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Ishikawa

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(54) **IMAGE FORMING AND FIXING APPARATUSES HAVING FIXING AND PRESSING ROTATING MEMBER AND RECTIFICATION ELEMENT**

2004/0007569 A1 1/2004 Ohta
2004/0120737 A1* 6/2004 Kataoka et al. 399/328
2004/0161254 A1* 8/2004 Martin et al. 399/67

FOREIGN PATENT DOCUMENTS

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JP H04-134371 A 5/1992
JP H04-274472 A 9/1992
JP H11-190953 A 7/1999
JP 2001100578 A * 4/2001 G03G 15/20
JP 2006072097 A * 3/2006
JP 4040348 B2 11/2007

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OTHER PUBLICATIONS

English machine translation of JP2001-100578 published Apr. 13, 2001.*
Japanese Office Action dated May 31, 2016, in counterpart Japanese Application No. 2012-174366.

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* cited by examiner

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CPC **G03G 15/2053** (2013.01)

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See application file for complete search history.

(57) **ABSTRACT**

By connecting a first diode between a conductive heating element of a fixing roller and ground, electric charge with the same polarity as the charged polarity of toner can be held on the surface of the fixing roller. Meanwhile, by connecting a second diode between the surface of a pressing roller that does not contact an un-fixed toner image and ground, electric charge with the reverse polarity of the charged polarity of the toner can be held at the surface of the pressing roller. The polarity of the electric charge induced by electromagnetic induction is held at the polarity determined by the two diodes, and as a result the fixing offset can be suppressed without adding a collector member or a charging capacitor.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,933,480 B2 8/2005 Ohta
2003/0038125 A1* 2/2003 Kataoka et al. 219/216

13 Claims, 10 Drawing Sheets

