CLAIMS

Claim 1. A photosensitive member unit detachably mountable to a main assembly of an image forming apparatus, the photosensitive member unit comprising:

a photosensitive member rotatable about a rotational axis thereof;

a first gear portion; and

a second gear portion including a plurality of teeth,

wherein the first gear portion is a helical gear portion including a helical tooth which is twisted in a first circumferential direction about the rotational axis of the photosensitive member as a distance from the photosensitive member measured along the rotational axis of the photosensitive member increases,

wherein the second gear portion is disposed between the first gear portion and the photosensitive member with respect to a direction of the rotational axis of the photosensitive member,

wherein a gap is provided between the first gear portion and the second gear portion with respect to the direction of the rotational axis of the photosensitive member, and

wherein the teeth of the second gear portion include a tooth which has (i) a first projecting portion extending at least in the direction of the rotational axis of the photosensitive member and (ii) a second projecting portion disposed at a position which is downstream of at least a part of the first projecting portion in the first circumferential direction and which is closer to the first gear portion in the direction of the rotational axis of the photosensitive member than at least a part of the first projecting portion.

Claim 2. A photosensitive member unit according to Claim 1, wherein the at

least part of the first projecting portion is disposed between the second projecting portion and the photosensitive member with respect to the direction of the rotational axis of the photosensitive member.

Claim 3. A photosensitive member unit according to Claim 2, wherein the second projecting portion is a part of the second gear portion that is disposed at a position most remote from the photosensitive member with respect to the direction of the rotational axis of the photosensitive member.

Claim 4. A photosensitive member unit according to any one of Claims 1 - 3, wherein the first projecting portion includes a twisted projecting portion twisted in the first circumferential direction about the rotational axis of the photosensitive member as a distance from the photosensitive member measured along the rotational axis of the photosensitive member increases.

Claim 5. A photosensitive member unit according to Claim 4, wherein a helix angle of the twisted projecting portion is equal to or shorter than a helix angle of the helical tooth of the first gear portion.

Claim 6. A photosensitive member unit according to any one of Claims 1 - 5, wherein with respect to the direction of the rotational axis of the photosensitive member, a tooth width Wc of the first gear portion and a tooth width Wd of the second gear portion satisfy $Wc \leq Wd$.

Claim 7. A photosensitive member unit according to any one of Claims 1 - 6, wherein with respect to the direction of the rotational axis of the photosensitive member, a tooth width Wc of the first gear portion and a width We of the gap

satisfy Wc≤We.

Claim 8. A photosensitive member unit according to any one of Claims 1 - 7, wherein with respect to the direction of the rotational axis of the photosensitive member, the width We of the gap and the tooth width Wd of the second gear portion satisfy Wd ≤We.

Claim 9. A photosensitive member unit according to any one of Claims 1 - 8, wherein the helix angle of the tooth of the first gear portion is 15° or more and 40° or less.

Claim 10. A photosensitive member unit according to any one of Claims 1 - 9, wherein the helix angle of the tooth of the first gear portion is 20° or more and 35° or less.

Claim 11. A photosensitive member unit according to any one of Claims 1 - 10, wherein the first gear portion includes a plurality of such helical teeth which are constituted by first protrusions spaced apart in the direction of the rotational axis of the photosensitive member or in a rotational direction of the first gear portion.

Claim 12. A photosensitive member unit according to any one of Claims 1 - 11, wherein a plurality of such first projecting portions are constituted by second protrusions spaced apart in the rotational axis direction of the photosensitive member or in a rotational direction of the second gear portion.

Claim 13. A photosensitive member unit according to any one of Claims 1 -

12, wherein the first gear portion and the second gear portion are rotatable coaxially with each other.

Claim 14. A photosensitive member unit according to Claim 13, wherein the rotational axis of the first gear portion and the rotational axis of the second gear portion are co-axial with the rotational axis of the photosensitive member.

Claim 15. A photosensitive member unit according to any one of Claims 1 - 14, wherein the first gear portion and the second gear portion are integrally molded.

Claim 16. A photosensitive member unit according to any one of Claims 1 - 15, further comprising a flange mounted to an end portion of the photosensitive member in the direction of the rotational axis of the photosensitive member, and the first gear portion and the second gear portion are provided on the flange.

Claim 17. A photosensitive member unit according to any one of Claims 1 - 16, further comprising an intermediate member capable of filling the gap and provided between the first gear portion and the second gear portion with respect to a direction of the rotational axis of the photosensitive member.

Claim 18. A cartridge detachably mountable to a main assembly of an image forming apparatus, the cartridge comprising:

a rotatable member rotatable about a rotational axis;

a frame rotatably supporting the rotatable member;

a first gear portion; and

a second gear portion including a plurality of teeth,

wherein the first gear portion is a helical gear portion including a helical tooth which is twisted in a first circumferential direction about the rotational axis of the rotatable member as a distance from the rotatable member measured along the rotational axis of the rotatable member increases,

wherein the second gear portion is disposed between the first gear portion and the rotatable member with respect to a direction of the rotational axis of the rotatable member,

wherein a gap is provided between the first gear portion and the second gear portion with respect to the direction of the rotational axis of the rotatable member,

wherein the teeth of the second gear portion include a tooth which has (i) a first projecting portion extending at least in the direction of the rotational axis of the rotatable member and (ii) a second projecting portion disposed at a position which is downstream of at least a part of the first projecting portion in the first circumferential direction and which is closer to the first gear portion in the direction of the rotational axis of the rotatable member than at least a part of the first projecting portion.

Claim 19. A photosensitive member unit detachably mountable to a main assembly of an image forming apparatus, the main assembly including a first main assembly side helical gear portion and a second main assembly side helical gear portion which are rotatable coaxially with each other, wherein a twisting direction of a tooth of the second main assembly side helical gear portion is the same as a twisting direction of a tooth of the first main assembly side helical gear portion, and a helix angle of the tooth of the second main assembly side helical gear portion is greater than a helix angle of the tooth of the first main assembly side helical gear portion, the photosensitive member unit comprising:

a photosensitive member rotatable about a rotational axis;

a first unit side gear portion for engagement with the first main assembly side helical gear portion; and

a second unit side gear portion including a plurality of teeth for engagement with the second main assembly side helical gear portion,

wherein the first unit side gear portion is a helical gear portion including a helical tooth which is twisted in a first circumferential direction about the rotational axis of the photosensitive member as a distance from the photosensitive member measured along the rotational axis of the photosensitive member increases.

wherein the second unit side gear portion is disposed between the first unit side gear portion and the photosensitive member with respect to a direction of the rotational axis of the photosensitive member,

wherein a gap is provided between the first unit side gear portion and the second unit side gear portion with respect to the direction of the rotational axis of the photosensitive member,

wherein the teeth of the second unit side gear portion include a tooth which has (i) a first projecting portion extending at least in the direction of the rotational axis of the photosensitive member and (ii) a second projecting portion disposed at a position which is downstream of at least a part of the first projecting portion in the first circumferential direction and which is closer to the first unit side gear portion in the direction of the rotational axis of the photosensitive member than at least a part of the first projecting portion, and

wherein the first unit side gear portion and the second unit side gear portion are rotatable in a state that the first unit side gear portion is in engagement with the first main assembly side helical gear portion and that the second projecting portion of the second unit side gear portion is in engagement with the second

main assembly side helical gear portion.

Claim 20. A photosensitive member unit detachably mountable to a main assembly of an image forming apparatus, the main assembly including a first main assembly side helical gear portion and a second main assembly side helical gear portion which are rotatable co-axially with each other, the photosensitive member unit comprising:

a photosensitive member rotatable about a rotational axis;

a first unit side gear portion for engagement with the first main assembly side helical gear portion; and

a second unit side gear portion including a plurality of teeth for engagement with the second main assembly side helical gear portion,

wherein the first unit side gear portion is a helical gear portion including a helical tooth which is twisted in a first circumferential direction about the rotational axis of the photosensitive member as a distance from the photosensitive member measured along the rotational axis of the photosensitive member increases,

wherein the second unit side gear portion is disposed between the first unit side gear portion and the photosensitive member with respect to a direction of the rotational axis of the photosensitive member,

wherein a gap is provided between the first unit side gear portion and the second unit side gear portion with respect to the direction of the rotational axis of the photosensitive member,

wherein the teeth of the second unit side gear portion include a tooth which has (i) a first projecting portion extending at least in the direction of the rotational axis of the photosensitive member and (ii) a second projecting portion disposed at a position which is downstream of at least a part of the first projecting portion in

the first circumferential direction and which is closer to the first unit side gear portion in the direction of the rotational axis of the photosensitive member than at least a part of the first projecting portion, and

wherein while the first unit side gear portion and the second unit side gear portion are rotated in predetermined directions by rotation of the first main assembly side helical gear portion and the second main assembly side helical gear portion, a tooth of the first unit side gear portion contacts a tooth, of the first main assembly side helical gear portion, which is provided on an upstream side with respect to the first circumferential direction, and the second projecting portion of the second unit side gear portion contacts a tooth, of the second main assembly side helical gear portion, which is provided on a downstream side with respect to the first circumferential direction.

Claim 21. An electrophotographic image forming apparatus comprising: the photosensitive member unit according to any one of Claims 1 - 17, 19 and 20; and the main assembly including a transfer portion capable of transferring a toner image onto a recording material, the main assembly being capable of being loaded with the photosensitive member unit.

Claim 22. An electrophotographic image forming apparatus comprising: a cartridge according to Claim 18; and a main assembly including a transfer portion capable of transferring a toner image onto a recording material, the main assembly being capable of being loaded with the cartridge.