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(54) **ROTATION FORCE TRANSMISSION ASSEMBLY**

(57) A processing cartridge comprises a developing unit (41) and a photosensitive unit (31). The developing unit (41) comprises a developing element (42). The photosensitive unit (31) comprises a photosensitive element

(32). The processing cartridge further comprises a control unit. The developing element (42) and the photosensitive element (32) can be separated by means of the control unit

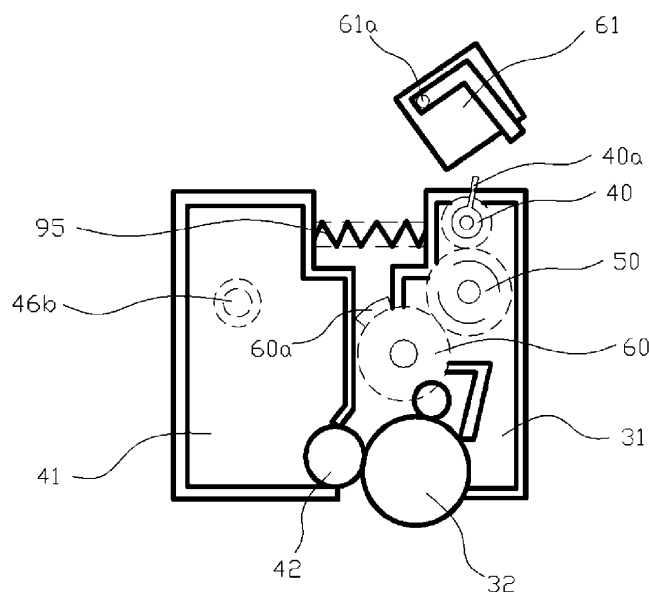


FIG. 3

Description

TECHNICAL FIELD

[0001] The utility model relates to a processing cartridge on the electronic image-forming device.

BACKGROUND ART

[0002] In the existing technology, the electronic image-forming device is provided with a coupling member of photosensitive element and a coupling member of the developing element, the processing cartridge is detachably installed in the electronic image-forming device, and receives driving force from the electronic image-forming device to drive the photosensitive element and the developing element on the processing cartridge.

TECHNICAL PROBLEM

[0003] The main purpose of the present disclosure is to provide a structure that can control the distance between the coupling member of photosensitive element and the coupling member of the developing element.

DISCLOSURE OF THE INVENTION

[0004] The main purpose of the present disclosure is to provide a structure that can control the distance between the coupling member of photosensitive element and the coupling member of the developing element. The specific structure is:

a processing cartridge, the processing cartridge includes a developing unit and a photosensitive unit, wherein the developing unit includes a developing element, and the photosensitive unit includes a photosensitive element; and a control unit, including a control element, wherein when the control element is close to or away from the developing unit, the developing element is away from or close to the photosensitive element.

[0005] Optionally, the control element in the control unit is configured to move between a first position and a second position; when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is in contact with the developing element; and when the control element is in the second position, the control element is closer to the developing unit than when the control element is in the first position, and at this point, the developing element is not in contact with the photosensitive element.

[0006] Optionally, the control element in the control unit is configured to move between a first position and a second position; when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is close to the developing element; and when the control element is in the second position, the control element is closer to

the developing unit than when the control element is in the first position, and at this point, the developing element is away from the photosensitive element.

[0007] Optionally, the control element is disposed on the developing unit and extends out of the developing unit to receive an external force.

[0008] Optionally, the control element includes a swing rod, and the control unit includes a first gear element, a second gear element, and a third gear element, which are disposed in the developing unit; the first gear element, the second gear element, and the third gear element are all disposed with gears; the first gear element is disposed with the swing rod configured to control a rotation of the first gear element; a gear on the second gear element meshes with a gear on the first gear element to transmit force; a gear on the third gear element meshes with a gear on the second gear element to transmit force; the third gear element is disposed with a cam portion which rotates with the third gear element; and a rotation of the swing rod controls the cam portion to be abutted or be not abutted against the photosensitive unit, thereby controlling the developing element to be close to or away from the photosensitive element.

[0009] Optionally, the control unit includes a pushing rod and an ejection rod; the pushing rod is the control element; the pushing rod is provided with a rotating axle, the ejection rod is provided with a rotating axle, and the pushing rod and the ejection rod are connected with each other by a hinge; the pushing rod and the ejection rod are both disposed on the developing unit; one end of the ejection rod is connected to the pushing rod, and the other end of the ejection rod extends toward a direction of the photosensitive unit; the pushing rod extends out of the developing unit; a rotation of the pushing rod around the rotating axle of the pushing rod controls a rotation of the ejection rod, such that the ejection rod is not abutted against or does not press the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

[0010] Optionally, the control unit includes a first pressing rod, a second gear element, and a third gear element; the first pressing rod is disposed with a rack portion which meshes with the second gear element, and the second gear element meshes with the third gear element; the third gear element is disposed with a cam portion; the first pressing rod, also disposed with an inclined surface, extends out of the developing unit; the first pressing rod is the control element; and the first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the cam portion meshes with or does not mesh with the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

[0011] Optionally, the control unit includes a first pressing rod and a second ejection rod; the first pressing rod is the control element; the first pressing rod is capable of moving on the developing unit; an inclined surface is disposed on the first pressing rod; the second ejection

rod is configured to rotate around a rotating axle disposed on the developing unit; and the first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the second ejection rod is abutted or not abutted against the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

[0012] The embodiments in the present disclosure may achieve at least the following beneficial effects.

[0013] After adopting the above structure, the developing element can be effectively controlled to close to or away from the photosensitive element..

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 illustrates a schematic of a processing cartridge when a developing element is in contact with a photosensitive element in the present disclosure; FIG. 2 illustrates a schematic of a processing cartridge when a developing element is separated from a photosensitive element in the present disclosure.

BEST MODE FOR CARRYING OUT THE INVENTION

[0015] A processing cartridge, the processing cartridge includes a developing unit and a photosensitive unit, wherein the developing unit includes a developing element, and the photosensitive unit includes a photosensitive element; and a control unit, including a control element, wherein when the control element is close to or away from the developing unit, the developing element is away from or close to the photosensitive element.

[0016] Optionally, the control element in the control unit is configured to move between a first position and a second position; when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is in contact with the developing element; and when the control element is in the second position, the control element is closer to the developing unit than when the control element is in the first position, and at this point, the developing element is not in contact with the photosensitive element.

[0017] Optionally, the control element in the control unit is configured to move between a first position and a second position; when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is close to the developing element; and when the control element is in the second position, the control element is closer to the developing unit than when the control element is in the first position, and at this point, the developing element is away from the photosensitive element.

[0018] Optionally, the control element is disposed on the developing unit and extends out of the developing unit to receive an external force.

[0019] Optionally, the control element includes a swing rod, and the control unit includes a first gear element, a second gear element, and a third gear element, which are disposed in the developing unit; the first gear element, the second gear element, and the third gear element are all disposed with gears; the first gear element is disposed with the swing rod configured to control a rotation of the first gear element; a gear on the second gear element meshes with a gear on the first gear element to transmit force; a gear on the third gear element meshes with a gear on the second gear element to transmit force; the third gear element is disposed with a cam portion which rotates with the third gear element; and a rotation of the swing rod controls the cam portion to be abutted or be not abutted against the photosensitive unit, thereby controlling the developing element to be close to or away from the photosensitive element.

[0020] Optionally, the control unit includes a pushing rod and an ejection rod; the pushing rod is the control element; the pushing rod is provided with a rotating axle, the ejection rod is provided with a rotating axle, and the pushing rod and the ejection rod are connected with each other by a hinge; the pushing rod and the ejection rod are both disposed on the developing unit; one end of the ejection rod is connected to the pushing rod, and the other end of the ejection rod extends toward a direction of the photosensitive unit; the pushing rod extends out of the developing unit; a rotation of the pushing rod around the rotating axle of the pushing rod controls a rotation of the ejection rod, such that the ejection rod is not abutted against or does not press the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

[0021] Optionally, the control unit includes a first pressing rod, a second gear element, and a third gear element; the first pressing rod is disposed with a rack portion which meshes with the second gear element, and the second gear element meshes with the third gear element; the third gear element is disposed with a cam portion; the first pressing rod, also disposed with an inclined surface, extends out of the developing unit; the first pressing rod is the control element; and the first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the cam portion meshes with or does not mesh with the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

[0022] Optionally, the control unit includes a first pressing rod and a second ejection rod; the first pressing rod is the control element; the first pressing rod is capable of moving on the developing unit; an inclined surface is disposed on the first pressing rod; the second ejection rod is configured to rotate around a rotating axle disposed on the developing unit; and the first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the second ejection rod is abutted or not abutted against the photosensitive unit, thereby making the developing element

close to or away from the photosensitive element.

EMBODIMENTS OF THE INVENTION

[0023] The following explains the invention is described with reference to the accompanying drawings and embodiments, the embodiments adopted by the invention may merely be used to explain the present invention and may not be used to limit the invention.

Embodiment 1

[0024] Referring to FIG. 1, a developing unit 41 and a photosensitive unit 31 may be disposed on a processing cartridge. The developing unit 41 may be disposed with a developing element 42, and the photosensitive unit 31 may be disposed with a photosensitive element 32. The developing unit 41 may be close to or away from the photosensitive unit 31, such that the developing element 42 may be in contact or not be in contact with (i.e., separation) the photosensitive element 32. As shown in FIG. 1, the developing unit 41 may rotate around a rotating axle 46b to achieve the contact or non-contact (i.e., separation) between the developing element 42 and the photosensitive element 32. An elastic element 95 may also be disposed between the developing unit 41 and the photosensitive unit 31. The elastic element 95 may provide an elastic force for the developing unit 41 and the photosensitive unit 31, such that the developing unit 41 may rotate around the rotating axle 46b, and the developing element 42 may move close to be in contact with the photosensitive element 32. As shown in FIG. 1, an electronic image-forming device (i.e., a printer, a copier, a fax machine and the like) may be disposed with a force applying element 61; and the force applying element 61 may rotate around its own rotating axle 61a.

[0025] A control unit may also be disposed on the processing cartridge, and the control unit may include a pushing rod 10, a rotating rod 20, and an ejection rod 30. The pushing rod 10 and the rotating rod 20 may be connected with each other by a hinge 10a; the rotating rod 20 may rotate around a rotating axle 20a; one end of the ejection rod 30 may be connected to the rotating rod 20 by a hinge 20b; the ejection rod 30 may rotate around a rotating axle 30a, and the other end of the ejection rod 30 may be abutted against the developing unit 41. The position of the developing unit 41 being abutted against the ejection rod 30 may be located on the other side of the rotating axle 46b with respect to the pushing rod 10. The farther the position of the developing unit 41 being abutted against the ejection rod 30 is away from the rotating axle 46b, the smaller the force required to separate the developing unit 41 is. The control unit (the pushing rod 10, the rotating rod 20, and the ejection rod 30) may all be disposed on the photosensitive unit 31.

[0026] As shown in FIG. 1, when the force applying element 61 on the electronic image-forming device is not in contact with the pushing rod 10 to apply a force to the

pushing rod 10, the elastic element 95 may rotate the developing unit 41 around the rotating axle 61a, such that the developing unit 41 may move close to the photosensitive unit 31. Therefore, the developing unit 41 may be in contact with the photosensitive unit 31.

[0027] As shown in FIG. 2, when the force timing element 61 is abutted against the pushing rod 10 to apply a force to the pushing rod 10, the pushing rod 10 may move along a direction A in FIG. 2, thereby driving the rotating rod 20 to rotate around the rotating axle 20a along a direction B in FIG. 2; then the ejection rod 30 may rotate around the rotating axle 30a along a direction C shown in FIG. 2 under the action of the rotating rod 20, and finally the ejection rod 30 may push the developing unit 41 to rotate around the rotating axle 61a. The rotation of the developing unit 41 may make the developing element 42 to move along a direction away from the photosensitive element 32, and finally the developing element 42 may not be in contact with the photosensitive element 32 (separation) and a distance L may also be formed.

[0028] By disposing the control unit on the photosensitive unit 31, the driving force of the force applying element 61 located above the photosensitive element 32 may be converted into the rotational force of the developing unit 41, thereby implementing the separation of the developing element 42 and the photosensitive element 32.

[0029] When the force applying element 61 is not abutted against the pushing rod 10 to provide force after rotating around the rotating axle 61a (that is, the force applying element 61 rotates from the position shown in FIG. 2 to the position shown in FIG. 1), the developing unit 41 may rotate around the rotating axle 46b under the action of the elastic element 95 and be restored to the state shown in FIG. 1; the ejection rod 30 may be pushed by the developing unit 41 to rotate around the rotating axle 30a (rotate along the direction opposite to the direction indicated by an arrow C in FIG. 2), and drive the rotating rod 20 to rotate around the rotating axle 20a (rotate along the direction opposite to the direction indicated by an arrow B in FIG. 2); finally, the pushing rod 10 may move along the direction opposite to an arrow A in FIG. 2, and finally the developing unit 41 and the control unit may be restored to the state shown in FIG. 1.

Embodiment 2

[0030] In addition to using the solution shown in exemplary embodiment one, the control unit may also adopt the solution in one embodiment. Therefore, the structural features and working manners in one embodiment same as those in exemplary embodiment one may not be described in detail herein.

[0031] As shown in FIG. 3, the control unit may include a first gear element 40, a second gear element 50, and a third gear element 60; the first gear element 40, the second gear element 50, and the third gear element 60 may all be disposed with gears; the first gear element

40, the second gear element 50, and the third gear element 60 may all be disposed on the photosensitive unit 31; the first gear element 40 may be disposed with a swing rod 40a which may control the rotation of the first gear element 40; the gear on the second gear element 50 may mesh with the gear on the first gear element 40 to transmit force; the gear on the third gear element 60 may mesh with the gear on the second gear element 50 to transmit force; and the third gear element 60 may be disposed with a cam portion 60a which may rotate with the third gear element 60.

[0032] As shown in FIG. 3, when the force applying element 61 is not abutted against the swing rod 40a, the control unit may be in the state shown in FIG. 3, and a cam portion 60a may not be abutted against the developing unit 41 or may not provide the developing unit 41 with a force away from the photosensitive unit 31. At this point, the developing unit 41 may move close to the photosensitive unit 31 under the action of the elastic element 95, and the developing element 42 may be in contact with the photosensitive element 32.

[0033] When the force applying element 61 rotates around the rotating axle 61a and is abutted against the swing rod 40a, the force applying element 61 may rotate the swing rod 40a from the state shown in FIG. 3 to the state shown in FIG. 4, and the first gear element 40 may be driven by the swing rod 40a to rotate along a direction E shown in FIG. 4; and the first gear element 40 may drive the second gear element 50 to rotate along a direction F in FIG. 4, and the third gear element 60 may be driven by the second gear element 50 to rotate along a direction G in FIG. 4. Since the cam portion 60a can rotate with the third gear element 60 together, the cam portion 60a may rotate to the position shown in FIG. 4 and provide the developing unit 41 with a force away from the photosensitive unit 31, such that the developing unit 41 may rotate around the rotating axle 46b to the state shown in FIG. 4. At this point, the developing unit 41 may be away from the photosensitive unit 31, and the developing element 42 may be not in contact with the photosensitive element 32 (i.e., separation). It can be seen from FIG. 4 that the position on the developing unit 41 being abutted against the cam portion 60a may be located on the other side of the rotating axle 46b relative to the swing rod 40a; and the force received at such position may make the developing unit 41 rotate around the rotating axle 46b along an H direction shown in FIG. 4.

[0034] When the force applying element 61 is rotated from the state shown in FIG. 4 to the state shown in FIG. 3, the force applying element 61 may no longer be abutted against the swing rod 40a; the developing unit 41 may move close to the photosensitive unit 31 under the action of the elastic element 95 and press the cam portion 60a, such that the cam 60a may rotate along the direction opposite to the G direction in FIG. 4 to the state shown in FIG. 3; at this point, the third gear element 60 may drive the first gear element 40 through the second gear element 50 and restore the swing rod 40a to the state

shown in FIG. 3.

[0035] When the force applying element 61 is rotated from the state shown in FIG. 4 to the state shown in FIG. 3, in order to restore the control unit from the state shown in FIG. 4 to the state shown in FIG. 3, a torsion spring may also be disposed on the first gear element 40, the second gear element 50, or the third gear element 60 in one embodiment. The torsion spring may provide an elastic restoring force for the first gear element 40, the second gear element 50, or the third gear element 60, such that the first gear element 40, the second gear element 50 or the third gear element 60 may be restored from the state shown in FIG. 4 to the state shown in FIG. 3.

15 Embodiment 3

[0036] The structures, connection relationships and working manners in one embodiment which are same as those in exemplary embodiment one may not be repeated herein.

[0037] As shown in FIG. 5, a second force applying element A60, a door cover 12, a supporting element 13, and a ground 11 may be disposed on the electronic image-forming device. The force applying element 60 may be in a "hook" shape (e.g., an L-shape); the door cover 12 and the supporting element 13 may be connected by a hinge, and the door cover 12 may rotate around a rotating axle 12a on the electronic image-forming device; the processing cartridge may be supported by the supporting element 13 after being installed on the electronic image-forming device; the bottom portion 11 may be disposed under both the electronic image-forming device and the supporting element 13. As shown in FIG. 5, the control unit may include a first connecting rod 70, a first gear 70a, a second connecting rod 80, and a second gear 80a. The first connecting rod 70, the first gear 70a, the second connecting rod 80, and the second gear 80a may all be disposed on the developing unit 41 and located on the axial side of the developing element 42 on the processing cartridge. A rack may be disposed on each of the first connecting rod 70 and the second connecting rod 80; the rack on the first connecting rod 70 may mesh with the first gear 70a; and the rack on the second connecting rod 80 may mesh with the second gear 80a. The first gear 70a may mesh with the second gear 80a, and the diameter of the second gear 80a may be larger than the diameter of the first gear 70a. When the processing cartridge is installed on the electronic image-forming device, the second connecting rod 80 may be located below the first connecting rod 70, and at least a portion of the second connecting rod 80 may extend out of the developing unit 41.

[0038] As shown in FIG 5, after the processing cartridge is installed on the electronic image-forming device, the processing cartridge may be supported by the supporting element 13, and the second connecting rod 80 may pass through the supporting element 13 and extend out downwardly. However, the first connecting rod 80

may not be abutted against the bottom portion 11 to receive the pushing force from the bottom portion 11. At this point, the first connecting rod 70 may not be in contact with the second force applying element A60 to receive the driving force from the second force applying element A60 (no overlapped portion along the horizontal direction). At this point, the developing element 42 and the photosensitive element 32 may be in contact with each other under the action of the elastic element 95.

[0039] As shown in FIG. 6, when the door cover 12 is rotated along the direction of an arrow I in FIG. 6, since the door cover 12 rotates around the rotating axle 12a, the door cover 12 may drive the supporting element 13 to move downwardly along a direction J in FIG. 6 (move along the vertical direction) and may also drive the processing cartridge to move along the direction J. During the downward movement of the processing cartridge and the supporting element 13, the second connecting rod 80 may be abutted against the bottom portion 11, and the bottom portion 11 may push the second connecting rod 80 to move along a direction opposite to the direction J in FIG. 6, such that the second gear 80a and the first gear 70a may be driven to rotate successively, the first connecting rod 70 may be driven to move along the direction opposite to the direction J in FIG. 6, and finally the first connecting rod 70 may extend out of the developing unit 41. Furthermore, since the diameter of the second gear 80a is larger than the diameter of the first gear 70a, the distance that the first connecting rod 70 moves along the direction opposite to the direction J may be greater than the distance that the second connecting rod 80 moves along the direction opposite to the direction J, and the first connecting rod 70 may be abutted against the second force applying element A60 (having an overlapped portion along the horizontal direction) after extending out of the developing unit 41.

[0040] As shown in FIG. 7, when the second force applying element A60 on the electronic image-forming device moves along a direction K shown in FIG. 7, the first connecting rod 70 may be driven by the second force applying element A60 to rotate the developing unit 41 around the rotating axle 46b along a direction M shown in FIG. 7, such that the developing element 42 may be separated from the photosensitive element 32 (a gap L formed shown in FIG. 7).

[0041] When the second force applying element A60 on the electronic image-forming device moves along the direction opposite to the direction K in FIG. 7, the second force applying element A60 may no longer provide a force to the first connecting rod 70, the developing unit 41 may rotate along the direction opposite to the direction M in FIG. 7 under the action of the elastic element 95, such that the developing element 42 may be in contact with the photosensitive element 32.

[0042] When the door cover 12 is opened (rotates along the opposite direction to the direction I in FIG. 6), the door cover 12 may rotate around the rotating axle 12a and drive the supporting element to move along the

direction opposite to the direction J in FIG. 6, at this point, the second connecting rod 80 may be not in contact with the bottom portion 11; the second connecting rod 80 or the first connecting rod 70 may be under the action of a spring (or the first gear 70a or the second gear 80a may be under the action of a torsion spring), such that the second link 80 may move away from the inside of the developing unit 41 along the direction J in FIG. 6, the first connecting rod 70 may move close to the inside of the developing unit 41 along the direction J in FIG. 6, and finally the state in FIG. 5 may be restored. At this point, the processing cartridge may be removed from the supporting element 13.

15 Embodiment 4

[0043] In one embodiment, the structures and connection relationships on the processing cartridge same as those in exemplary embodiment two and the structures and connection relationships on the electronic image-forming device same as those in exemplary embodiment three may not be repeated herein.

[0044] As shown in FIG. 8, after the processing cartridge is installed on the electronic image-forming device, the second force applying element A60 may be located above the developing unit 41 of the processing cartridge. The control unit may include a first gear element 140, a second gear element 150, and a third gear element 160 disposed in the developing unit 41 of the processing cartridge. The first gear element 140, the second gear element 150 and the third gear element 160 may all be disposed with gears. The first gear element 140 may be disposed with a swing rod 140a which can control the rotation of the first gear element 140. The gear on the second gear element 150 may mesh with the gear on the first gear element 140 to transmit force; and the gear on the third gear element 160 may mesh with the gear on the second gear element 150 to transmit force. The third gear element 160 may be disposed with a cam portion 160a which may follow the third gear element 160 to rotate with the third gear element 160 together.

[0045] As shown in FIG. 8, after the processing cartridge is installed on the electronic image-forming device, along the horizontal direction, the swing rod 140a may partially overlap the second force applying element A60; and the developing element 42 may be in contact with the photosensitive element 32 at this point. When the second force applying element A60 moves along a direction N shown in FIG. 9, the second force applying element A60 may be abutted against the swing rod 140, the swing rod 140 may drive the first gear element 140 to rotate around its axis along a direction P shown in FIG. 9, the second gear element 150 and the third gear element 160 may rotate successively, the cam portion 160a may be driven by the third gear element 160 to rotate along the direction of an arrow P in FIG. 9. At this point, the cam portion 160a may not be abutted against the photosensitive unit 31, such that the developing element

42 may still be in contact with the photosensitive element 32.

[0046] When the swing rod 140a rotates and passes a "hook" portion of the second force applying element A60, the second force applying element A60 may not provide a force to the swing rod 140a, the first gear element 140 may rotate along a direction Q to the position shown in FIG. 10 under the action of an elastic element (e.g., a torsion spring wound on the first gear element which is not shown in FIG. 10), and at this point, the second gear element 150 and the third gear element 160 may be also driven by the elastic element to rotate successively. At this point, the cam portion 160a may not be in contact with the photosensitive unit 31, and the developing element 42 may be in contact with the photosensitive element 32.

[0047] When the second force applying element A60 moves along the direction of an arrow R shown in FIG. 11, the second force applying element A60 may drive the swing rod 140a to rotate along the direction Q shown in FIG. 11, the second gear element 150 and the third gear element 160 may rotate respectively, and the third gear element may rotate along the direction Q shown in FIG. 11. Therefore, the cam portion 160a may press the photosensitive unit 31 and make the developing unit 41 rotate around the rotating axle 46b, and the developing element 42 may be not in contact with the photosensitive element 32 (separation) at this point. When the second force applying element A60 continues to move along the direction R, the swing rod 140a may be separated from the second force applying element A60, and the developing unit 41 may be restored to the state shown in FIG. 8 under the action of the elastic element 95. At this point, the processing cartridge may be removed from the electronic image-forming device.

[0048] In one embodiment, one elastic element may also be disposed on the swing rod 140a. When the swing rod 140a is separated from the second force applying element A60, the swing rod 140a may also be restored to the state shown in FIG. 8 under the action of the one elastic element (e.g., a torsion spring wound on the first gear element which is not shown in FIG. 11).

[0049] The rotating axles of the first gear element 140, the second gear element 150 and the third gear element 160 may all be in parallel with the axial direction of the developing element 42.

Embodiment 5

[0050] In one embodiment, the structures and connection relationships on the processing cartridge same as those in exemplary embodiment one and the structures and connection relationships on the electronic image-forming device same as those in exemplary embodiment four may not be repeated herein.

[0051] As shown in FIG. 12, the developing unit 42 on the processing cartridge may be disposed with a pushing rod 110 and an ejection rod 120. The pushing rod 110

may be disposed with a rotating axle 110a, and the ejection rod 120 may be disposed with a rotating axle 120a, and the pushing rod 110 and the ejection rod 120 may be connected through a hinge 110b. The pushing rod 110 and the ejection rod 120 may both be disposed on the developing unit 41. One end of the ejection rod 120 may be connected with the pushing rod 110, and the other end of the ejection rod 120 may extend toward the photosensitive unit 31. The pushing rod 110 may extend out of the developing unit 41.

[0052] When the second force applying element A60 moves along a direction S shown in FIG. 13, the second force applying element A60 may be abutted against the pushing rod 110 and make the pushing rod 110 rotate around the rotating axle 110a along a direction T shown in FIG. 13, the pushing rod 110 may drive the ejection rod 120 to rotate, and the other end 120b of the ejection rod 120 may move away from the photosensitive unit 31.

[0053] The inner side of the "hook" portion of the second force applying element A60 may be abutted against the pushing rod 110, and when the second force applying element A60 moves along a direction X shown in FIG. 14, the second force applying element A60 may drive the pushing rod 110 to rotate along a direction Y shown in FIG. 14. At this point, the ejection rod 120 may be driven to rotate, and the other end 120b of the ejection rod may press the photosensitive unit 31, such that the developing unit 41 may rotate around the rotating axle 46b, and the developing element 42 may move away from the photosensitive element 32.

[0054] After the second force applying element A60 is separated from the pushing rod 110, the pushing rod 110 may be restored to the state shown in FIG. 12 under the action of an elastic element (e.g., a spring or a torsion spring) or under the action of the elastic element 95.

Embodiment 6

[0055] In one embodiment, the structures and connection relationships on the processing cartridge same as those in exemplary embodiment four and the structures and connection relationships on the electronic image-forming device same as those in exemplary embodiment four may not be repeated herein.

[0056] As shown in FIG. 15, the developing unit 41 of the processing cartridge may be disposed with a first pressing rod 240, a second gear element 250, and a third gear element 260. The first pressing rod 240 may be disposed with a rack portion 240a which meshes with the second gear element 250, and the second gear element 250 may mesh with the third gear element 260. The third gear element 260 may be disposed with a cam portion 260a; the first pressing rod 240, also provided with an inclined surface, may extend out of the developing unit 41.

[0057] When the processing cartridge is installed on the electronic image-forming device, the inclined surface on the first pressing rod 240 may be abutted against the

second force applying element A60 on the electronic image-forming device, and the second force applying element A60 may make the first pressing rod 240 move along a direction a in FIG. 15 (the first pressing rod 240 may move into the developing unit 41). Since the rack portion 240a on the first pressing rod 240 meshes with the second gear element 250 and also the second gear element 250 meshes with the third gear element 260, the movement of the first pressing rod 240 along the direction a may be transformed into the rotation of the third gear element 260 along a direction b in FIG. 15 through the second gear element 250 and the third gear element 260. Therefore, the cam portion 260a on the third gear element 260 may mesh with the photosensitive unit 31, and the developing unit 41 may rotate around the rotating axle 46b. In such way, the developing unit 41 may move away from the photosensitive unit 31, such that the developing element 42 may not be in contact with the photosensitive element 32.

[0058] When the inclined surface on the first pressing rod 240 on the processing cartridge no longer meshes with the second force applying element A60, the developing unit 42 may move close to the photosensitive unit 31 under the elastic force of the elastic element 95. At this point, the photosensitive unit 31 may be abutted against the cam portion 260a and the first pressing rod 240 may be restored to the state shown in FIG. 15 through the third gear element 260, the second gear part 250, and the rack portion 240a (i.e., the first pressing rod 240 may move along a direction extending out of the developing unit 41).

[0059] In one embodiment, in order to better enable the first pressing rod 240 to extend out of the developing unit 41, an elastic element may also be disposed on the first pressing rod 240. The elastic element may provide an elastic restoring force for the first pressing rod 240, such that the first pressing rod 240 may always be subjected to an elastic restoring force to extend out of the developing unit 41.

Embodiment 7

[0060] In one embodiment, the structures and connection relationships on the processing cartridge same as those in exemplary embodiment five and the structures and connection relationships on the electronic image-forming device same as those in exemplary embodiment five may not be repeated herein.

[0061] As shown in FIG. 16, the developing unit 41 of the processing cartridge may be disposed with the first pressing rod 240 and a second ejection rod 210. The first pressing rod 240 may move along the direction a shown in FIG. 16 on the developing unit 41, and the inclined surface may be disposed on the first pressing rod 240. The second ejection rod 210 may rotate around the rotating axle 210a disposed on the developing unit along a direction c shown in FIG. 16.

[0062] When the processing cartridge is installed on

the electronic image-forming device, the inclined surface on the first pressing rod 240 may be abutted against the second force applying element A60 on the electronic image-forming device to move the first pressing rod 240 into the developing unit 41 along the direction a shown in FIG. 16. Therefore, the first pressing rod 240 may be abutted against the second ejection rod 210 to make the second ejection rod 210 rotate around the rotating axle 210a along the direction c shown in FIG. 16, such that the second ejection rod 210 may be abutted against the photosensitive unit 31. After being abutted against the photosensitive unit 31, the second ejection rod 210 may make the developing unit 41 rotate around the rotating axle 46b, such that the developing unit 41 may move away from the photosensitive unit 31.

[0063] When the first pressing rod 240 is no longer in contact with the second force applying element A60, the developing unit 41 may move close to the photosensitive unit 31 under the action of the elastic element 95. Therefore, the second ejection rod 210 may rotate around the rotating axle 210a along the direction opposite to the direction c and drive the first pressing rod 240 to move along the direction opposite to the direction a shown in FIG. 16, thereby moving the first pressing rod 240 along the direction away from the developing unit 41.

[0064] In one embodiment, in order to better enable the first pressing rod 240 to extend out of the developing unit 41, an elastic element may also be disposed on the first pressing rod 240. The elastic element may provide an elastic restoring force for the first pressing rod 240, such that the first pressing rod 240 may always be subjected to an elastic restoring force to extend out of the developing unit 41.

Embodiment 8

[0065] FIGS. 17-27 illustrates another embodiment of the present disclosure. The structures of the processing cartridge and the electronic image-forming device in one embodiment may be different from those in the above-mentioned embodiments.

[0066] As shown in FIG. 17, the electronic image-forming device is described in the patent US9836020B2. The electronic image-forming device may be disposed with a spacing element 71 and a spring 73. The spacing element 71 may rotate around a supporting axle 74, and the spring may provide an elastic restoring force to the spacing element 71, such that the spacing element 71 may always maintain an upwardly extending state as shown in FIG. 17. The working manner of the electronic image-forming device has been described in the patent US9836020B2. The processing cartridge may include the developing unit 41 and the photosensitive unit 31; the photosensitive unit 31 may be disposed with the photosensitive element 32; and the developing unit 41 may be disposed with the developing element 42 and a protrusion 44d. When the protrusion 44d meshes with the spacing element 71, and the spacing element 71 makes the protrusion drive the

developing unit 41 to rotate around the rotating axle 46b on the developing unit 41, the developing element 42 may move away from the photosensitive element 32. When the spacing element 71 does not mesh with the protrusion 44d, the developing unit 41 may rotate around the rotating axle 46b under the action of the elastic element 95, and the developing element 42 may move close to the photosensitive element 32 and finally be in contact with the photosensitive element 32.

[0067] As shown in FIG. 17, when the protrusion 44d is configured as the structure shown in FIG. 17, the protrusion 44d may provide a force F1 to the spacing element 71. The two components of the force F1 are F_{1x} and F_{1y} , respectively, and F_{1y} may make the spacing element 71 have a tendency to move downwardly as shown in FIG. 17, such that there is a risk of causing the spacing element 71 to de-mesh with the protrusion. The structural arrangement of the processing cartridge and protrusion in one embodiment may be to solve the above-mentioned risk. The solutions in one embodiment may be described as the following.

The first solution in one embodiment

[0068] FIGS. 18a-21b illustrate the first solution in one embodiment.

[0069] As shown in FIGS. 18a and 18b, the protrusion 44d and a force receiving element 45 may be disposed on the processing cartridge; a blocking element 44b and a sliding trench 44c may also be disposed on the protrusion 44d; and the force receiving element 45 may be disposed with an inclined surface 45a, a rotating axle 45b, and a force receiving surface 45c.

[0070] The rotating axle 45b of the force receiving element 45 may be connected to the sliding trench 44c, and the rotating axle 45b may move up and down in the sliding trench 44c. As shown in FIGS. 18a and 18b, the force receiving element 45 may rotate around the rotating axle 45b, and the gravity center of the force receiving element 45 may be away from the rotating axle 45b and close to the blocking element 44b (having a clockwise rotation tendency). Therefore, the blocking element 44b may be abutted against the force receiving surface 45c (to prevent the force receiving element 45 from rotating clockwise) and ensure that the force receiving surface 45c may be in a vertical state when the processing cartridge is installed in the electronic image-forming device. The inclined surface 45a on the force receiving element 45 may be disposed at a lower side along its vertical direction; and the force receiving surface 45c may mesh with the spacing element 71 and receive the pushing force from the spacing element 71.

[0071] When the processing cartridge is installed in the electronic image-forming device along the direction indicated by an arrow in FIG. 18a, the force receiving element 45 may be installed to the right side of the spacing element 71, where the inclined surface 45a may be not in contact with the spacing element 71 at this point; and

since the force receiving element 45 is under the action of the blocking element 44b, the force receiving surface 45c may be in a vertical state.

[0072] When the spacing element 71 moves along an arrow direction shown in FIGS. 19a and 19b, the spacing element 71 may be abutted against the inclined surface 45a to make the force receiving element 45 rotate around the rotating axle 45b, and the rotating axle 45b may slide upwardly along the sliding trench 44c, such that the blocking element 44b may be disengaged to be not in contact with the force receiving surface 45c. At this point, although the spacing element 71 is subjected to the gravity from the force receiving element 45, the force receiving element 45 may not overcome the elastic force of the spring 73 due to the limited weight of the force receiving element 45, such that the spacing element 71 may not rotate downwardly.

[0073] When the spacing element 71 moves to the state shown in FIGS. 20a and 20b, the spacing element 71 may be on the right side of the force receiving element 45, and at this point, the force receiving element may be restored to the state shown in FIGS. 20a and 20b under the action of gravity. At this point, the force receiving surface 45c may be in a vertical state, the rotating axle 45b may be at the lower end in the sliding trench 44c, and the force receiving element 45 may be restored to the initial state.

[0074] When the spacing element 71 moves close to the force receiving element 45 along an arrow shown in FIGS. 21a and 21b and mesh with the force receiving surface 45c, the spacing element 71 may provide a force to the force receiving element 45 to make the force receiving element 45 move to the left. Since the height of the rotating axle 45b along the vertical direction is lower than the height of the uppermost part of the spacing element 71, when the force receiving element 45 receives the force from the spacing element 71, the force receiving element 45 may not rotate counterclockwise around the rotating axle 45b as shown in FIGS. 21a and 21b. In such way, the rotating axle 45b on the force receiving element 45 may push the sliding trench 44c to make the protrusion 44d move to the left (the rotating axle 45b may rotate relative to the sliding trench 44c). Therefore, the developing unit 41 may rotate clockwise around the rotating axle 46b at this point, thereby moving the developing element 42 away from the photosensitive element 32; and the developing element 42 may rotate from a state which is in contact with the photosensitive element 32 to a state which is not in contact with the photosensitive element 32. Since the force receiving element 45 can rotate around the rotating axle 45b, during the process that the spacing element 71 pushes the force receiving element 45, the force receiving surface 45c may always be in a vertical state, and the force receiving element 45 may not provide a vertical force on the spacing element 71.

[0075] Therefore, the first solution in one embodiment may overcome the defects of the existing technology,

which may not only make the structure of the processing cartridge simple, but also may not push the spacing element on the electronic image-forming device to move the spacing element downwardly. In addition, the force receiving surface of the force receiving element may always maintain a vertical state during the process of receiving the force of the spacing element.

The second solution in one embodiment

[0076] FIGS. 22a-25b illustrate the second solution in one embodiment.

[0077] As shown in FIGS. 22a and 22b, a protrusion 144d may be disposed with a blocking element 144b and a sliding trench 144c. A force receiving element 145 may be disposed with a bottom surface 145a, a rotating axle 145b, and a force receiving surface 145c. The bottom surface 145a may be disposed at the lower side of the force receiving element 145. The rotating axle 145b may be connected to the sliding trench 144c (in the present solution, the rotating axle 145b may be configured to slide or not slide in the sliding trench 144c), and the force receiving element 145 may rotate around the rotating axle 145b. The force receiving surface 145c may be disposed on one side of the force receiving element 145. When the processing cartridge is in the state shown in FIGS. 22a and 22b, the force receiving surface 145c may be in a vertical state. The rotating axle 145 may be disposed at the left end of the force receiving element 145, such that the force receiving element 145 may tend to rotate clockwise, and the blocking element 144b may be abutted against the force receiving element 145 to prevent the force receiving element 145 from rotating clockwise.

[0078] When the processing cartridge is installed in the electronic image-forming device along the direction of an arrow shown in FIGS. 22a and 22b and the bottom surface 145a is not abutted against a spacing element 171, the force receiving surface 145c may not be subject to the force from the outside of the processing cartridge, such that the force receiving surface 145 may be in a vertical state.

[0079] As shown in FIG. 23a, the rotating axle 145b may be configured to not slide in the sliding trench 144c. When the processing cartridge continues to move downwardly along the direction of an arrow shown in FIG. 23a to the final state and cannot continue to move downwardly, the spacing element 171 may be abutted against the bottom surface 145a, and the force receiving element 145 may rotate around the rotating axle 145b to the state shown in FIG. 23a. Since the weight of the force receiving element 145 is relatively small, the force of the force receiving element 145 provided to the spacing element 171 may be less than the elastic force of the spring 173, such that the spacing element 171 may not be pushed downwardly.

[0080] As shown in FIG. 23b, the rotating axle 145b may be configured to slide in the sliding trench 144c. When the processing cartridge continues to move down-

wardly along the direction of an arrow shown in FIG. 23b to the final state and cannot continue to move downwardly, the spacing element 171 may be abutted against the bottom surface 145a, and the force receiving element 145 may move upwardly under the action of the spacer element 171. At this point, the force receiving surface 145c may still maintain a vertical state. Since the weight of the force receiving element 145 is relatively small, the force of the force receiving element 145 provided to the spacing element 171 may be less than the elastic force of the spring 173, such that the spacing element 171 may not be pushed downwardly.

[0081] As shown in FIGS. 24a and 24b, when the spacing element 171 moves to the right along the direction of an arrow shown in FIGS. 24a and 24b to the state shown in FIGS. 24a and 24b, the force receiving element 145 may be restored to the state shown in FIGS. 24a and 24b, and the force receiving surface 145c may be in the vertical state at this point.

[0082] As shown in FIGS. 25a and 25b, when the spacing element 171 moves to the left along the direction of an arrow shown in FIGS. 25a and 25b, since the height of the uppermost part of the spacing element 71 along the vertical direction is higher than the height of the rotating axle 145b along the vertical direction, the spacing element 171 may provide a force for the force receiving element 145 when the spacing element 171 is abutted against the force receiving surface 145c. Therefore, the rotating axle 145b on the force receiving element 145 may push the sliding trench 144c, and the rotating axle 145b may rotate relative to the sliding trench 144c. At this point, the developing unit 41 may rotate clockwise around the rotating axle 46b, and the developing element 42 may move away from the photosensitive element 32, such that the developing element 42 may rotate from a state which is in contact with the photosensitive element 32 to a state which is not in contact with the photosensitive element 32. Since the force receiving element 145 can rotate around the rotating axle 145b, the force receiving surface 145c may always maintain the vertical state when the spacing element 171 provides a force for the force receiving element 145, and the force receiving element 45 may not provide a vertical force to the spacing element 71.

The third solution in one embodiment

[0083] In the present solution, the structures same as those in the above-mentioned first solution and second solution may not be repeated herein.

[0084] As shown in FIGS. 26 and 27, a spacing element 271 may also be disposed with a bump 271a; a force receiving element 245 may also be disposed with a bump 245d, and the distance of the bump 271a on the spacing element extending from the spacing element 271 may be approximately same as the distance of the bump 245d on the force receiving element extending from the force receiving element 245. When the spacing element 271

is abutted against the force receiving surface 245c, the bump 271a on the spacing element may be abutted against a plane on the force receiving surface 245c, and the bump 245d on the force receiving element 245 may be abutted against a plane on the spacing element 27, such that when the spacing element 271 provides a force to the force receiving surface 245c, the force receiving surface 245c may always maintain the vertical state.

Claims

1. A processing cartridge, comprising:

a developing unit and a photosensitive unit, wherein the developing unit includes a developing element, and the photosensitive unit includes a photosensitive element; and a control unit, including a control element, wherein when the control element is close to or away from the developing unit, the developing element is away from or close to the photosensitive element.

2. The processing cartridge according to claim 1, wherein:

the control element in the control unit is configured to move between a first position and a second position;
when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is in contact with the developing element; and
when the control element is in the second position, the control element is closer to the developing unit than when the control element is in the first position, and at this point, the developing element is not in contact with the photosensitive element.

3. The processing cartridge according to claim 1, wherein:

the control element in the control unit is configured to move between a first position and a second position;
when the control element is in the first position, the control element is away from the developing unit, and at this point, the photosensitive element is close to the developing element; and
when the control element is in the second position, the control element is closer to the developing unit than when the control element is in the first position, and at this point, the developing element is away from the photosensitive element.

4. The processing cartridge according to claim 2 or 3, wherein:

the control element is disposed on the developing unit and extends out of the developing unit to receive an external force.

5. The processing cartridge according to claim 2 or 3, wherein:

the control element includes a swing rod, and the control unit includes a first gear element, a second gear element, and a third gear element, which are disposed in the developing unit; the first gear element, the second gear element, and the third gear element are all disposed with gears; the first gear element is disposed with the swing rod configured to control a rotation of the first gear element; a gear on the second gear element meshes with a gear on the first gear element to transmit force; a gear on the third gear element meshes with a gear on the second gear element to transmit force; the third gear element is disposed with a cam portion which rotates with the third gear element; and a rotation of the swing rod controls the cam portion to be abutted or be not abutted against the photosensitive unit, thereby controlling the developing element to be close to or away from the photosensitive element.

6. The processing cartridge according to claim 2 or 3, wherein:

the control unit includes a pushing rod and an ejection rod; the pushing rod is the control element; the pushing rod is provided with a rotating axle, the ejection rod is provided with a rotating axle, and the pushing rod and the ejection rod are connected with each other by a hinge; the pushing rod and the ejection rod are both disposed on the developing unit; one end of the ejection rod is connected to the pushing rod, and the other end of the ejection rod extends toward a direction of the photosensitive unit; the pushing rod extends out of the developing unit; a rotation of the pushing rod around the rotating axle of the pushing rod controls a rotation of the ejection rod, such that the pushing rod is not abutted against or does not press the photosensitive unit, thereby making the developing element close to or away from the photosensitive element.

7. The processing cartridge according to claim 2 or 3, wherein:

the control unit includes a first pressing rod, a second gear element, and a third gear element; the first pressing rod is disposed with a rack portion which meshes with the second gear element, and the second gear element meshes with the third gear element; the third gear element is disposed with a cam portion; the first pressing rod, also disposed with an inclined surface, extends out of the developing unit; the first pressing rod is the control element; and the

first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the cam portion meshes with or does not mesh with the photosensitive unit, thereby making the developing element close to or away from the photosensitive element. 5

8. The processing cartridge according to claim 2 or 3, wherein:
the control unit includes a first pressing rod and a second ejection rod; the first pressing rod is the control element; the first pressing rod is capable of moving on the developing unit; an inclined surface is disposed on the first pressing rod; the second ejection rod is configured to rotate around a rotating axle disposed on the developing unit; and the first pressing rod receives an external force to make the first pressing rod close to or away from the developing unit, such that the second ejection rod is abutted or not abutted against the photosensitive unit, thereby making the developing element close to or away from the photosensitive element. 10 15 20

25

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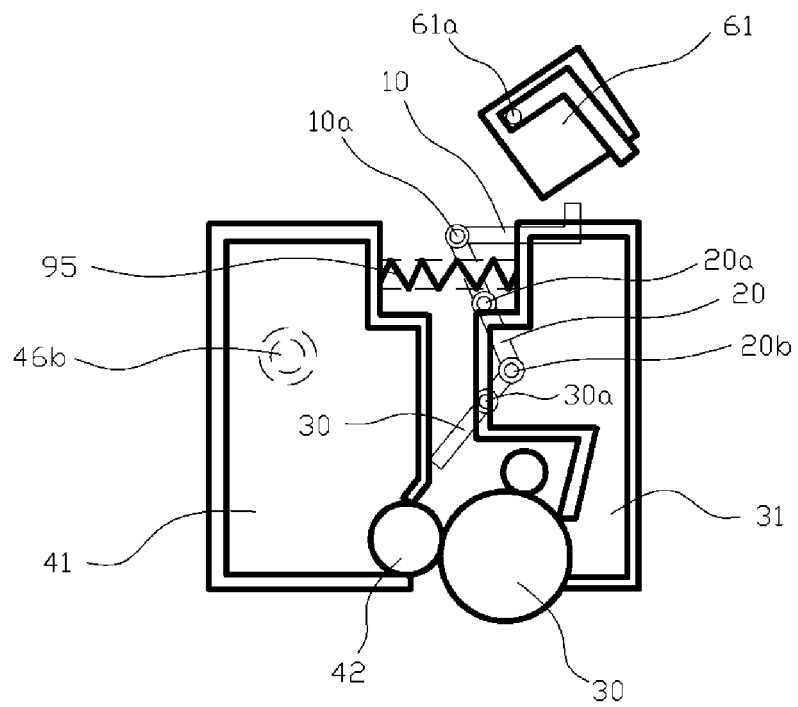


FIG. 1

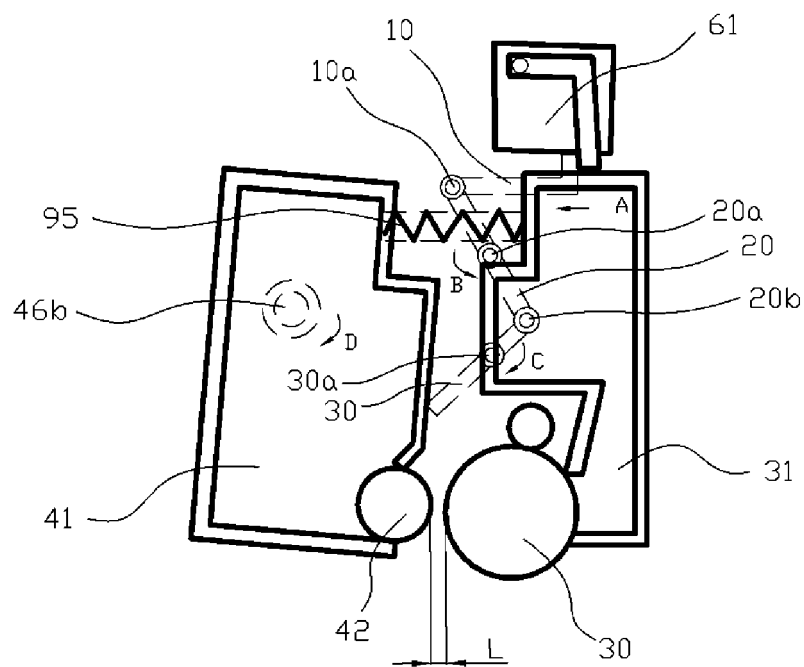


FIG. 2

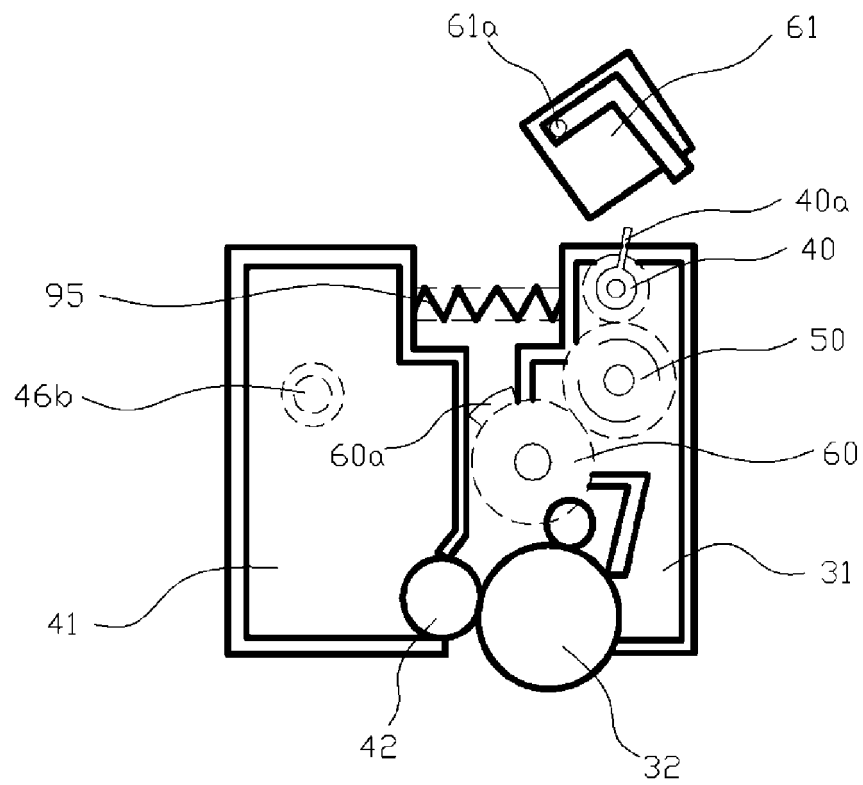


FIG. 3

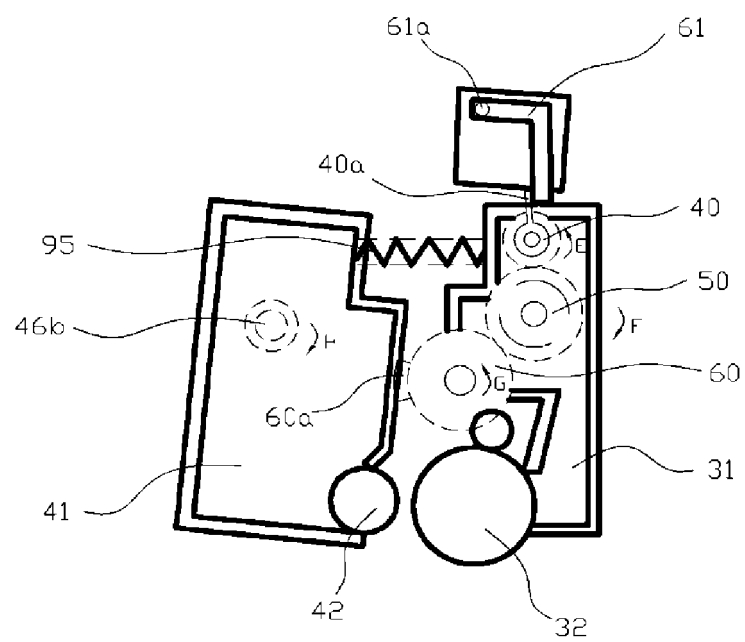


FIG. 4

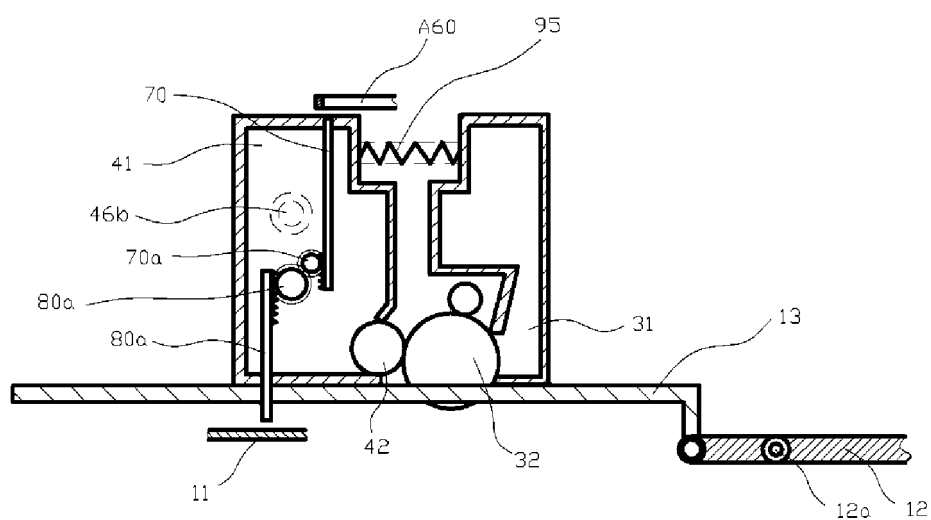


FIG. 5

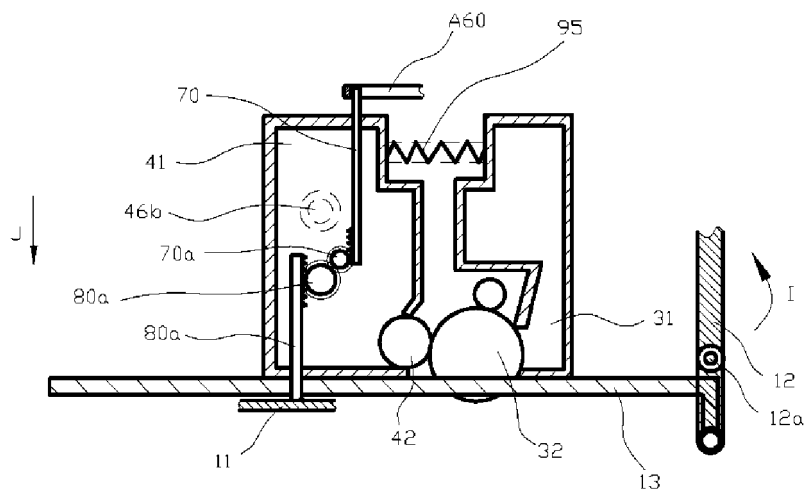


FIG. 6

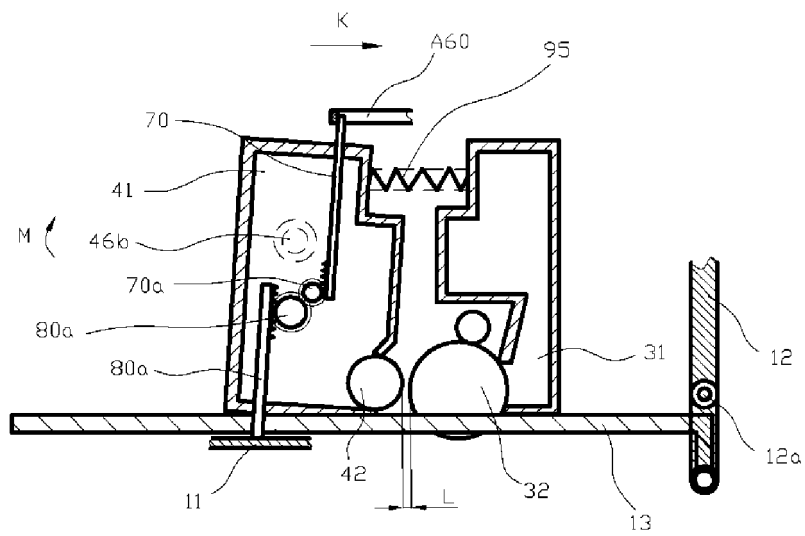


FIG. 7

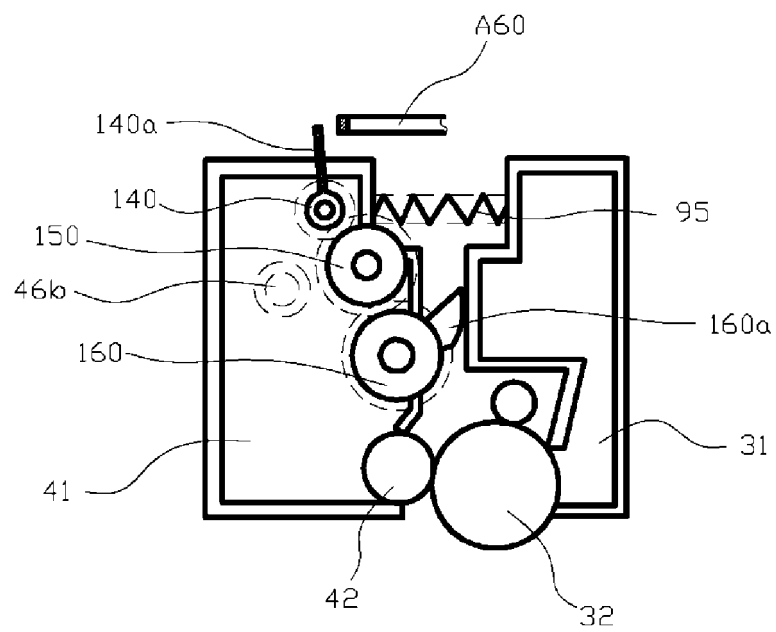


FIG. 8

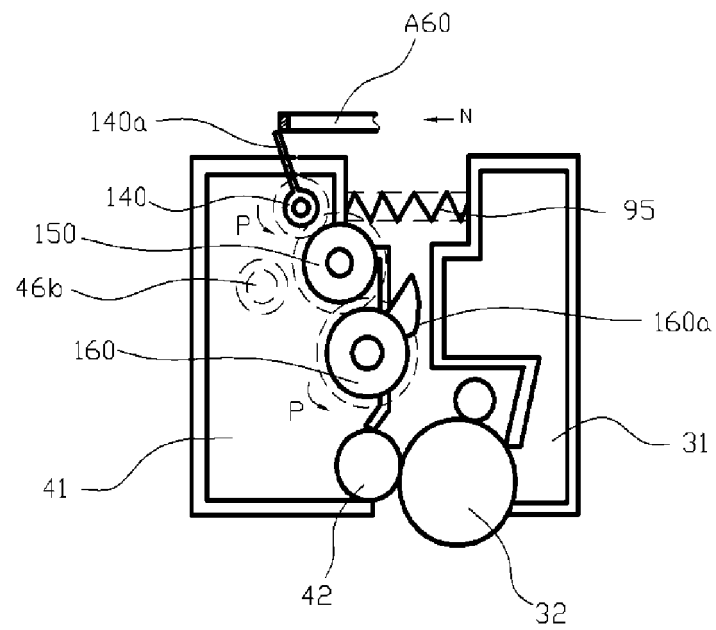


FIG. 9

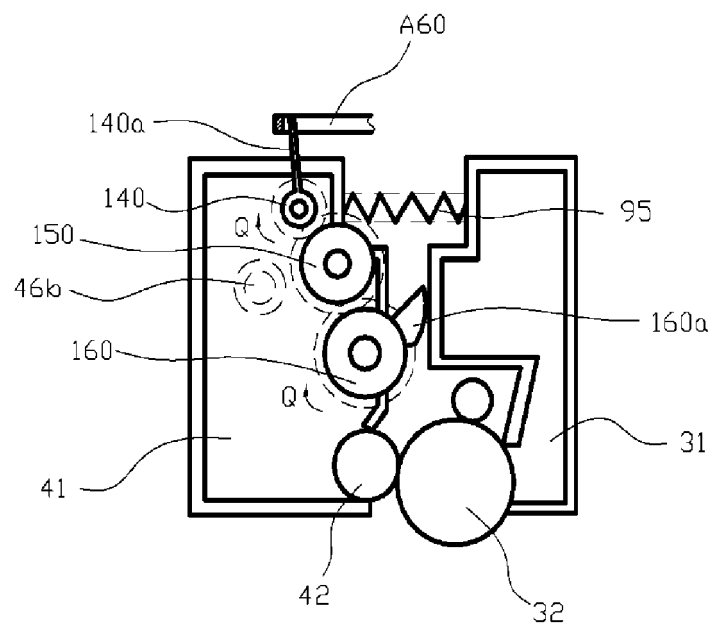


FIG. 10

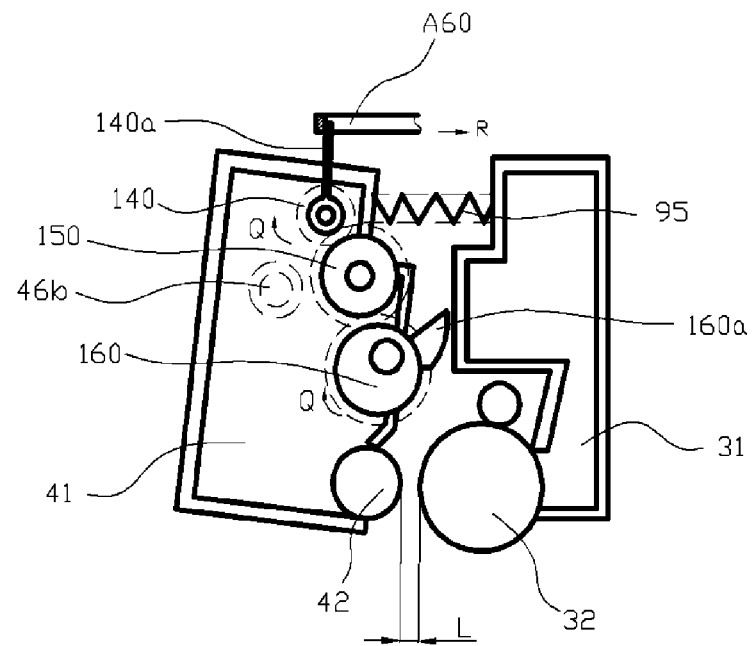


FIG. 11

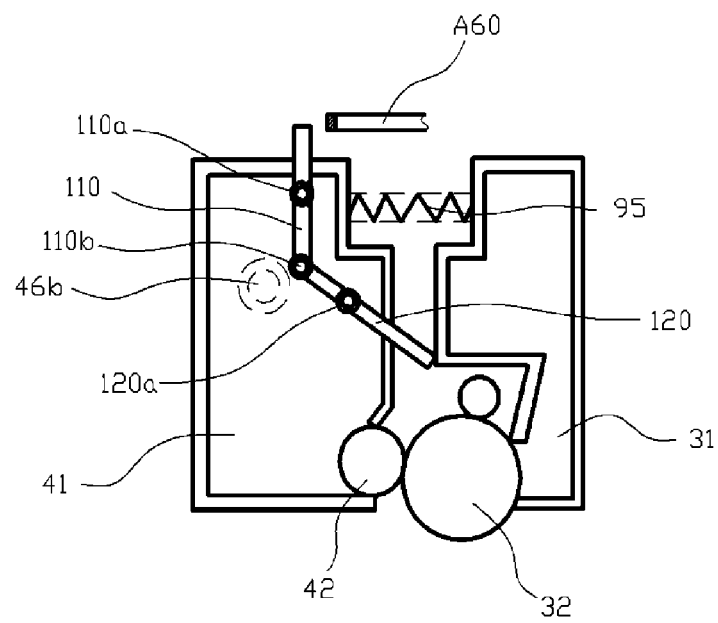


FIG. 12

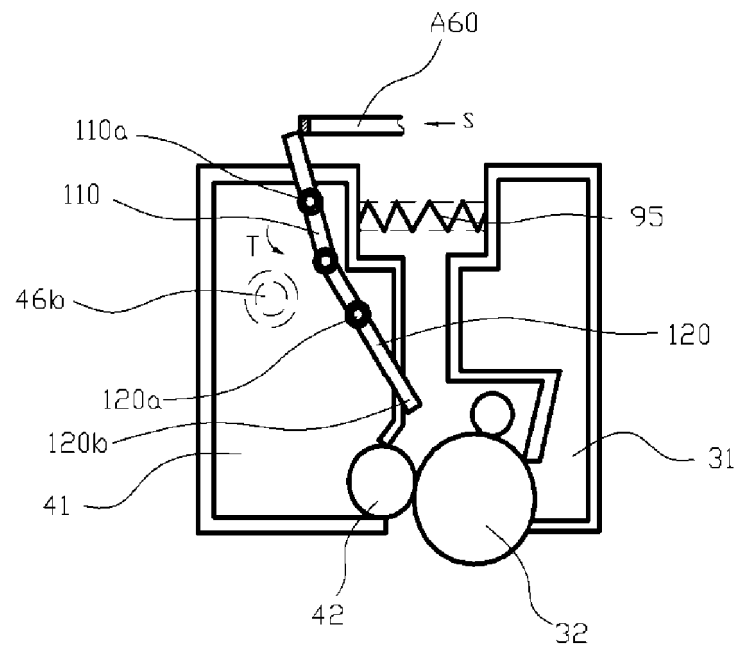


FIG. 13

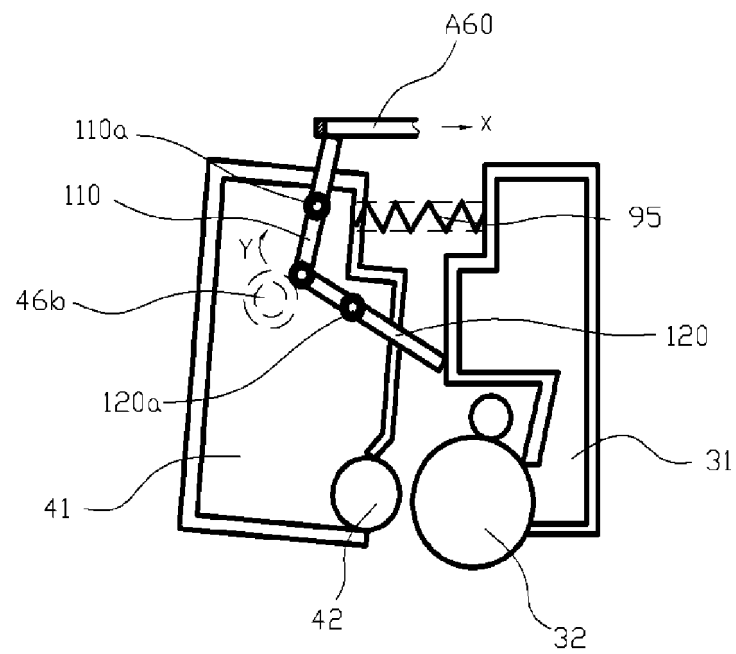


FIG. 14

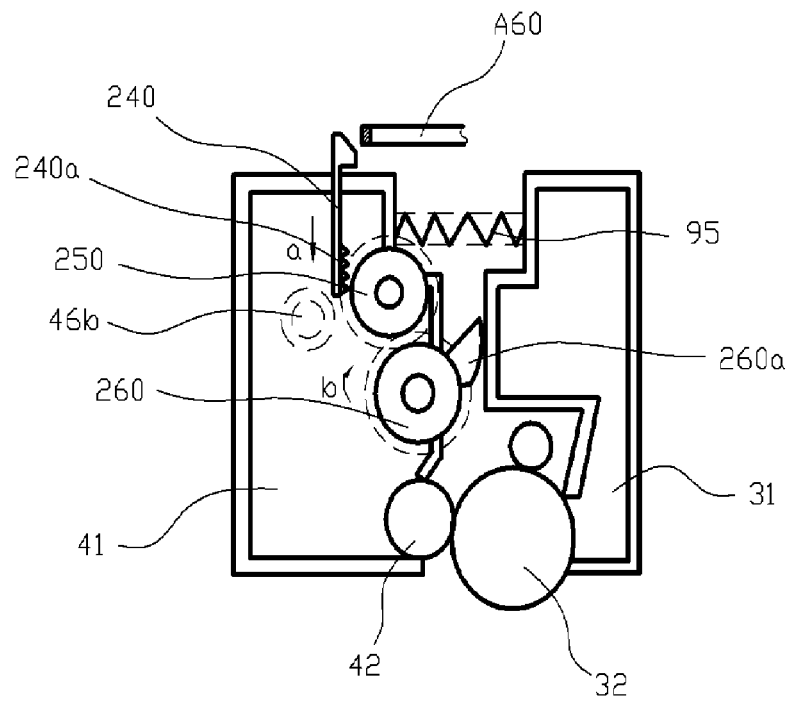


FIG. 15

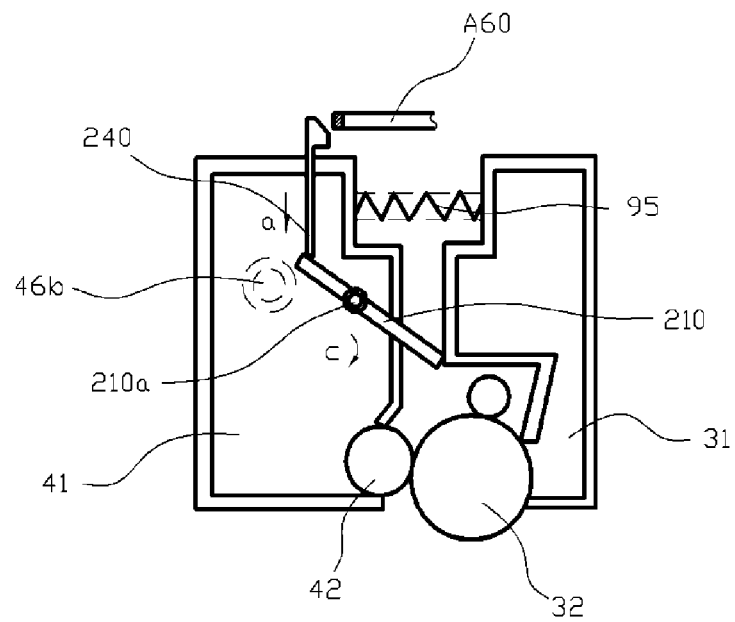


FIG. 16

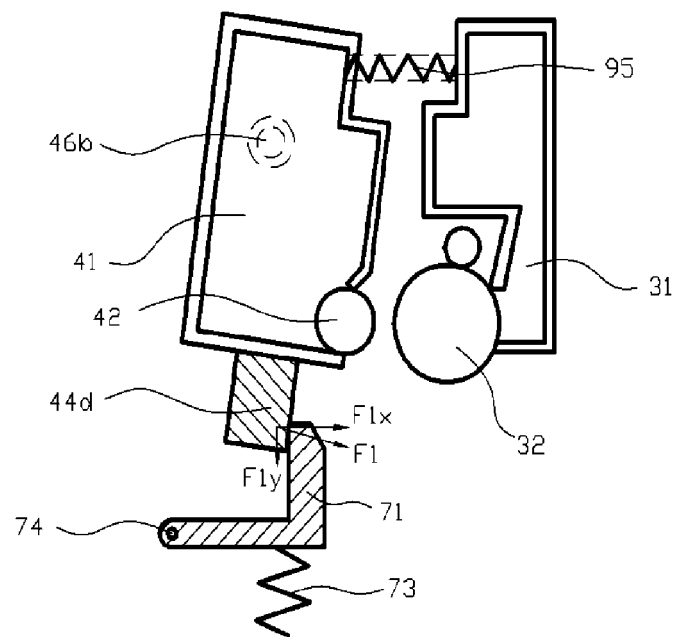


FIG. 17

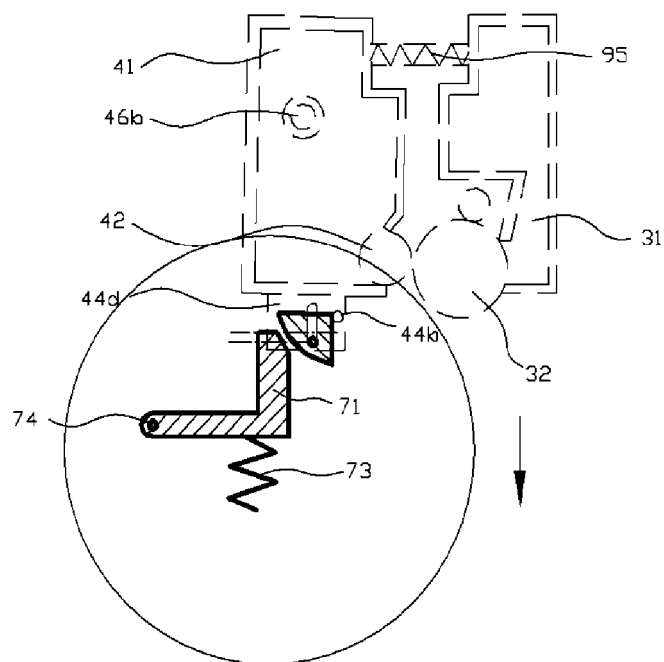


FIG. 18a

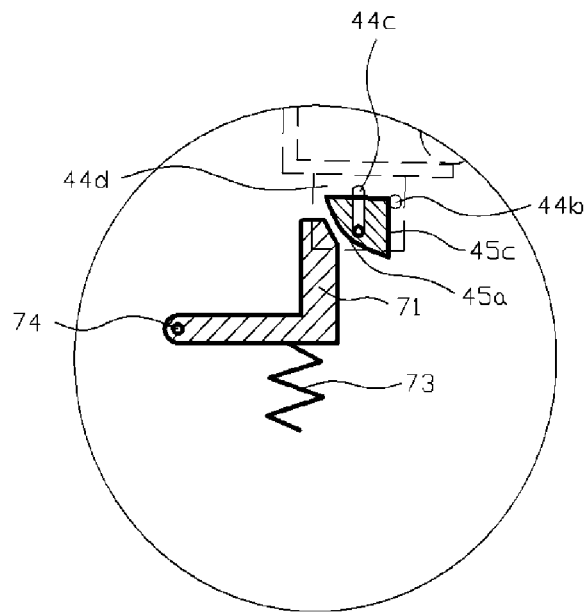


FIG. 18b

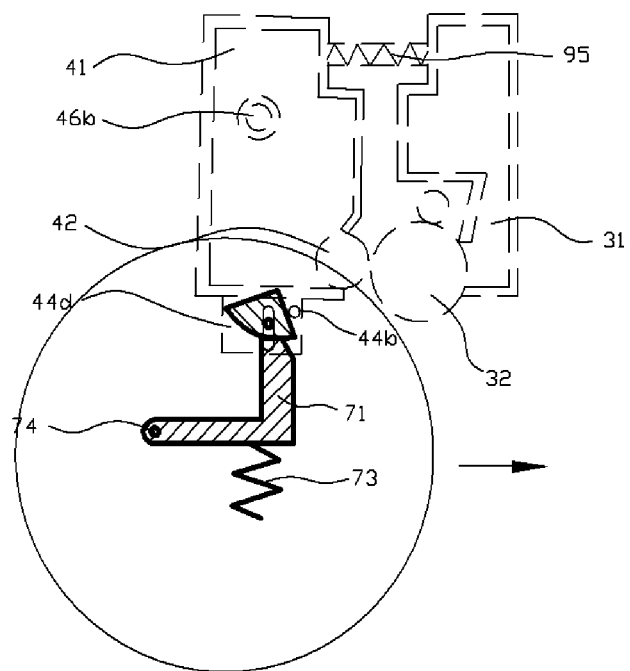


FIG. 19a

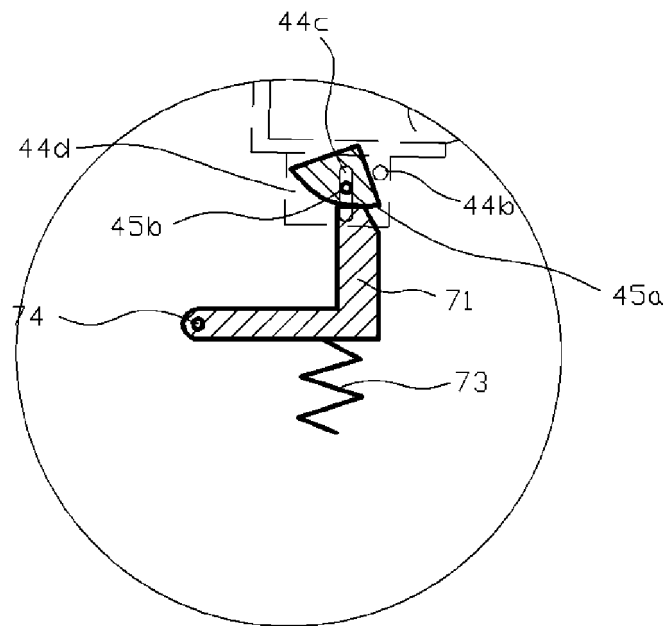


FIG. 19b

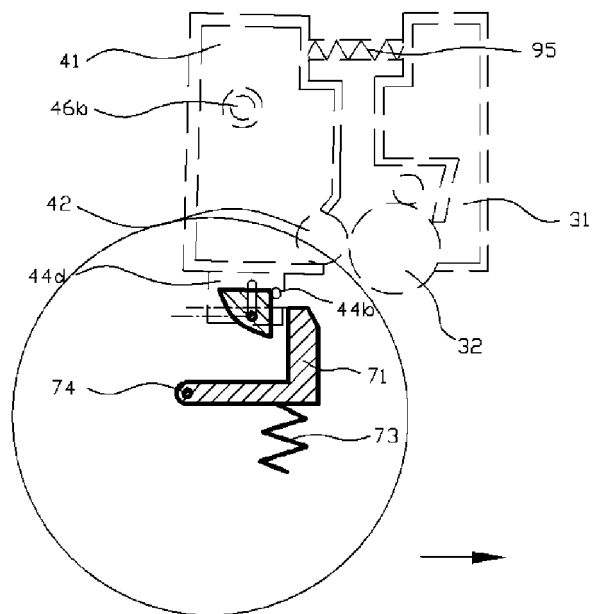


FIG. 20a

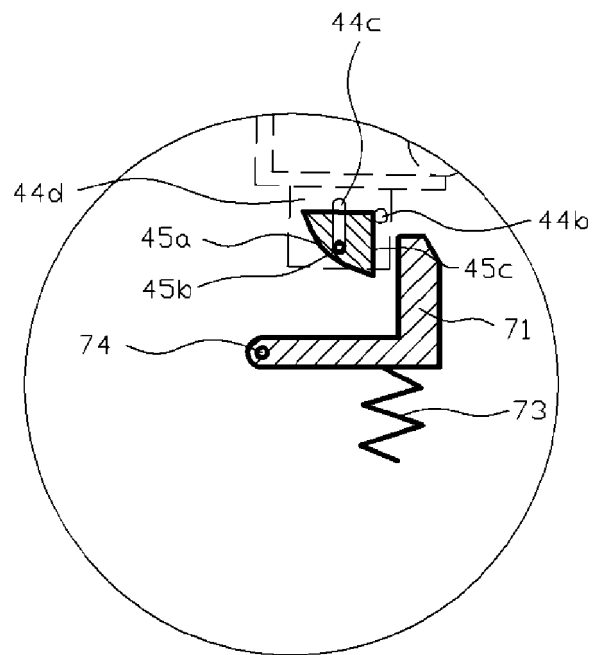


FIG. 20b

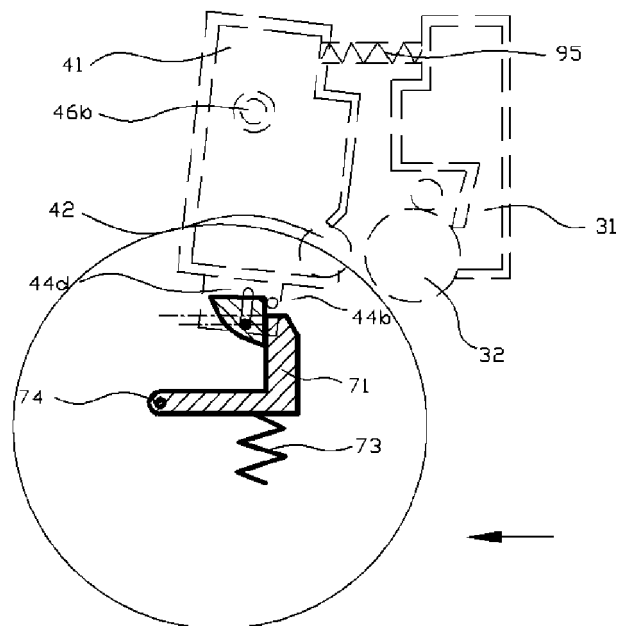


FIG. 21a

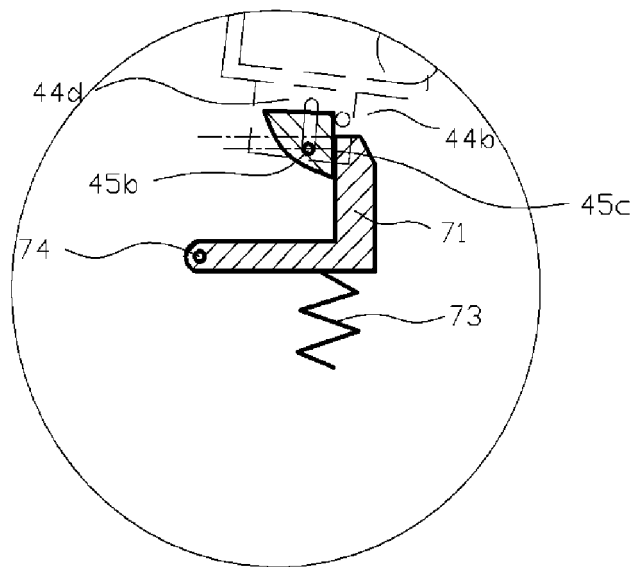


FIG. 21b

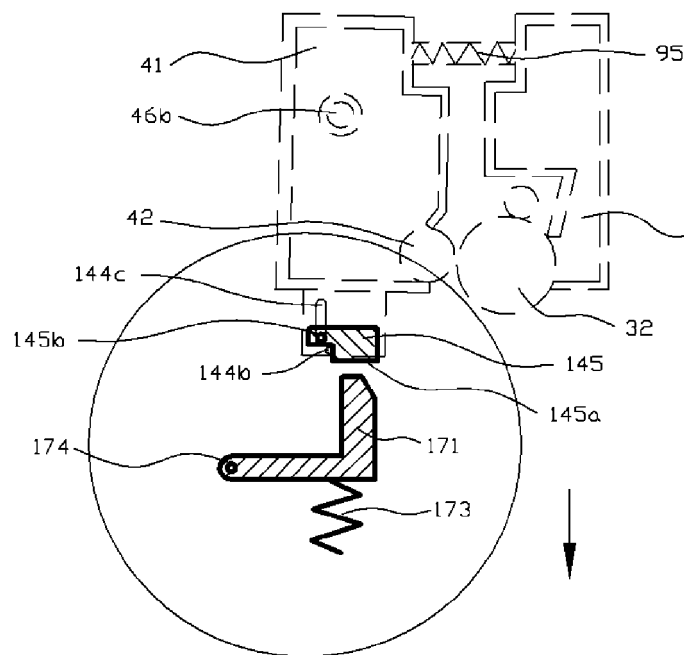


FIG. 22a

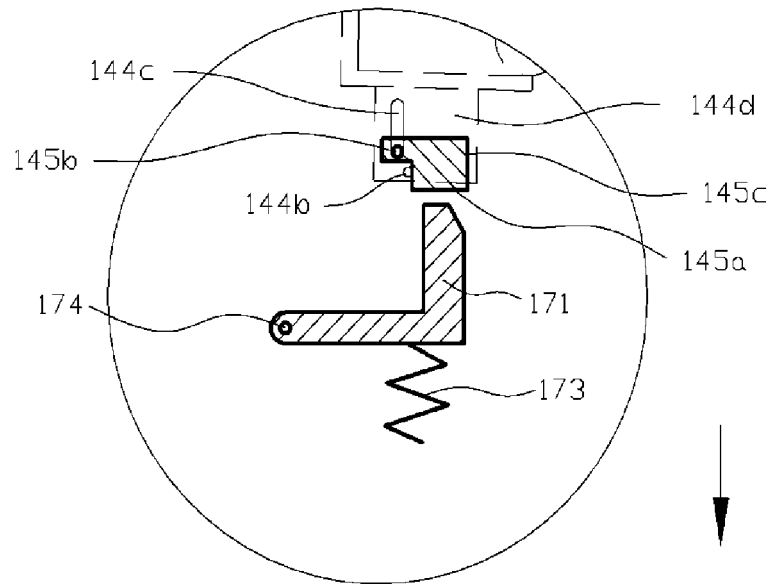


FIG. 22b

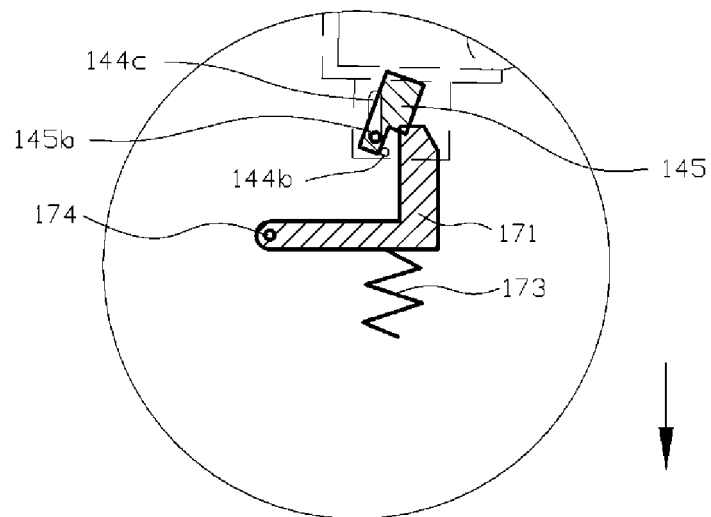


FIG. 23a

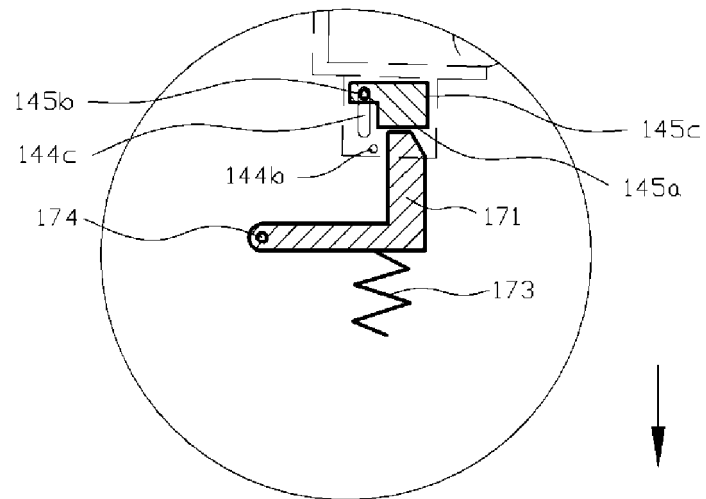


FIG. 23b

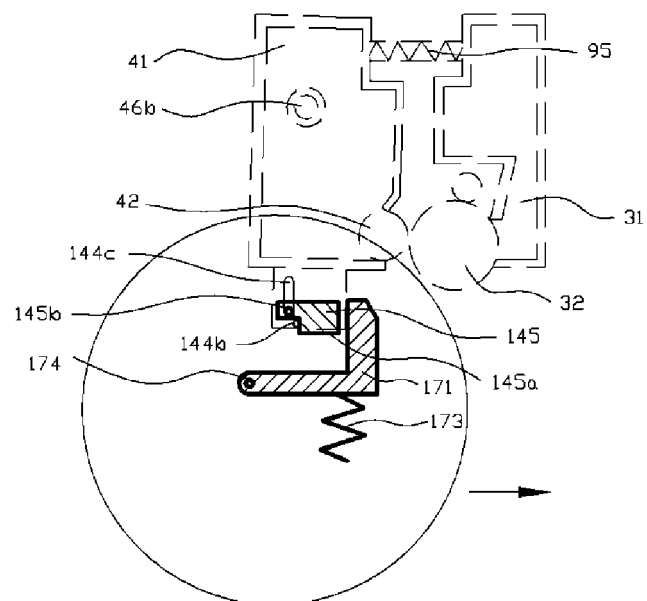


FIG. 24a

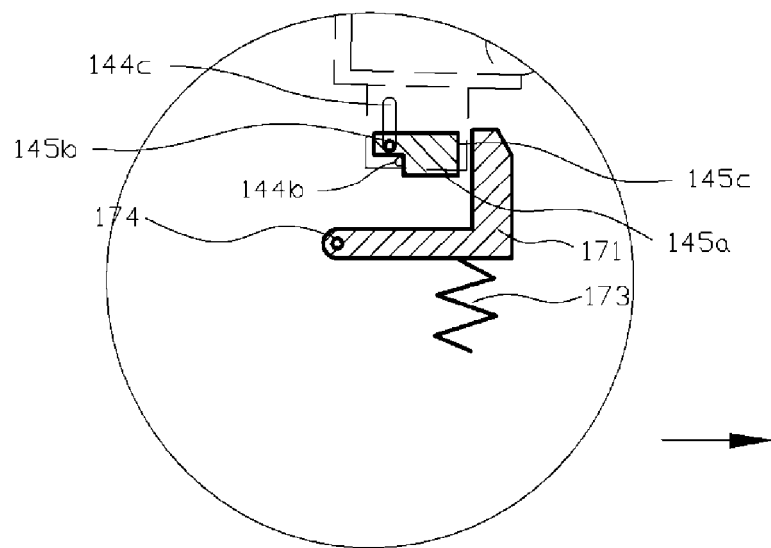


FIG. 24b

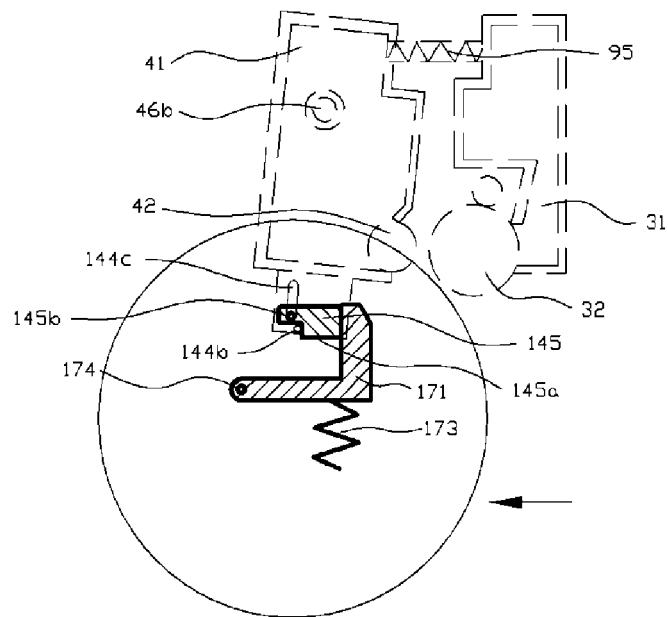


FIG. 25a

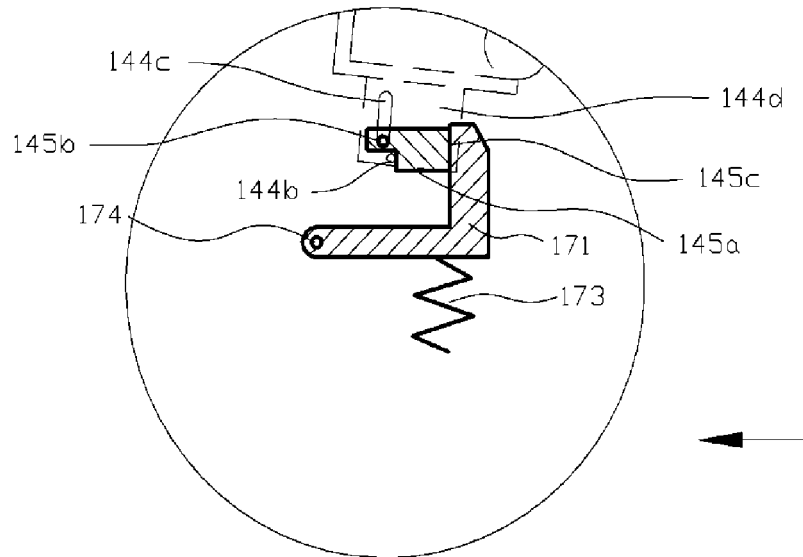


FIG. 25b

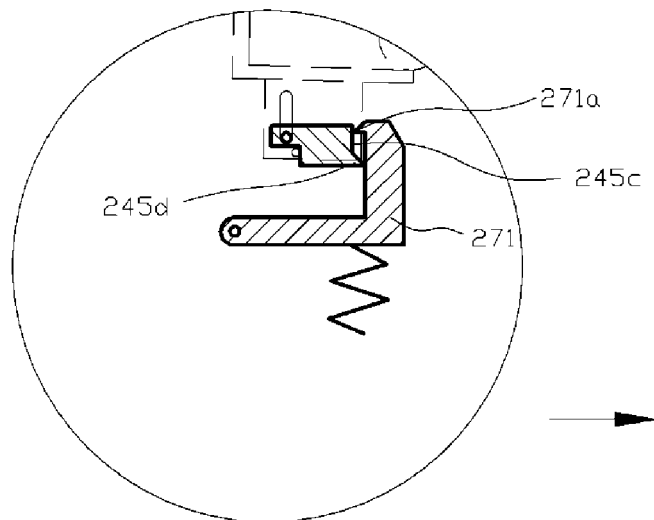


FIG. 26

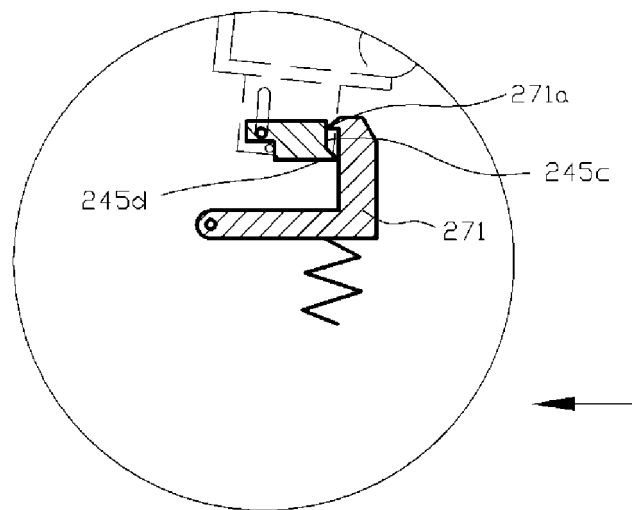


FIG. 27

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/106289

5	A. CLASSIFICATION OF SUBJECT MATTER G03G 21/18(2006.01)i; G03G 15/08(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC	
10	B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) G03G Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched	
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNPAT, CNKI, EPODOC, WPI: 卢敬坤, 李坤, 处理盒, 显影, 感光, 靠近, 接近, 接触, 远离, 分离, 分开, 移动, 杆, 齿轮, 凸轮, process cartridge, develop+, photosensitive, approach+, contact+, away, separat+, close+, mov+, lever, gear, cam	
20	C. DOCUMENTS CONSIDERED TO BE RELEVANT	
25	Category*	Citation of document, with indication, where appropriate, of the relevant passages
	X	CN 102193476 A (CANON INC.) 21 September 2011 (2011-09-21) description, paragraphs [0011]-[0012] and [0087]-[0225], and figures 1-68
	X	CN 101715570 A (CANON INC.) 26 May 2010 (2010-05-26) description, paragraphs [0037]-[0105], and figures 1-21
30	X	JP 2018097285 A (CANON K.K.) 21 June 2018 (2018-06-21) description, paragraphs [0041]-[0139], and figures 1-12
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35	A	JP 2012027449 A (CANON K. K.) 09 February 2012 (2012-02-09) entire document
40	☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.	
45	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
50	Date of the actual completion of the international search 09 December 2019	Date of mailing of the international search report 18 December 2019
55	Name and mailing address of the ISA/CN China National Intellectual Property Administration No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.

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