to-side dimension of the housing.