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(54) **Toner, toner cartridge that holds the toner therein, and image forming apparatus into which the toner cartridge is attached**

(57) A toner is used in an image-forming apparatus that incorporates a toner-collecting member. The toner-collecting member (6a) collects residual toner (16a) on a surface of an image-bearing body (1). The toner includes a spherical toner having at least a binder resin, and an irregularly-shaped particles mixed with the spherical toner. The irregularly shaped particle has an average diameter in the range of 1-50 μm . The average

diameter is 14 to 10% of the diameter of a spot printed by the image-forming apparatus. The irregularly shaped particle is a toner having the same color as the spherical toner. The irregularly shaped particle is a colorless toner. The irregularly shaped particle is charged opposite in polarity to the spherical toner. The irregularly has a roundness of 0.85 or less.

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 851 717 A (GOTOH AKIHIKO ET AL) 22 December 1998 (1998-12-22) * claims 1,6 * * figure 3 * * example 1 *	1-4,6,8	G03G9/08 G03G21/00
X	US 5 220 390 A (JUNJI OHTANI ET AL) 15 June 1993 (1993-06-15) * claims 5-7 * * example 1 * * column 2, line 33 - column 3, line 39; figure 1 * * column 4, line 3 - line 8 *	1-4,6-8, 19-21, 23-25	
X	US 5 547 797 A (ANNO MASAHIRO ET AL) 20 August 1996 (1996-08-20) * claims 1,5 * * column 11, line 37 - line 42 *	1-4,6,8	
X	EP 0 933 685 A (CANON KK) 4 August 1999 (1999-08-04) * claims 1,16,17,77 * * paragraph '0196!; figure 3 *	1,5,6, 8-10, 15-19, 22-25	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G03G
X	PATENT ABSTRACTS OF JAPAN vol. 003, no. 143 (E-154), 27 November 1979 (1979-11-27) & JP 54 121130 A (MINOLTA CAMERA CO LTD), 20 September 1979 (1979-09-20) * abstract *	1-4,6,8, 9	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 October 2003	Examiner Schlicke, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EUROPEAN SEARCH REPORT

Application Number
EP 02 25 2780

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	DATABASE WPI Section Ch, Week 198532 Derwent Publications Ltd., London, GB; Class A89, AN 1985-194785 XP002257396 & JP 60 123857 A (KONISHIROKU PHOTO IND CO LTD), 2 July 1985 (1985-07-02) * abstract *	1, 6, 7	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		10 October 2003	Schlicke, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 B2 (P4001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 25 2780

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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10-10-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5851717 A	22-12-1998	JP 8292610 A JP 9050146 A	05-11-1996 18-02-1997
US 5220390 A	15-06-1993	JP 1126670 A	18-05-1989
US 5547797 A	20-08-1996	JP 7049584 A JP 7049585 A	21-02-1995 21-02-1995
EP 0933685 A	04-08-1999	CN 1237723 A EP 0933685 A1 JP 2000075541 A US 6077636 A	08-12-1999 04-08-1999 14-03-2000 20-06-2000
JP 54121130 A	20-09-1979	NONE	
JP 60123857 A	02-07-1985	JP 1657708 C JP 3022979 B	21-04-1992 28-03-1991