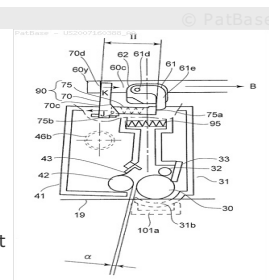
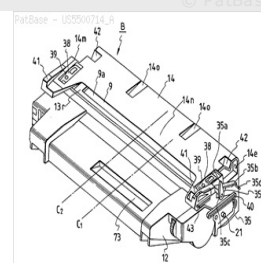


1) Family number: 34855605 (US2007160388A)**PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS**

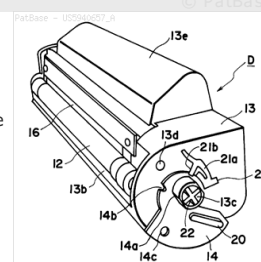
Abstract: Source: US2007160388A A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, the main assembly including an opening, a door movable between a close position for closing the opening and an open position for opening the opening, a first force application member movable with movement of the door from the open position to the closing position and a second force application member movable by a driving force from a driving source, the process cartridge includes an electrophotographic photosensitive drum; a developing roller for developing an electrostatic latent image formed on the electrophotographic photosensitive drum; a drum unit containing the electrophotographic photosensitive drum; a developing unit which contains the developing roller and which is movable relative to the drum unit such that developing roller is movable between a contact position in which the developing roller is contacted to the electrophotographic photosensitive drum and a spaced position in which the developing roller is spaced from the electrophotographic photosensitive drum; and a force receiving device including a first force receiving portion for receiving a force from the first force application member by movement of the door from the open position to the close position in the state that process cartridge is mounted to the main assembly of the apparatus through the opening, and a second force receiving portion movable from a stand-by position by movement of the first force receiving portion by a force received from the first force application member, wherein the second force receiving portion takes a projected position for receiving a force from the second force application member to move the developing unit from the contact position to the spaced position, the projected position being higher than the stand-by position.

Probable Assignee: CANON INC**Earliest Publication Date:** 20070712**2) Family number: 23276756** (US5500714A)**PROCESS CARTRIDGE, METHOD FOR ASSEMBLING PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS**

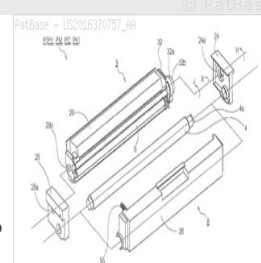
Abstract: Source: US5500714A The present invention provides a process cartridge mountable to an image forming apparatus, comprising a frame, an image bearing member, process means acting on the image bearing member, and a gripper for gripping the process cartridge. The gripper portion is provided on said frame at a position offset from a longitudinal center of the process cartridge toward a position where the frame is subjected to a greater mounting resistance generated by engagement between the process cartridge and a member on the main body, when the process cartridge is mounted to the image forming apparatus.

Probable Assignee: CANON INC**Earliest Publication Date:** 19940309**3) Family number: 30432727** (US5940657A)**DEVELOPING CARTRIDGE**

Abstract: Source: US5940657A A developing cartridge for developing a latent image formed on the photosensitive member, which is detachably mountable to a main assembly of an electrophotographic image forming apparatus, includes a cartridge frame; a developing device for developing, with toner, the latent image formed on the photosensitive member of the main assembly of the apparatus when mounted to the main assembly of the electrophotographic image forming apparatus; a driving force receptor for receiving, from the main assembly, a driving force for rotating the developing means when the cartridge is mounted to the main assembly, the driving force receptor being provided and exposed adjacent one end of the cartridge frame portion in a longitudinal direction of the developing means; a toner accommodating portion for accommodating the toner; a shutter movable between a closing position for covering a portion of the developing device exposed from the cartridge frame and an opening position for exposing the developing device; and a locking member for releasably locking the shutter at the closing position, the locking member being provided in the cartridge frame portion adjacent the one end.

Probable Assignee: CANON INC**Earliest Publication Date:** 19970910**4) Family number: 59460544** (US2016370757A)**CARTRIDGE, PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS**

Abstract: Source: US2016370757A A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, includes a rotatable photosensitive drum; a rotatable developing roller configured to develop image formed on the drum, the developing roller being capable of contacting to and spacing from the drum; an urging force receiving portion configured to receive, from a main assembly side urging member, an urging force for spacing the developing roller from the drum; a cartridge side drive transmission member capable of the coupling with a main assembly side drive transmission member and configured to receive, from the main assembly side drive transmission member, a rotational force for rotating the developing roller; and a decoupling member capable of urging the cartridge side drive transmission member by the urging force received by the urging force receiving portion to decouple the cartridge side drive transmission member from the main assembly side drive transmission member.

Probable Assignee: CANON INC

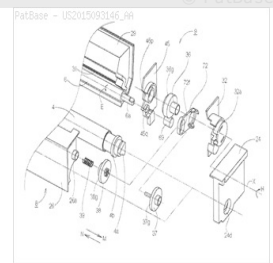
Earliest Publication Date: 20150611
5) Family number: 55376160 (US2015093146A)

CARTRIDGE, PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Abstract: Source: US2015093146A A cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, the cartridge includes (i) a rotatable developing roller for developing a latent image formed on a photosensitive member; (ii) a first drive transmission member capable of receiving a rotational force originated by the main assembly; (iii) a second drive transmission member capable of coupling with the first drive transmission member and capable of transmitting the rotational force received by the first drive transmission member to the developing roller; and (iv) a coupling disconnection member including a force receiving portion capable of receiving the force originated by the main assembly, and an urging portion capable of urging at least one of the first drive transmission member and the second drive transmission member by the force received by the force receiving portion to separate one of the first drive transmission member and the second drive transmission member from the other, thereby disconnecting the coupling.

Probable Assignee: CANON INC

Earliest Publication Date: 20131219



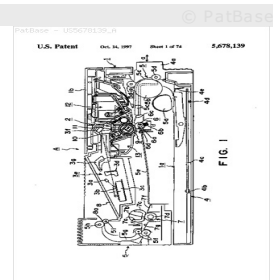
6) Family number: 9115907 (US5678139A)

PROCESS CARTRIDGE WITH SHUTTER FOR PROTECTING PHOTORESENSITIVE DRUM

Abstract: Source: US5678139A A process cartridge detachably mountable relative to a main assembly of an image forming apparatus includes an image bearing member; a process device actable on the image bearing member; an elastic device; a receptor for receiving a force against an elastic force of the elastic device in contact with the main assembly when the process cartridge is mounted to the main assembly of the image forming apparatus; where when the process cartridge is to be taken out of the main assembly of the image forming apparatus, the elastic device displaces the process cartridge by the elastic force of the elastic device.

Probable Assignee: CANON INC

Earliest Publication Date: 19941029



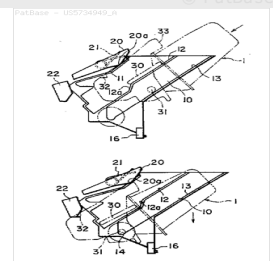
7) Family number: 15886629 (US5734949A)

PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS USABLE WITH THIS PROCESS CARTRIDGE

Abstract: Source: US5734949A A process cartridge is detachably mountable to an image forming apparatus for forming an image on a recording material. The process cartridge includes an image bearing member, a process device for acting on the image bearing member, which includes a developing device for developing an image on the image bearing member, a frame, and a projection disposed on the upper surface of the frame and extending toward the developing device, the projection having (i) an upward inclined surface, (ii) a flat surface continuing from the upper inclined surface, and (iii) a downward inclined surface that is inclined toward the developing device.

Probable Assignee: CANON INC

Earliest Publication Date: 19921230



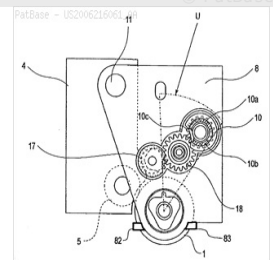
8) Family number: 33378211 (US2006216061A)

PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS

Abstract: Source: US2006216061A A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, includes an electrophotographic photosensitive drum; a developing roller for developing a latent image formed on the drum with a developer while being in contact with the drum; a drum unit for supporting the drum, wherein the drum unit is positioned relative to the main assembly when the process cartridge is set in the main assembly; a developing unit supporting the developing roller and movable together with the drum unit between a contact position in which the developing roller and the drum are in contact to each other to develop the is electrostatic latent image and a spaced position in which the developing roller and the drum are spaced away from each other; a drum driving force receiving portion, provided in the drum unit, for receiving, from the main assembly, a drum driving force for rotating the drum when the process cartridge is set in the main assembly; a movable member which is movable to move the developing unit between the contact position and the spaced position; and a movable member driving force receiving portion provided in the drum unit for receiving, from the main assembly, a movable member driving force for moving the movable member when the process cartridge is mounted in the main assembly.

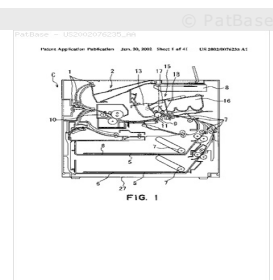
Probable Assignee: CANON INC

Earliest Publication Date: 20060927



9) Family number: 28227369 (US2002076235A)

PROCESS CARTRIDGE, ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS AND CARTRIDGE MOUNTING METHOD



Abstract: Source: US2002076235A A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, the process cartridge includes a cartridge frame; an electrophotographic photosensitive drum; a charger for charging the drum; a developing member for developing an latent image on the drum; a developer accommodating portion to be used the developing member; an engaging member for being supported by a receiving portion of a movable member provided in the main assembly when the engaging member is in the main assembly, wherein the engaging member is provided on-a portion of the cartridge frame which takes an upper position when the cartridge is inserted into the main assembly in a longitudinal direction thereof, at a downstream end position in a direction of insertion of the cartridge into the main assembly; a first guide provided on an upper portion of the frame, at such a position as takes a downstream position, wherein the first guide is guided by a fixed guide provided in the main assembly; a second guide provided on a lower portion of the frame at such a downstream position, wherein the second guide is guided by a first guide recess provided in the main assembly; a third guiding portion provided on a lower portion of the frame at such an upstream position, wherein the third guide is guided by a second guide recess; a driving force receiving member provided at a downstream end portion, wherein the driving force receiving member receives a driving force from a driving force transmitting member provided in the main assembly; and a positioning portion projected from the frame toward an upstream side in the inserting direction, wherein the positioning portion is disposed coaxially with the drum, and wherein when the engaging member supported by the receiving portion is released to permit the cartridge to lower to the mount position, the positioning portion is supported by a positioning recess provided in the main assembly.

Probable Assignee: CANON INC

Earliest Publication Date: 20020522

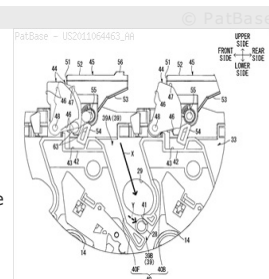
10) Family number: 48451993 (US2011064463A)

DEVELOPER CARTRIDGE

Abstract: Source: US2011064463A A developer cartridge is described. The developer cartridge detachably mountable on a tandem type photosensitive unit slidable to a drawn-out position and a mounted position with respect to an image forming apparatus body may include a casing; a developer carrier rotatably supported on one end portion of the casing for carrying a developer; a pair of upright portions arranged on another end portion of the casing at an interval from each other in the axial direction of the developer carrier to extend from another end portion of the casing in a detaching direction for the developer cartridge; and an elastically deformable coupling portion extending in the axial direction of the developer carrier for coupling the upright portions with each other.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20110316



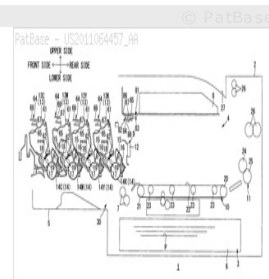
11) Family number: 48452063 (US2011064457A)

IMAGE FORMING APPARATUS AND TANDEM TYPE PHOTOSENSITIVE UNIT

Abstract: Source: US2011064457A An image forming apparatus is described. An image forming apparatus may include an image forming apparatus body and a tandem type photosensitive unit slidable with respect to the body, wherein the unit includes: a frame; a plurality of photosensitive bodies; a plurality of developer cartridges, including developer carriers, detachably mountable on the frame; and a pressing portion provided on the frame for pressing each of the cartridges so that the developer carrier thereof is directed toward the corresponding photosensitive body, each of the cartridges is pivoted to be movable to an imaging position pressed by the pressing portion and a detached position released from the pressing by the pressing portion, and the body is provided with an abutting portion abutting the cartridge located on the detached position thereby pivoting the cartridge and moving the same to the imaging position when the unit is mounted on the body.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20110316



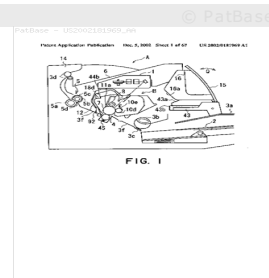
12) Family number: 23892934 (US2002181969A)

PROCESS CARTRIDGE MOUNTING AND DEMOUNTING MECHANISM, PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Abstract: Source: US2002181969A A process cartridge mounting and demounting mechanism detachably mounts a process cartridge to a main assembly of an electrophotographic image forming apparatus. The mechanism includes an opening through which the process cartridge is mounted and demounted; an opening and closing member for opening and closing the opening; a cartridge mounting member for demountably mounting the process cartridge; and a mounting member holder for movably holding the cartridge mounting member in interrelation with an operation of the opening and closing member at a first position in which the process cartridge is detachably mountable with the opening and closing member being in an open state and at a second position in which the process cartridge is capable of operation for image formation with the opening and closing member being in a closing state.

Probable Assignee: CANON INC

Earliest Publication Date: 20020918

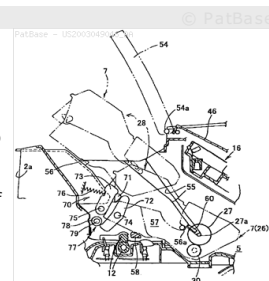


13) Family number: 28721831 (US2003049046A)

IMAGE FORMING DEVICE AND PROCESS UNIT FOR USE THEREIN

Abstract: Source: US2003049046A A developing unit is detachably mounted on a photosensitive unit to form a combined unit called process unit. In use, the process unit is loaded into an electrophotographic image forming device. A rotational shaft of the photosensitive drum projects out from the photosensitive unit. When the process unit is loaded into the image forming device from a top open space, both ends of the rotational shaft are engaged with a pair of guides formed in side walls of the image forming device and guided down along the guides. The process unit is accommodated in an accommodating section when both ends of the rotational shaft have brought into abutment with stops at the ends of the guides and a trailing end of the process unit is rotated downward about the rotational shaft.

Probable Assignee: BROTHER IND LTD



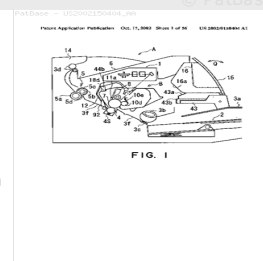
Earliest Publication Date: 20030304
14) Family number: 28316531 (US2002150404A)

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Abstract: Source: US2002150404A An electrophotographic image forming apparatus to which a process cartridge is detachably mountable, includes an opening through which the cartridge is mounted, an opening and closing member for opening and closing the opening, a main assembly side guide for supporting a cartridge guide and movable in interrelation with opening and closing of the opening and closing member, a main assembly coupling member, movable in a direction substantially perpendicular to a cartridge mounting direction for connection with a cartridge coupling member to transmit a driving force, and a driving connector for effecting connection and disconnection between the main assembly coupling member and the cartridge coupling member by moving the main assembly coupling member in interrelation with opening and closing of the opening and closing member.

Probable Assignee: CANON INC

Earliest Publication Date: 20020918



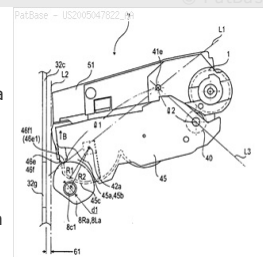
15) Family number: 31716683 (US2005047822A)

PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

Abstract: Source: US2005047822A A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, the image forming apparatus including a cam member movable between a first position and a second position away from the first position, the process includes an electrophotographic photosensitive drum; a developing roller, contacted to the electrophotographic photosensitive drum, for developing an electrostatic latent image formed on the drum; a first frame for supporting the drum; a second frame for supporting the developing roller, the second frame being connected with the first frame for relative rotation about a shaft which is disposed downstream of the developing roller with respect to a mounting direction in which the process cartridge is mounted to a main assembly of the apparatus; an entering portion, provided at one end portion of the second frame with respect to a longitudinal direction of the drum and disposed downstream of the shaft with respect to the mounting direction, for permitting at least a part of the cam member with respect to the longitudinal direction to enter when the process cartridge is mounted to the main assembly of the apparatus; and a cam engaging portion for engagement by the cam member to receive from the cam member a force for spacing the drum and the developing roller from each other, the cam engaging portion being disposed at the one longitudinal end portion of the second frame and downstream of the entering portion with respect to the mounting direction.

Probable Assignee: CANON INC

Earliest Publication Date: 20050302



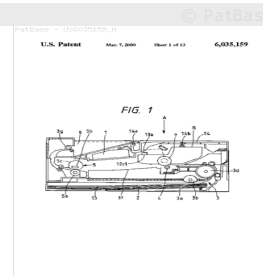
16) Family number: 12261314 (US6035159A)

PROCESS CARTRIDGE WITH AXIALLY SHIFTABLE DRIVE COUPLING

Abstract: Source: US6035159A An electrophotographic image forming apparatus which forms an image on a recording medium and to which a process cartridge can detachably be mounted includes (a) a cartridge mounting portion capable of detachably mounting a process cartridge including an electrophotographic photosensitive drum, a process device acting on the photosensitive drum, and a projection having a first-twisted-polygonal prism shape provided on one longitudinal end of the photosensitive drum, (b) a rotatable rotary member having a first twisted hole of polygonal cross-section, (c) a rotatable coupling shaft supported for axial movement and being provided at its one end with a second-twisted-polygonal prism shape fitted into the first twisted hole of the rotary member, and being provided at its other end with a second twisted hole of polygonal cross-section for engaging with and disengaging from the projection having the first-twisted-polygonal prism shape and having substantially the same twisted angle and twisted direction as those of the first-twisted-polygonal prism shape, (d) a spring member for biasing the coupling shaft toward the photosensitive drum, (e) an axial direction shifter for shifting the second twisted hole and the projection having the first-twisted-polygonal prism shape relative to each other between a first position and a second position, and (f) a conveyor for conveying the recording medium.

Probable Assignee: CANON INC

Earliest Publication Date: 19980401



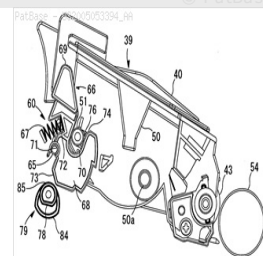
17) Family number: 31732260 (US2005053394A)

DEVELOPING CARTRIDGE, PHOTSENSITIVE MEMBER CARTRIDGE, PROCESS UNIT, AND IMAGE FORMING APPARATUS

Abstract: Source: US2005053394A A lever is provided in a photosensitive member frame of a photosensitive member cartridge that accommodates a developing cartridge in a cartridge accommodating portion. The lever is engaged with an engaging shaft of the developing cartridge, and is movable between a contact position and a separation position. When the lever is in the contact position, a developing roller and a photosensitive drum make contact with each other, and when the lever is in the separation position, the developing roller and the photosensitive drum are separated.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20050207



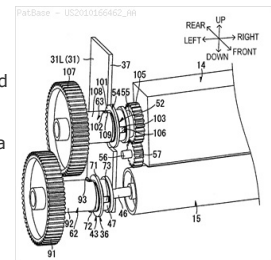
18) Family number: 45844877 (US2010166462A)

IMAGE FORMING APPARATUS

Abstract: Source: US2010166462A An image forming apparatus includes: a plurality of photosensitive members, an endless belt, and a separation mechanism. The photosensitive members are arranged in parallel with and spaced from one another and correspond to respective colors. The plurality of photosensitive members includes a first photosensitive member and at least one second photosensitive member. Each of the photosensitive members has a first end portion and second end portion that is opposite to the first end portion in a longitudinal direction of each of the photosensitive members. The endless belt contacts the photosensitive members. The separation mechanism is configured to swing the second photosensitive member around the first end portion of the second photosensitive member as a fulcrum between a contact position at which the second photosensitive member contacts the endless belt and a separated position at which the second photosensitive member is separated from the endless belt.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20100630



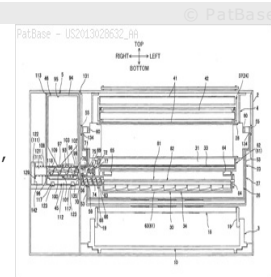
19) Family number: 52871445 (US2013028632A)

IMAGE FORMING APPARATUS AND DEVELOPER CARTRIDGE

Abstract: Source: US2013028632A A support member that supports a plurality of developer cartridges is configured to be moved in a predetermined direction between a mounted position and a pulled-out position. A moving mechanism is configured to move a supply member in the developer cartridge between a communication position and an interrupt position when the support member is in the mounted position. When the supply member is in the communication position, a supply opening and a reception opening are in communication with each other and the support member is incapable of moving in the predetermined direction. When the supply member is in the interrupt position, the supply member is moved away from the corresponding one of a plurality of image forming unit in the axial direction to interrupt communication between the supply opening and the reception opening and the support member is movable toward the pulled-out position in the predetermined direction.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20130130



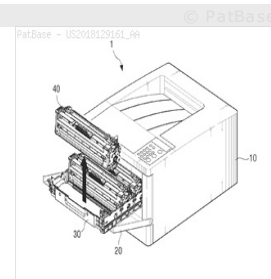
20) Family number: 69659470 (US2018129161A)

IMAGE FORMING APPARATUS

Abstract: Source: US2018129161A An image forming apparatus includes a main body; a tray for a toner cartridge slidably coupled to the main body and configured to be pushed into and pulled out from the main body; a lever hinge-coupled to a portion of the tray for the toner cartridge and configured to rotate through a push-in/pull-out operation of the tray; a link member hinge-coupled to a portion of the lever and configured to move to a push-in/pull-out direction of the tray through rotation of the lever and simultaneously to perform pressure and pressure release on at least one customer replacement unit memory (CRUM) contact unit located in an inside of the main body; and a support frame configured to elastically support the CRUM contact unit to a direction that a photosensitive drum provided in the toner cartridge is spaced from an image transfer unit located in the main body.

Probable Assignee: HP PRINTING KOREA CO LTD

Earliest Publication Date: 20180510



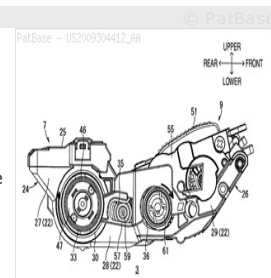
21) Family number: 43459052 (US2009304412A)

IMAGE FORMING APPARATUS

Abstract: Source: US2009304412A An image forming apparatus is provided. The image forming apparatus includes a main body; process cartridges, each including a photosensitive drum and a developing roller; a body frame including a abutment portions and projecting portions; fixing members configured to rotate to a locked state where the fixing members bring the process cartridges into abutment with the abutment portions and to an unlocked state where the fixing members are spaced apart from the process cartridges; spacing members which move to a spacing position where the developing rollers are spaced apart from the photosensitive rollers and a permissive position where the developing rollers are in contact with the developing rollers; and a translation member reciprocating in a straight line for displacing the fixing members between the locked state and the unlocked state and moving the spacing members between the spacing position and the permissive position.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20090701



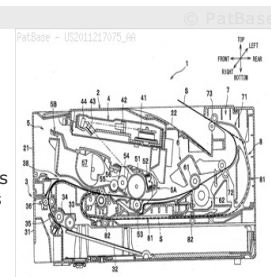
22) Family number: 49551932 (US2011217075A)

IMAGE FORMING APPARATUS

Abstract: Source: US2011217075A A positioning guide is configured to guide a rotational axis of a photosensitive body when a process cartridge is mounted on a main body, and to determine a position of the rotation axis of the photosensitive body with respect to the main body in a mounting state in which the process cartridge has been mounted on the main body. A photosensitive body drive gear is configured to be capable of rotating in a forward and reverse direction and to transmit a rotational drive force to the photosensitive body in the mounting state. A regulating member is configured to be in a lock state and an unlock state. In the lock state, the regulating member prohibits the rotational axis of the photosensitive body from moving in the mounting/removing direction. The rotational axis of the photosensitive body is released from the regulating member in the unlock state.

Probable Assignee: BROTHER IND LTD

Earliest Publication Date: 20110908



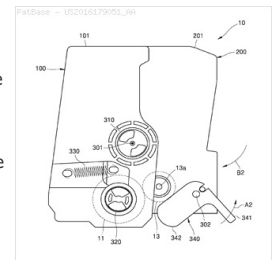
23) Family number: 62729383 (US2016179051A)

DEVELOPING CARTRIDGE AND IMAGE FORMING APPARATUS EMPLOYING THE SAME

Abstract: Source: US2016179051A Provided is a developing cartridge including a photosensitive unit and a developing unit connected to each other to rotate to a developing location and a non-developing location. An elastic member applies an elastic force to the developing unit and the photosensitive unit in a direction of rotating to the developing location. The developing cartridge includes a nip separating portion switched to a nip forming location where the developing unit is located at the developing location and to a nip separating location where the developing unit is located at the non-developing location, a manipulation portion for switching the nip separating portion to the nip forming location and to the nip separating location by a manual manipulation, and a nip forming unit for switching the nip separating portion from the nip separating location to the nip forming location as the photosensitive unit and the developing unit start to operate.

Probable Assignee: HP PRINTING KOREA CO LTD

Earliest Publication Date: 20160623



24) Family number: 66086094 (US2018284686A)

END MEMBER, PHOTORECEPTOR DRUM UNIT, AND PROCESS CARTRIDGE

Abstract: Source: US2018284686A An end member is disposed in an end portion of a columnar rotating body, comprising: a shaft member; and a bearing member which holds the shaft member, wherein the shaft member comprises: a rotating shaft; and a rotating force receiving portion, and wherein at least one of the shaft member and the bearing member has a mechanism where the rotating force receiving portion moves also in a shaft line direction without be inclined by a movement of the rotating force receiving portion in a direction orthogonal to the shaft line direction or by a rotation of the rotating force receiving portion around a shaft line.

Probable Assignee: MITSUBISHI CHEMICAL CORP

Earliest Publication Date: 20170615

