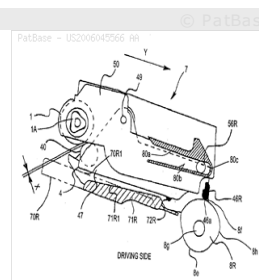
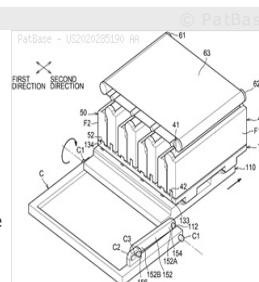


**1) Family number: 32660186** (US2006045566 AA)**PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS**

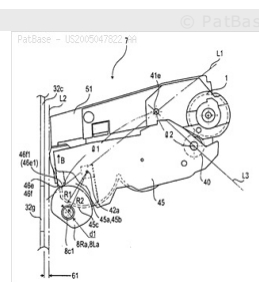
**Abstract:** Source: US2006045566 AA A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, the process cartridge including a cam member movable between a first position and a second position, the cartridge includes a photosensitive drum; a developing roller contactable to the drum at a development position to develop a latent image formed on the drum; a first frame supporting the drum; second frame supporting the developing roller, the second frame being connected with the first frame for rotation about a rotational axis so that developing roller and the drum are contacted to or spaced from each other; a cam engaging portion for receiving from the cam member which is located at the first position a force effective to space the developing roller and the drum from each other in a state in which upward movement of the first frame is limited when the cartridge is mounted to the main assembly, the cam engaging portion being provided on the second frame at a position downstream of the development position at a side across the rotational axis from the development position, a portion to be guided for being engaged and guided by a guide surface provided in the main assembly when the cartridge is mounted to the main assembly, wherein the portion to be guided is guided by the guide surface such that cam engaging portion moves beyond above a tangent line, parallel to the mounting direction, of a cam surface of the cam member to permit the cam engaging portion is brought into contact to the cam surface from an upper position.

**Probable Assignee:** CANON INC**Earliest Publication Date:** 20060302**2) Family number: 77782901** (US2020285190 AA)**IMAGE FORMING APPARATUS**

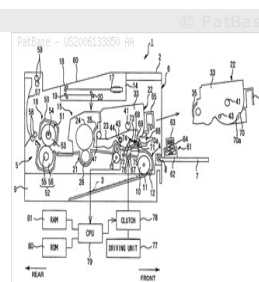
**Abstract:** Source: US2020285190 AA An image forming apparatus including a main body casing, a cover, a drum cartridge, a developing cartridge, an intermediate transfer belt and a movable cam. The movable cam is movable among a first position when the cover is in the open position, a second position and a third position when the cover is in the closed position. In a case where the movable cam is in the first position, the photosensitive drum is in a first drum position spaced from the intermediate transfer belt, and the developing roller is in a first developing position spaced from the photosensitive drum. In a case where the movable cam is in the second position, the photosensitive drum is positioned toward the intermediate transfer belt from the first drum position. In a case where the cam is in the third position, the developing roller is positioned toward the photosensitive drum from the first developing position.

**Probable Assignee:** BROTHER IND LTD**Earliest Publication Date:** 20200214**3) Family number: 31716683** (US2005047822 AA)**PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS**

**Abstract:** Source: US2005047822 AA 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**4) Family number: 33043173** (US2006133850 AA)**IMAGE-FORMING APPARATUS**

**Abstract:** Source: US2006133850 AA An image-forming apparatus that includes a drum cartridge, a developer cartridge, a coupling mechanism for interlocking the drum cartridge and the developer cartridge, a releasing cam for releasing the interlock provided by the coupling mechanism, and a toner accommodating chamber for accommodating toner. When the amount of toner accommodated in the toner accommodating chamber is greater than or equal to a prescribed amount, the drum cartridge and the developer cartridge are interlocked by the coupling mechanism. When the amount of toner drops below the prescribed amount so that the chamber is empty, the releasing cam releases the interlock provided by the coupling mechanism.

**Probable Assignee:** BROTHER IND LTD**Earliest Publication Date:** 20060420

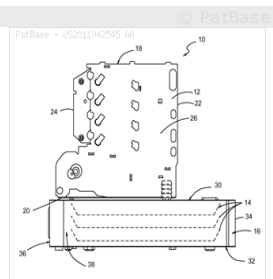
5) Family number: 48342422 (US2011042545 AA)

#### ANTI-TIP STABILITY SYSTEM INTEGRAL TO AN IMAGING APPARATUS

**Abstract:** Source: US2011042545 AA An imaging apparatus having a printer frame, a media tray frame module disposed below the printer frame, and an anti-tip stability system including two alignment posts mounted substantially diagonally on the media tray frame module. The alignment posts have first surfaces and second surfaces where each second surface makes an acute angle ranging from about 10 degrees to about 20 degrees with a horizontal plane. The alignment posts provide anti-tip stability to the imaging apparatus by engaging with the printer frame when the printer frame is tilted at a first contact angle with respect to the alignment posts due to the application of an external force. The alignment posts also facilitate relatively easy separation of the printer frame from the media tray frame module.

**Probable Assignee:** LEXMARK INT INC

**Earliest Publication Date:** 20110224



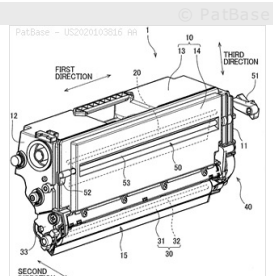
6) Family number: 78180186 (US2020103816 AA)

#### IMAGE-FORMING APPARATUS INCLUDING DRIVING PORTION PROVIDED AT ONLY ONE SIDE OF DEVELOPING CARTRIDGE FOR MOVING DEVELOPING ROLLER TOWARD AND AWAY FROM PHOTSENSITIVE DRUM

**Abstract:** Source: US2020103816 AA An image-forming apparatus includes a developing cartridge, a photosensitive drum, a drawer and a driving portion. The developing cartridge includes: a developing roller rotatable about an axis extending in a first direction; a casing; a first cam positioned at one end of the casing in the first direction; and a pressing surface pivotable in accordance with pivotal movement of the first cam. The drawer includes: a drawer frame to which the developing cartridge is detachably attachable; and a depressed surface with which the pressing surface is contactable. The driving portion is configured to pivotally move the first cam about an axis extending in the first direction. The pressing surface is configured to contact the depressed surface to move the developing roller from a contacting position in contact with the photosensitive drum to a separated position in separation from the photosensitive drum by the pivotal movement of the first cam.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20200402



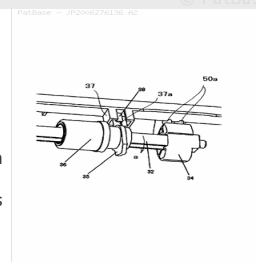
**10) Family number: 33716616** (JP2006276136 A2)

## ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS AND PROCESS CARTRIDGE

**Abstract:** Source: JP2006276136 A2 PROBLEM TO BE SOLVED: To surely identify a process cartridge which has been used. SOLUTION: An electrophotographic image forming apparatus, to/from which a process cartridge having a photoreceptor drum and a developing roller for developing an image formed on the photoreceptor drum can be attached/detached, includes a development separating cam 34 for separating the developing roller from the photoreceptor drum and a life detection means for detecting the life of the process cartridge. When the life detection means detects the life of the process cartridge, a trigger lever 35 arranged coaxially with a development separating cam shaft 32 for driving the development separation cam 34 is driven to non-deform a rib 38 formed on the process cartridge non-reversibly.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20061012



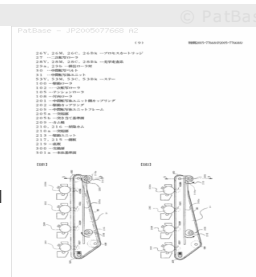
**11) Family number: 31858896** (JP2005077668 A2)

## IMAGE FORMING APPARATUS

**Abstract:** Source: JP2005077668 A2 PROBLEM TO BE SOLVED: To provide a formation apparatus of a full-color image of stable high image quality while realizing excellent usability, in an image forming apparatus to or from which an intermediate transfer body unit holding and conveying a developer image on an image carrier is attached or detached. SOLUTION: The image forming apparatus 1 includes, for instance, an ascending/descending cam 210 by which an intermediate transfer body unit 31 having an intermediate transfer belt 30, which holds and carries a toner image formed on a photoreceptor drum by a processing cartridge 26, is brought into contact with or separated from a photoreceptor drum. The intermediate transfer body unit 31 can be attached to or detached from the image forming apparatus 1. In the image forming apparatus 1, the ascending/descending cam 210 has a projection 210a which energizes the intermediate transfer body unit 31 to the reference face 301a of the main body of the image forming apparatus when the intermediate transfer body unit 31 comes into contact with the photoreceptor drum of the processing cartridge 26.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20050324



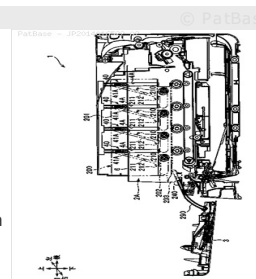
**12) Family number: 55808078** (JP2014016522 A2)

## IMAGE FORMING APPARATUS

**Abstract:** Source: JP2014016522 A2 PROBLEM TO BE SOLVED: To easily detach a cartridge support from an apparatus body. SOLUTION: An image forming apparatus (color printer 1) comprises: a cartridge support that supports a cartridge, and is configured to move between an inner position where the cartridge support is located inside an apparatus body and an external position where at least a part of the cartridge support is located outside the apparatus body; an exposure member (LED unit 40) that exposes a photoreceptor drum, configured to move between a proximity position in the proximity of the photoreceptor drum and a separation position separated from the photoreceptor drum, and has an engaging part at an end in an axial direction of the photoreceptor drum; and an engaged part 210 engaged with the engaging part. The image forming apparatus further comprises a linear motion cam member 200 that is configured to move linearly in a direction of movement of the cartridge support associating with movement of a cover (front cover 3). The linear motion cam member 200, when the cover is at a closing position, causes the exposure member to be located at the proximity position, and when the cover is at an opening position, causes the exposure member to be located at the separation position.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20140130



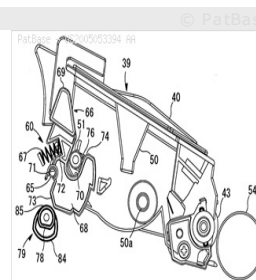
**13) Family number: 31732260** (US2005053394 AA)

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

**Abstract:** Source: US2005053394 AA 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



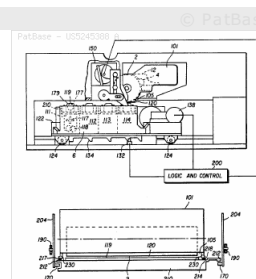
**14) Family number: 11288789** (US5245388 A)

## IMAGE FORMING APPARATUS INCLUDING INDEXIBLE TONING UNITS

**Abstract:** Source: US5245388 A Image forming apparatus includes a photoconductive drum cartridge which has an opening through which toner is applied to an electrostatic image formed on the photoconductive drum. To provide more than one color, a development device includes four toning units which are indexible into alignment with the toning opening in the cartridge. Each toning unit includes an applicator assembly at the top of the unit which is movable with respect to the rest of the unit toward the toning opening. A resilient lift mechanism engages a pair of ledges at opposite ends of the applicator assembly and is actuable to move the applicator assembly toward the toning opening. A sensor senses arrival of each toning unit in a position aligned with the toning opening. A logic and control in response to a signal from the sensor rotates a cam member which is resiliently coupled to the pins for moving the applicator assembly. The applicator assembly includes three positioning protrusions that seat on flat surfaces adjacent ends of the opening in the cartridge.

**Probable Assignee:** EASTMAN KODAK CO

**Earliest Publication Date:** 19930914



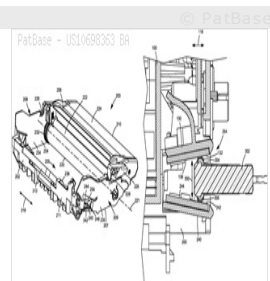
**15) Family number: 79709371** (US10698363 BA)

## ELECTRICAL CONNECTION FOR AN IMAGING UNIT OF AN ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

**Abstract:** Source: US10698363 BA An imaging unit for an electrophotographic image forming device includes a housing having a rotatable photoconductive drum. A frame at a rear of the housing is positioned to matably receive a toner cartridge and is open to a portion of an outer surface of the photoconductive drum. An electrical contact is positioned along a first side wall of the frame for contacting a corresponding electrical contact in the image forming device and is electrically connected to processing circuitry on the housing. The electrical contact of the imaging unit faces upward and is unobstructed from above. A cam surface is positioned along an inner side of the first side wall of the frame for contacting an electrical connector of the toner cartridge and moving the electrical connector of the toner cartridge from a retracted position to an operative position upon mating of the toner cartridge with the imaging unit.

**Probable Assignee:** LEXMARK INT INC

**Earliest Publication Date:** 20200630



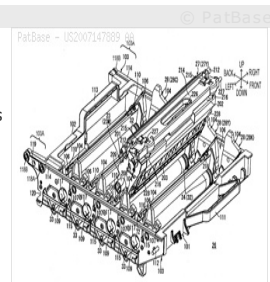
**16) Family number: 34616067** (US2007147889 AA)

## DEVELOPER UNIT AND IMAGE FORMING DEVICE

**Abstract:** Source: US2007147889 AA A developing unit and image formation device in which a developer carrier is reliably pressed towards and separated from an image carrier is described. A separation and pressing mechanism is provided for separating and pressing the developer carriers of developing cartridges installed in a drum unit onto image carriers. This separation and pressing mechanism has a pair of direct cam members. Each direct cam member has a release action portion that engages with the releasing projection of a developing cartridge when the developer carrier is to be separated from the image carrier. Each direct cam member may also have a pressing action portion that engages with the pressing projection of the developing cartridges when the developer carrier is to be pressed onto the image carrier.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20070628



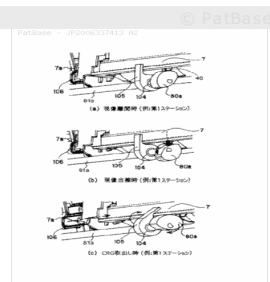
**17) Family number: 34100100** (JP2006337413 A2)

## ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

**Abstract:** Source: JP2006337413 A2 PROBLEM TO BE SOLVED: To improve operability when taking out a cartridge from an image forming apparatus body, with a simple constitution. SOLUTION: The image forming apparatus A is provided with an electrophotographic photoreceptor drum 1, a developing roller 40, and a toner container 41 and a developing frame 45 which can take a contact position bringing the developing roller 40 into contact with the photoreceptor drum 1 and a separating position separating the developing roller 40 from the photoreceptor drum 1. The image forming apparatus A is also provided with a cam 80 pressurizing a rib 46, a rotating shaft 81 supporting the cam 80, and a motor 90 transmitting rotational force to the rotating shaft 81 in a specified direction and in a reverse direction as the specified direction. When the rotational shaft 81 is rotated in the specified direction, the toner container 41 and the developing frame 45 are moved between the contact position and the separating position. When the rotational shaft 81 is rotated in the reverse direction, the cartridge 7 is moved from an image forming position toward an extracting position by allowing the cam 80 to press the cartridge 7.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20061214



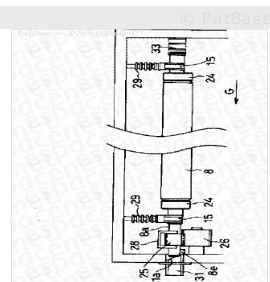
**18) Family number: 15585872** (JP2001166566 A2)

## PROCESSING CARTRIDGE AND IMAGE FORMING DEVICE

**Abstract:** Source: JP2001166566 A2 PROBLEM TO BE SOLVED: To efficiently improve the cleaning effect of a photoreceptor drum and an electrifying roll at low cost. SOLUTION: Relating to the device, the electrifying roll 8 is rotated so that it is counter slid at a nip part with the photoreceptor drum 7. One end of the electrifying roll 8 is supported by a cam 31 that is able to be rotated and another end is energized to a side of the cam 31 by a compressed spring 33. The electrifying roll 8 is moved back and forth on a surface of the photoreceptor drum 7 according to rotation. Residue toner from a transfer on the photoreceptor drum 7 can be dispersed by varying a rotation cycle and a cycle of the back and forth movement of the electrifying roll 8 and electrifying failure can be prevented.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20010622



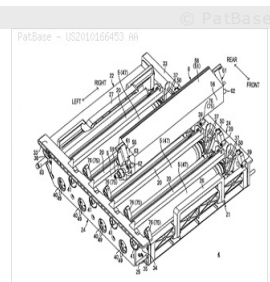
**19) Family number: 45914670** (US2010166453 AA)

## IMAGE FORMING APPARATUS AND DEVELOPING CARTRIDGE

**Abstract:** Source: US2010166453 AA An image forming apparatus includes a drum unit which holds plural photosensitive drums, a developing cartridge which is provided for each photosensitive drum, a translation member which is provided to be movable linearly, and a movable member for each developing cartridge. The movable member includes a main body rotatably supported by the supporting shaft at one end portion thereof, an input portion provided at the other end portion thereof and to which a pressing force is input by the translation member with the linear movement thereof; an abutting portion which is provided between the one and other end portions of the main body, and abuts the drum unit while the movable member rotates about the supporting shaft; and an operating portion which applies to the supporting shaft a force for moving the developing cartridge as the movable member is rotated with the middle portion as a fulcrum.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20100701



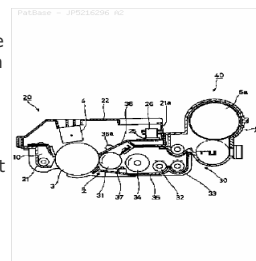
**20) Family number: 10379188** (JP5216296 A2)

## PROCESS CARTRIDGE FOR IMAGE FORMING DEVICE

**Abstract:** Source: JP5216296 A2 PURPOSE:To surely and accurately combine respective cartridges which are divided into a cartridge with built-in photosensitive drum and a cartridge with built-in developer. CONSTITUTION:The process cartridge 40 is constituted of a 1st cartridge with built-in photosensitive drum 20 and a 2nd cartridge 30 with built-in developing device 6 provided with a developing sleeve 31. The 2nd cartridge 30 can be rotated through a supporting shaft 36a with reference to the 1st cartridge 20 and provided with a leaf spring 25 for pressing the 2nd cartridge 30 toward the 1st cartridge 20 and an eccentric cam 26. At the time of combining respective cartridges 20 and 30, the abutting surface of the 2nd cartridge 30 is abutted against the reference surface of the 1st cartridge 20 by the leaf spring 25 for pressing the photosensitive drum 3 in the axial direction of the developing sleeve 31 so that the cartridges may be positioned.

**Probable Assignee:** KONISHIROKU PHOTO IND

**Earliest Publication Date:** 19930827



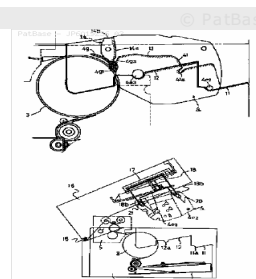
**21) Family number: 10850821** (JP6019236 A2)

#### IMAGE FORMING DEVICE

**Abstract:** Source: JP6019236 A2 PURPOSE:To provide the image forming device where jamming can be treated without requiring a cartridge to be detached and furthermore the image forming device where a drum shutter can be automatically opened and closed. CONSTITUTION:An opening and closing cover 16 that can be opened and closed against a device main body 9 is provided with a mechanism where a processing cartridge 4 can be selectively held. Furthermore, cam parts 13 and 14 are disposed so that the drum shutter 4g can be opened and closed at the time that the processing cartridge 4 is attached or detached.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 19940128



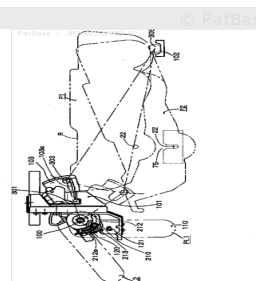
**22) Family number: 23654316** (JP2002221889 A2)

#### ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

**Abstract:** Source: JP2002221889 A2 PROBLEM TO BE SOLVED: To improve the operability of an image forming device to/from which a processing cartridge positioned by being oscillated after being inserted into a device main body in parallel with a photoreceptive drum is loaded and unloaded. SOLUTION: The process cartridge B is loaded and unloaded to/from the device main body by being led by guide rails 101 and 102 at an attachable position P1. The projected shaft 303 of a cartridge is supported by a cam 103 on a rear side to which it is inserted, and next, the guide 301 of the cartridge is disengaged from the guide rail 101. When a rod 213 is pushed in, the cam top part of a plane cam 212 is pushed and a tapered cone 210 is pushed, so that the locking of an arm provided with the cam 103 is released. When a lever 110 is turned from a position PL1 to a position PL2, the cam 103 of an arm end fixed at a shaft 100 descends, so that the cartridge B is set at a printing feasible position P2. Then, since the cam bottom side of a cam face 212a which is the spiral face of the plane cam 212 is rotated to the position of the rod 213, the rod 213 is moved to the cam face 212a by spring force and enters the inside of the lever 110, so that it is not pushed.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20020809



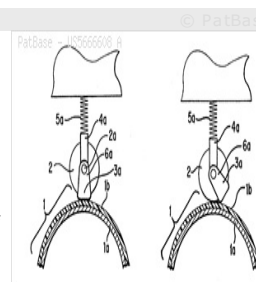
**23) Family number: 13221964** (US5666608 A)

#### CHARGING MEMBER AND IMAGE FORMING MEMBER SPACER APPARATUS

**Abstract:** Source: US5666608 A A spacer apparatus for providing separation between a photoconductor drum and a charge roller in an electrophotographic printing system prior to first use includes a first and a second spacer member pivotally mounted to the shaft of the charge roller. Attached to the first and the second spacer members are, respectively, a first and a second spacer cam which contact the photoconductor drum in a region outside of the electrostatic latent image forming area of the photoconductor drum. Prior to the first rotation of the photoconductor drum, the first and second spacer cams maintain separation between the photoconductor drum and the charge roller. After the first rotation of the photoconductor drum, the first and second spacer cams rotate about the shaft of the charge roller and permit the charge roller to be engaged against the photoconductor drum by the compression springs.

**Probable Assignee:** HEWLETT PACKARD CO

**Earliest Publication Date:** 19970909



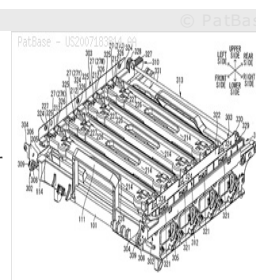
**24) Family number: 34970395** (US2007183814 AA)

#### IMAGE FORMING DEVICE

**Abstract:** Source: US2007183814 AA An image forming apparatus includes a detaching and pressing mechanism for releasing developing rollers of developer cartridges mounted in a drum unit from photosensitive drums and pressing the developing rollers on the photosensitive drums. The detaching and pressing mechanism comprises a pair of translation cam members, intermediate members provided on the translation cam members, cam holders for holding the translation cam members in such a manner as to be linearly movable in an anteroposterior direction, and a synchronous movement mechanism for allowing the pair of translation cam members to linearly move in synchronization.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20070712



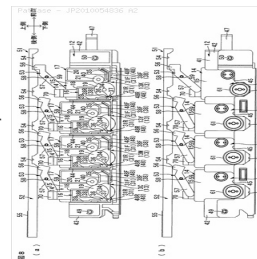
**25) Family number: 44876239** (JP2010054836 A2)

#### IMAGE FORMING APPARATUS AND PROCESS CARTRIDGE

**Abstract:** Source: JP2010054836 A2 PROBLEM TO BE SOLVED: To provide an image forming apparatus which can protect a photoreceptor with compact constitution, and a process cartridge which is attached to the image forming apparatus. SOLUTION: After the process cartridge 13 including the photoreceptor drum 19 is attached to a process frame 12 and after the process frame 12 is attached to a body casing 2, the process cartridge 13 is energized from above toward below or is released from such energizing by a translation cam mechanism 51. Thus, a protection member 31 is made close to or separate from the photoreceptor drum 19 in an up-and-down direction, to expose or protect the photoreceptor drum 19 with the compact constitution.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20100311



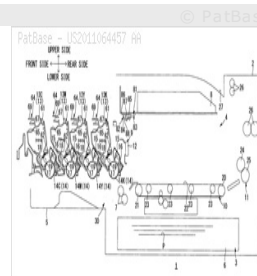
**26) Family number: 48452063** (US2011064457 AA)

#### IMAGE FORMING APPARATUS AND TANDEM TYPE PHOTOSENSITIVE UNIT

**Abstract:** Source: US2011064457 AA 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



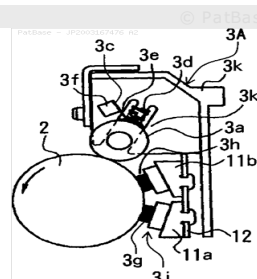
**27) Family number: 28712538** (JP2003167476 A2)

#### TONER PROCESSING DEVICE, PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS

**Abstract:** Source: JP2003167476 A2 PROBLEM TO BE SOLVED: To prevent faulty electrification and an image defect by excellently removing residual toner left on the surface of a photoreceptor drum after transferring a toner image in a cleaner-less type image forming apparatus. SOLUTION: A brush unit 3j is disposed on the downstream side of a transfer roller and on the upstream side of an electrifying roller 3a in the rotating direction of the photoreceptor drum 2. The unit 3j is constituted by attaching a residual toner uniformizing means 3g and a toner electrification amount control means 3h to a supporting member 12, and is reciprocated in the generating line direction of the drum 2. In such a case, the rotation from the outside of the unit 3 is converted into reciprocation through a motive power converting mechanism consisting of a coupling gear, a cam gear and the cam groove of a cam disposed in an electrification unit 3. The residual toner left on the surface of the drum 2 after transfer is uniformly leveled over the surface of the drum 2 by the uniformizing means 3g, and the uniformized residual toner is electrified to obtain a specified polarity by the control means 3h.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20030613



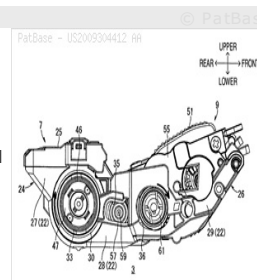
**28) Family number: 43459052** (US2009304412 AA)

#### IMAGE FORMING APPARATUS

**Abstract:** Source: US2009304412 AA 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 an 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



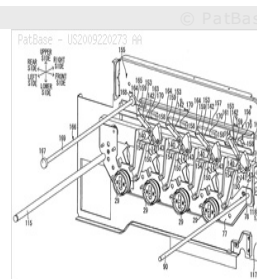
**29) Family number: 43683598** (US2009220273 AA)

#### IMAGE FORMING APPARATUS

**Abstract:** Source: US2009220273 AA An image forming apparatus is provided. The image forming apparatus includes: a main body; a tandem type photosensitive unit, integrally retaining a plurality of photosensitive drums in a parallelly arranged state, mounted in the main body to be movable along the direction of the arrangement of the photosensitive drums; a developer cartridge provided correspondingly to each photosensitive drum, retaining a developing roller for feeding a developer to the corresponding photosensitive drum and detachably mounted on the tandem type photosensitive unit; a translation member provided in the main body to be linearly movable in the direction of the arrangement; and a link member provided correspondingly to each developer cartridge and displaced to a pressing position where a first end portion thereof is opposed to a prescribed portion of each developer cartridge while a second end portion opposite to the first end portion is pressed by the translation member following linear movement of the translation member so that the first end portion presses the prescribed portion in a direction for separating the developing roller from the photosensitive drum and a releasing position where the translation member is released from pressing the second end portion so that the first end portion is released from pressing the prescribed portion, while each developer cartridge is mounted on the tandem type photosensitive unit.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20090903



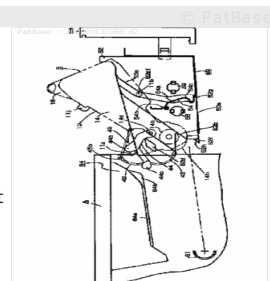
**30) Family number: 13915946** (JP2000132068 A2)

#### PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

**Abstract:** Source: JP2000132068 A2 PROBLEM TO BE SOLVED: To provide a process cartridge capable of smoothly performing open and close of a drum shutter, and an electrophotographic image forming device. SOLUTION: The first shutter 42 is supported by arms 44 and 45, the second shutter 43 pivotally attached to the first shutter 42, and energized by a spring so that the inside comes closely. When the process cartridge B is inserted into a movable body 50, the first cam part 44b is brought into contact with the cam receiving surface 52d on the movable body, the shutter is partially opened, and moreover when the movable body is inserted into the device A, the second cam part 44c is brought into contact with the cam receiving surface 64b, the remainder of the shutter is opened.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20000512



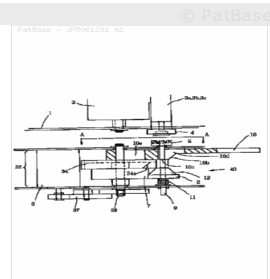
**31) Family number: 9372997** (JP5061281 A2)

#### IMAGE FORMING DEVICE

**Abstract:** Source: JP5061281 A2 PURPOSE: To eliminate the need of specially separating the coupling member to be driven of a process cartridge and a driven coupling member of a device main body and to improve operability and reliability by interlocking the separation the coupling members with the action of the opening/closing cover of a device main body. CONSTITUTION: A photosensitive drum 2 is arranged in a process cartridge 1, and developing sleeves 3a-3c being members to be driven are disposed around the drum 2. The shafts of the developing sleeves 3a-3c are projected to the outside of the process cartridge 1, and a driven coupling members 4 to be driven are respectively provided at the ends of the shafts. The driving coupling members 5 are respectively provided on the device main body corresponding to the coupling members 4 to be driven of the process cartridge 1 so that they can contact and separate from the members 4. When an opening door (not shown by figure) is rotated to be opened, a releasing member 10 goes to the right. Thus, the cam part 10b of the member 10 pushes and restores a shifting member 12 which advances by resisting a spring 11 so as to separate the member 5 meshing with the member 4.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 19930312



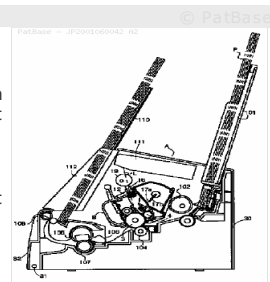
**32) Family number: 14136979** (JP2001060042 A2)

#### PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

**Abstract:** Source: JP2001060042 A2 PROBLEM TO BE SOLVED: To provide an inexpensive process cartridge and an image forming device by which the pressure of a developing roller to a photoreceptive drum is kept always constant regardless of toner quantity inside a developing unit, and the image excellent in quality is stably obtained. SOLUTION: A spring 12 is pressed by the cam 19 of a device main body through a spring presser 15. The residual quantity of toner at the inside of a developing unit is detected by antennas 17a and 17b at any time, and the pressure of the spring 12 is controlled by changing the rotation angle of the cam 19 based on a data thereof, so that the pressure of the developing roller 4 to the photoreceptor drum 3 is kept constant.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20010306



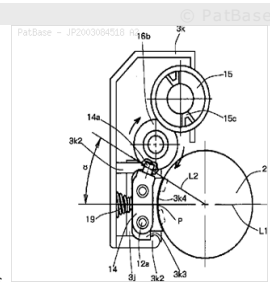
**33) Family number: 28459221** (JP2003084518 A2)

#### MECHANISM FOR MOVING PROCESS MEANS, ELECTRIFICATION DEVICE PROCESS CARTRIDGE AND ELECTRONIC PHOTOGRAPH IMAGE FORMING APPARATUS

**Abstract:** Source: JP2003084518 A2 PROBLEM TO BE SOLVED: To prevent a motion converting part from energizing a process means to a photoreceptor drum and from enlarging the driving load of the photoreceptor drum when the process means is made about on the photoreceptor drum and the process means reciprocates in a longitudinal direction in the process cartridge of a cleanerless system. SOLUTION: A cam follower 14a reciprocates in parallel to the photoreceptor drum 2 by a cylindrical cam part 16b and reciprocates a brush unit 3j. The guide cover 12a of the brush unit 3j is fixed to a transmission arm 14. A spacer 3k3 supporting the guide cover 12a freely movably can advance/retract to/from the photoreceptor drum 2 by a support part 3k2. The brush unit 3j pressurizes the photoreceptor drum 2 by a spring 19. If a is within 90 degrees when the cam part 16b turns clockwise, the force of the driving conversion part of the cylindrical cam part 16b and the cam follower 14a operates to a direction where the brush unit 3j is separated from the photoreceptor drum 2. When a is 90 degrees, force parallel to the tangent direction of the photoreceptor drum 2 in a point P operates on the brush unit 3j. Thus, the load of the driving source of the photoreceptor drum is prevented from being enlarged.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20030319



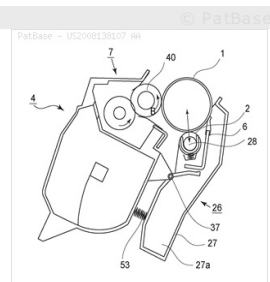
**34) Family number: 41910539** (US2008138107 AA)

#### PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS

**Abstract:** Source: US2008138107 AA An image forming apparatus includes a cartridge including an electrophotographic photosensitive member, a developing roller, a spacer movable between spacing and contacting positions for spacing apart and contacting the roller and member, and a receiver receiving a force spacing the roller from the member. The apparatus includes a mounter detachably mounting the cartridge, an abuter retracting the spacer from the spaced position when the mounter mounts the cartridge with the spacer at the spaced position, and a function member movable between a first position spacing the roller from the member by abutting the receiver with the cartridge mounted to the mounter and a second position contacting the roller to the member. When the mounter mounts the cartridge with the spacer at the spaced position, the abuter abuts the spacer retracting it from the spaced position after insertion so that the function member taking the first position abuts the receiver.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20080612



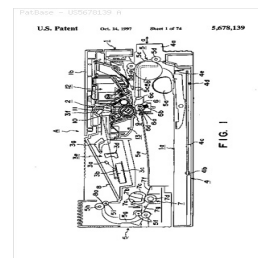
**35) Family number: 9115907** (US5678139 A)

## PROCESS CARTRIDGE WITH SHUTTER FOR PROTECTING PHOTSENSITIVE DRUM

**Abstract:** Source: US5678139 A 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



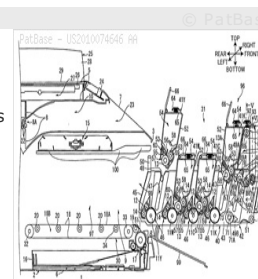
**36) Family number: 44664219** (US2010074646 AA)

## IMAGE-FORMING APPARATUS AND DEVELOPING UNIT

**Abstract:** Source: US2010074646 AA A plurality of photosensitive bodies is juxtaposed in a conveying direction, in which a recording medium is conveyed, with confronting the conveying unit. Each of a plurality of developing units is configured to move between a first position where the developing unit is capable of supplying developer to the corresponding photosensitive drum and a second position where the developing unit separates from the corresponding photosensitive drum. A cleaning member is configured to move between a third position where the cleaning member is capable of collecting a waste developer deposited on the conveying unit and a fourth position where the cleaning member separates from the conveying unit. A receptacle is slidably supported on one of the developing units and accommodates the collected waste developer. The cleaning member moves integrally with the receptacle. The receptacle and the one of the developing units are integrally detachably mounted on the main casing.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20100325



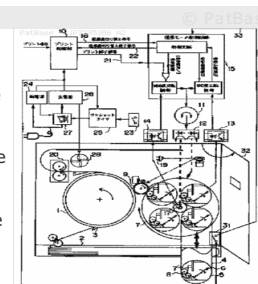
**37) Family number: 12984665** (JP7295386 A2)

## IMAGE FORMING DEVICE

**Abstract:** Source: JP7295386 A2 PURPOSE:To provide an image forming device capable of miniaturizing the device and preventing the damage of a photoreceptor drum by separating a developing sleeve therefrom in the state where it is preferable that the developing sleeve is not abutted on the photoreceptor drum. CONSTITUTION:Plural developing cartridges 4 are housed in a developing unit switching-over unit 7. At the time of recording an image, the developing sleeve 8 in the developing cartridge 4 is made to abut on the photoreceptor drum 9 by a pressurizing cam 17 to supply toner. When the formation of the image is completed, a printing control part 10 outputs a printing completion signal 21 to a developing motor control circuit 15 and when it receives the printing completion signal, the control circuit 15 reversely turns a motor 11 by 180 deg., so that pressurizing cam 17 is rotated to release the abutting state of the photoreceptor drum 9 on the developing sleeve 8 and they are separated from each other.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 19951110



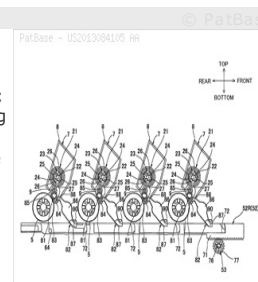
**38) Family number: 53424790** (US2013084105 AA)

## IMAGE FORMING APPARATUS CAPABLE OF SWITCHING OPERATION MODE

**Abstract:** Source: US2013084105 AA An image forming apparatus includes: first and second photosensitive drums; first and second developing rollers each defining an axis in an axial direction; first and second driving-force inputting sections; first and second couplings; and a connecting mechanism. A driving force inputted to each coupling is transmitted to each developing roller via each driving-force inputting section when each coupling is connected to the corresponding driving-force inputting section. The connecting mechanism is movable between a first position and a second position to cause the first and second couplings to move in the axial direction such that the first and second couplings are connected or disconnected relative to the first and second driving-force inputting sections.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20130404



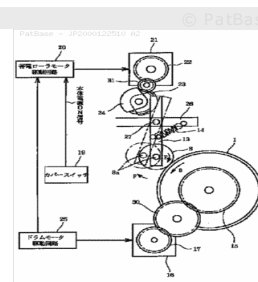
**39) Family number: 13891311** (JP2000122510 A2)

## ELECTRIFICATION DEVICE, IMAGE FORMING DEVICE AND PROCESS CARTRIDGE

**Abstract:** Source: JP2000122510 A2 PROBLEM TO BE SOLVED: To prevent toner from being attached to an electrification member and to prevent electrifying performance from being lowered even when the large quantity of toner is fed by providing a device with a separation means for an electrification member temporarily separating the electrification member from an image carrier when a power source is turned on. SOLUTION: In response to the ON signal of a main body power source from a cover switch 19, a driving circuit for an electrification roller motor 20 is actuated so that an electrification roller motor 21 is rotated. Besides, a gear 23 is rotated. Thus, since a cam 24 is rotated so as to push up the separation means for an electrification member 13, an electrification roller 8 is separated from a photosensitive drum 1. Next, a drum motor 16 is driven to be rotated by a driving circuit for a drum motor 25 so as to rotate the drum 1. Since the roller 8 is separated from the drum 1, the toner of a toner image is not attached to the roller 8. Thus, even in the case that a power source is turned off because of trouble while an image is formed and the large quantity of toner is fed when the power source is turned on again, the image is stably formed by temporarily separating the roller 8 from the drum 1 and preventing the electrifying performance from being lowered due to attaching of the toner.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20000428



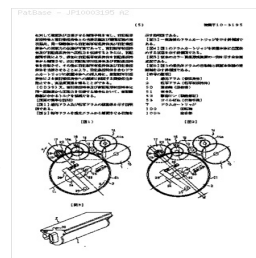
**40) Family number: 15067517** (JP10003195 A2)

## COLOR IMAGE FORMING DEVICE

**Abstract:** Source: JP10003195 A2 PROBLEM TO BE SOLVED: To prevent deterioration of image caused by the rubbing between a photoreceptor drum and a transfer drum, at the time of installing a drum cartridge in a device main body. SOLUTION: A separating means for separating the transfer drum 2 from the photoreceptor drum 1 is constituted of an eccentric cam 25, a fitting hole 24, a pressing plate 26 and a spring 28. For the contact/separation states of the transfer drum 2 with/from the photoreceptor drum 1, driving by a single motor 12 can be attained and when rotational force is transmitted to the transfer drum 2 and the photoreceptor drum 1, first the transfer drum 2 is separated from the photoreceptor drum 1 by the separating means, then, both of them are rotated and after that, the transfer drum 2 is brought into contact with the photoreceptor drum 1. Thus, both of them are rotated without rubbing, to prevent the surface of the photoreceptor drum from being flawed.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 19980106



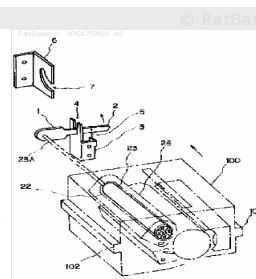
**41) Family number: 11327246 (JP6175468 A2)**

#### IMAGE FORMING DEVICE

**Abstract:** Source: JP6175468 A2 PURPOSE: To move a magnetic pole of a built-in magnet backward from a charging position when a charger is not used in an image forming device using a magnetic brush type charger. CONSTITUTION: In the case where a process cartridge 100 is inserted to a device main body for installation, a lever 1 made into one body with a magnet 23 is fitted in a cam groove 7 of a regulating member 6 of the device main body side to turn the magnet 23, and a magnetic pole of the magnet 23 is positioned opposite to the peripheral surface of a photoreceptor drum 10 to start the charging operation. On the other hand, in the case where the process cartridge 100 is drawn the device main body for ejection, the lever 1 is detached from the engagement with the cam groove 7 and turned by the energization of a tensile spring 5 to move the magnetic pole of the magnet 23 backward from the position opposite to the photoreceptor 10.

**Probable Assignee:** KONISHIROKU PHOTO IND

**Earliest Publication Date:** 19940624



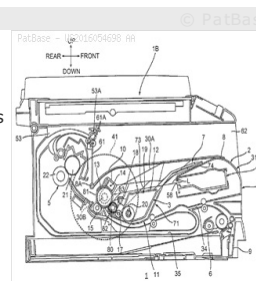
**42) Family number: 61742255 (US2016054698 AA)**

#### IMAGE FORMING APPARATUS

**Abstract:** Source: US2016054698 AA There is provided an image forming apparatus including a main body and a cartridge having an image carrier and a first coupling configured to rotate the image carrier. The main body includes a second coupling, a rotator and a receiving member. The second coupling is configured to rotate together with the first coupling about a rotation axis coaxially with the first coupling. The rotator includes gear teeth. The rotator is configured to rotate the second coupling in response to receiving the drive force from the drive source, and to rotate together with the second coupling about the rotation axis coaxially with the second coupling. The rotator, which is configured to rotate about the rotation axis coaxially with the first coupling configured to rotate the image carrier, overlaps with the receiving member when viewed from an axial direction parallel to the rotation axis.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20160225



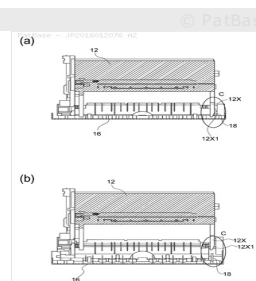
**43) Family number: 61608276 (JP2016012076 A2)**

#### IMAGE FORMING APPARATUS

**Abstract:** Source: JP2016012076 A2 PROBLEM TO BE SOLVED: To provide an image forming apparatus having a cartridge removably attached thereto in a direction perpendicular to the axial direction of a drive coupling of an apparatus body, and can improve performance of alignment of the drive coupling of the apparatus body and a driven coupling of the cartridge. SOLUTION: An image forming apparatus 100 includes an apparatus body 100A that has an openable/closable door 16; a drive coupling 51 that is arranged in the apparatus body 100A; a cartridge 12 that includes a photoreceptor drum 12a having a driven coupling 52 coupled to the drive coupling 51 and removably attached to the apparatus body 100A; and a development pressure cam 41 and an inclination mechanism 30X that move the cartridge 12 in the axial direction J of the drive coupling 51 with a pressure link 63, a pressure auxiliary gear 62, and a pressure gear 61, which are displaced when the door 16 is closed.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20160121



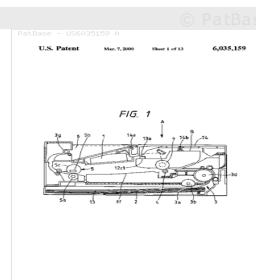
**44) Family number: 12261314 (US6035159 A)**

#### PROCESS CARTRIDGE WITH AXIALLY SHIFTABLE DRIVE COUPLING

**Abstract:** Source: US6035159 A 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



**45) Family number: 34472729 (US2007147883 AA)**

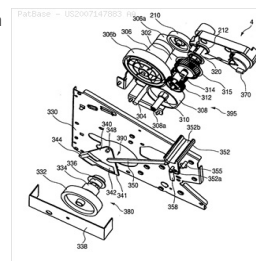
#### IMAGE FORMING APPARATUS, PROCESS UNIT, AND DEVELOPING CARTRIDGE

PatBase - US2007147883 AA

**Abstract:** Source: US2007147883 AA An image forming apparatus that includes: a process unit; a driving source; a first driving unit that rotates when a rotation driving force generated by the driving source is transmitted; and a connection switching unit that switches between a transmission state in which the rotation driving force is transmitted to the first driving unit and a non-transmission state. The process unit includes: a transmission permission unit that switches a state of the connection switching unit into the transmission state, when the process unit exists at a process mounting location with respect to the image forming apparatus; and a second driving unit that joints with the first driving unit when the process unit exists at the process mounting location and rotates a rotation driving subject in the process unit by a rotation force of the first driving unit.

**Probable Assignee:** BROTHER IND LTD

**Earliest Publication Date:** 20070405



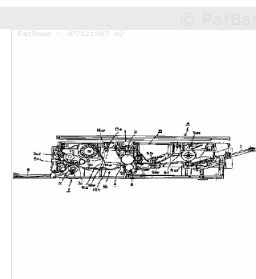
**46) Family number: 12304979 (JP7121087 A2)**

#### PROCESS CARTRIDGE AND IMAGE FORMING DEVICE

**Abstract:** Source: JP7121087 A2 PURPOSE:To miniaturize a device by specifying the retreat position of the shutter mechanism of a process cartridge. CONSTITUTION:When the process cartridge B is loaded in a device main body, an abutting member 15a provided at a cartridge loading part 15 is engaged with a cam 16a1 and a shutter arm 16a is rotated clockwise with a shaft part 13a as the center by resisting to the pressing force of a torsion coil spring. Besides, a shutter part 16b is moved to the retreat position while it is rotated counterclockwise with a shaft part 16b1 as the center by the pressing force (restoring force) of the torsion coil spring. The rotation of the shutter part 16b at this time is regulated by a rotation regulation part provided on the other end of the arm 16a. Then, the rotation regulation part is set so that the shutter part 16b is positioned lower than the exposed part of a photoreceptor drum 9 and it functions as the carrying guide of a recording medium 4 between an image transfer part and a fixing part when the cartridge B is perfectly loaded.

**Probable Assignee:** CANON INC

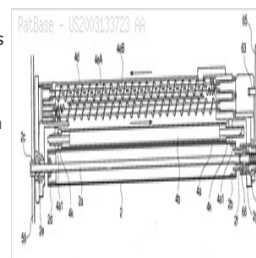
**Earliest Publication Date:** 19950512



**Abstract:** Source: US2003133723 AA A drive transmission mechanism is for transmitting drive to processing means that is in contact with an image bearing member to work on the image bearing member. The mechanism includes a supporting member that supports the processing means. The supporting member is pivotally movable. The mechanism further includes a driving force receiving portion provided on the supporting member for receiving a driving force for reciprocating the processing means in a longitudinal direction of the image bearing member, from a driving force imparting member and regulating member that regulates a pivotal movement of the supporting member.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20030703



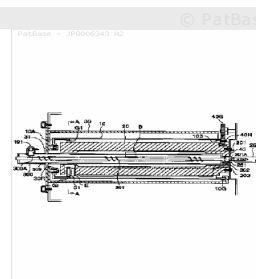
**51) Family number: 13128716 (JP8006343 A2)**

## COLOR IMAGE FORMING DEVICE

**Abstract:** Source: JP8006343 A2 PURPOSE: To store a waste toner storage container having a large capacity by utilizing a dead space in a device main body. CONSTITUTION: A cylindrical waste toner storage container 300 incorporating a conveying screw 301 is inserted floatably in the radial direction at the center section of a support member 20 supporting multiple exposing optical systems and fixed on a device main body side. The waste toner recovered by cleaning is dropped into a receiving port 300A protruded at the front of a cartridge 30, and it is uniformly stored in the container 300 by the thrust of the conveying screw 301 and the vibration caused by the vertical movement of an eccentric cam E due to the rotation of a photoreceptor drum 10.

**Probable Assignee:** KONISHIROKU PHOTO IND

**Earliest Publication Date:** 19960112



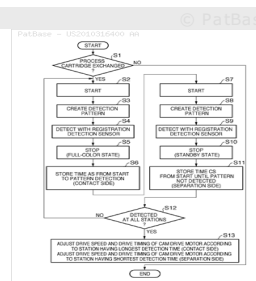
**52) Family number: 47830998 (US2010316400 AA)**

## IMAGE FORMING APPARATUS

**Abstract:** Source: US2010316400 AA In an electrophotographic image forming apparatus employing a contact development system, contact of a development roller 64 against a photosensitive drum 61 is started while forming an electrostatic latent image of a detection pattern 81 for detection in each individual apparatus, and a developed toner image is detected at a predetermined position. At this time, a time as from the time when contact of the development roller 64 was started until the time when the toner image was detected is measured, and a delay time Xs from a time (t11) when contact operation of the development roller 64 was started until a time (t131) of actual contact is calculated by subtracting the time needed until the developed toner image reaches the detection position. The time when contact of the development roller 64 is started is delayed by this time. The same sort of control is also performed for the separation time.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20101215



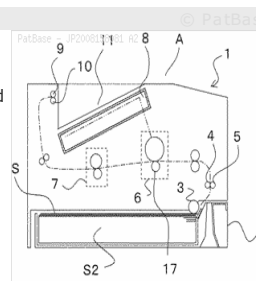
**53) Family number: 42091243 (JP2008158081 A2)**

## DRIVING INPUT, DRIVING RESET, AND SPEED REDUCING MEANS

**Abstract:** Source: JP2008158081 A2 PROBLEM TO BE SOLVED: To solve the problem that a cleaning blade is turned up to break when a user forcibly rotates, forward in a process direction, an electrophotographic photoreceptor drum in a process cartridge of an image forming apparatus with which the user can intentionally rotate the electrophotographic photoreceptor drum while the detachable process cartridge is taken out of an electrophotographic image forming apparatus main body. SOLUTION: The speed reducing mechanism has an input-side gear which can swing, but is stopped from rotating and an output-side gear which is disposed axially opposite the input-side gear and coupled to an electrophotographic photoreceptor drum main body and is characterized in that the input-side gear and output-side gear has a predetermined difference in number of teeth and a meshing portion between the input-side gear and output-side gear moves peripherally through the swinging operation of the input-side gear. An input plate for the speed reducing mechanism is coupled/decoupled to and from the speed reducing mechanism by a cam mechanism which is movable in a thrust direction and moves the input plate in the thrust direction cooperatively with an opening/closing cover.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20080710



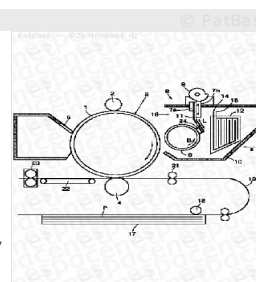
**54) Family number: 15510811 (JP2001066884 A2)**

## DEVELOPING DEVICE, PROCESS CARTRIDGE, AND ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

**Abstract:** Source: JP2001066884 A2 PROBLEM TO BE SOLVED: To obtain a high-quality image by changing the abutting pressure of a developer regulating member on a developer carrier in accordance with the developer amount and environmental change detected by a detection means. SOLUTION: When a main switch is turned on, a photoreceptor drum 1 is driven and simultaneously a cam 9 is driven to move an inflection point adjusting member 7b downward so as to push down the member 7b until the abutting pressure of the developer regulating member 16 becomes specified pressure. Thus, the pressure is applied to the member 16, so that toner on the developer carrier 6 is forcibly triboelectricified and a chance to impart triboelectricity is increased. In the case of detecting that humidity is less than or equal to 20 percent at the time of initial use, strongish pressure is applied to the member 16, so that the triboelectricity of the toner is increased. Therefore, developing rate is improved and image density becomes excellent. Thereafter, the pressure is decreased, whereby the fixed triboelectricity is always imparted to the toner by following up the rise of the toner, and the image density becomes excellent and constant.

**Probable Assignee:** CANON INC

**Earliest Publication Date:** 20010316



**55) Family number: 1376341 (US4012138 A)**

## ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

**Abstract:** Source: US4012138 A An electrostatic photographic copying apparatus wherein the image-forming device, the optical device, the transfer device and the transfer paper transferring device are controlled according to the rotation of the rotary drum so that one cycle of the copying operation is completed while the rotating drum, equipped with a photosensitive element on which to form an image, is rotated through two turns. Substantially the entire surface of the rotary drum can be utilized as an image-forming area by rotating the rotary drum through two turns in one cycle of the copying operation.

**Probable Assignee:** MITA INDUSTRIAL CO LTD

**Earliest Publication Date:** 19740604

