



- (51) International Patent Classification:
G03G 15/08 (2006.01)
- (21) International Application Number:
PCT/JP2012/059826
- (22) International Filing Date:
4 April 2012 (04.04.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
2011-084508 6 April 2011 (06.04.2011) JP
2011-093147 19 April 2011 (19.04.2011) JP
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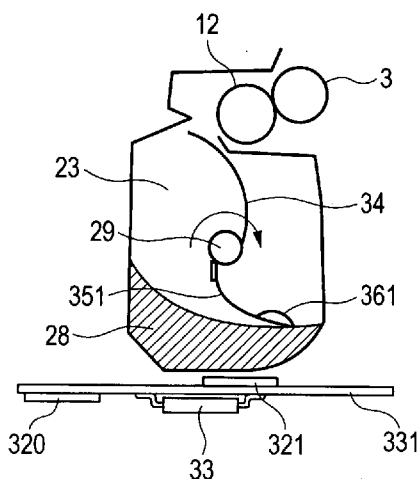
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE,

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(54) Title: IMAGE FORMING APPARATUS

FIG. 2



(57) Abstract: The image forming apparatus includes a developing unit that is detachable and contains a developer, a detection member that includes an electrode to be detected and is rotatable around a rotation axis in the developing unit, an agitator that moves around the rotation axis in the developing unit; an electrostatic capacitance sensor electrode provided on an exterior of the developing unit, an electrostatic capacitance sensor that detects electrostatic capacitance between the electrode to be detected and the electrostatic capacitance sensor electrode, and outputs data on the detected electrostatic capacitance, and a CPU that determines an amount of developer in the developing unit based on the data output from the electrostatic capacitance sensor.



SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT,
TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS,

Published:

- with international search report (*Art. 21(3)*)
- with amended claims (*Art. 19(1)*)

Date of publication of the amended claims: 31 January 2013

AMENDED CLAIMS

received by the International Bureau on 26 October 2012 (26.10.12).

- [1] (Amended) An image forming apparatus comprising:
a developing unit detachably attached to the image forming apparatus, said developing unit containing a developer;
a first member that includes a first electrode and is rotatable around a rotation axis in the developing unit;
a second member that moves around the rotation axis in the developing unit;
wherein during the second member rotates, the first member temporarily stops,
a second electrode provided on an exterior of the developing unit;
an output section that detects an electrostatic capacitance between the first electrode and the second electrode, and outputs data on the detected electrostatic capacitance; and
a determining section that determines an amount of developer in the developing unit based on the data output from the output section.
- [2] An image forming apparatus according to claim 1, wherein the first member follows moving around of the second member until the first member freely falls by its own weight.
- [3] An image forming apparatus according to claim 1 or 2, wherein the second member has a function of agitating the developer in the developing unit.
- [4] An image forming apparatus according to any one of claims 1 to 3, wherein the first electrode is provided near a tip of the first member in a circumferential direction.
- [5] An image forming apparatus according to any one of claims 1 to 4, wherein the output section includes a setting section that sets an amplification factor of the data, and an amplification unit that amplifies the

- data according to the amplification factor set by the setting section.
- [6] An image forming apparatus according to claim 5, wherein the output section changes the amplification factor of the data according to a remaining amount of the developer.
- [7] An image forming apparatus according to claim 5, wherein the output section changes the amplification factor of the data in a condition where rotation of the first member stops.
- [8] An image forming apparatus comprising:
a developing unit detachably attached to the image forming apparatus, said developing unit containing a developer;
a first member that includes a first electrode and moves around a rotation axis in the developing unit;
a second member that includes a second electrode and is provided on the rotation axis of the first member with a predetermined angle with respect to the first member;
a third electrode provided on an exterior of the developing unit;
an output section that detects electrostatic capacitance between the first electrode and the third electrode or between the second electrode and the third electrode, and outputs data on the detected electrostatic capacitance; and
a determining section that determines an amount of developer in the developing unit based on the data output from the output section,
wherein the determining section determines an amount of developer based on a time difference between a time when the output section detects electrostatic capacitance between the first electrode and the third electrode, and a time when the output section detects electrostatic capacitance between the second electrode and the third electrode.

- [9] An image forming apparatus comprising:
a developing unit detachably attached to the image forming apparatus, said developing unit containing a developer;
a first member that includes a first electrode and moves around a rotation axis in the developing unit;
a second member that includes a second electrode and is provided on the rotation axis of the first member with a predetermined angle with respect to the first member;
a third electrode provided on an exterior of the developing unit;
an output section that detects electrostatic capacitance between the first electrode and the third electrode or between the second electrode and the third electrode, and outputs data on the detected electrostatic capacitance; and
a determining section that determines an amount of developer in the developing unit based on the data output from the output section,
wherein the determining section determines an amount of developer based on a time difference between data on electrostatic capacitance between the first electrode and the third electrode output from the output section, and data on electrostatic capacitance between the second electrode and the third electrode output from the output section.
- [10] An image forming apparatus according to claim 8 or 9, wherein the first member and the second member have flexibility, and
the second member has a larger amount of deflection than the first member.
- [11] An image forming apparatus according to claim 10, wherein the first electrode is provided at a tip of the first member in a circumferential direction perpendicular to the rotation axis, and
the second electrode is provided at a tip of the second

member in the circumferential direction.

- [12] An image forming apparatus according to claim 10, wherein the first electrode is provided on a side of the rotation axis of the first member in a circumferential direction perpendicular to the rotation axis, and the second electrode is provided at a tip of the second member in the circumferential direction.
- [13] An image forming apparatus according to claim 8 or 9, wherein the second member has flexibility, the second electrode is provided at a tip of the second member in the circumferential direction perpendicular to the rotation axis, and the first member is the first electrode, has higher rigidity than the second member, and has a function of agitating the developer.