



European Patent Office



(11)

EP 0 578 190 A3

(12)

EUROPEAN PATENT APPLICATION

(51) Int. Cl.⁶: **G03G 15/08**, G03G 15/09

(21) Application number: 93110760.1

(22) Date of filing: 06.07.1993

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(30) Priority: 08.07.1992 JP 181167/92

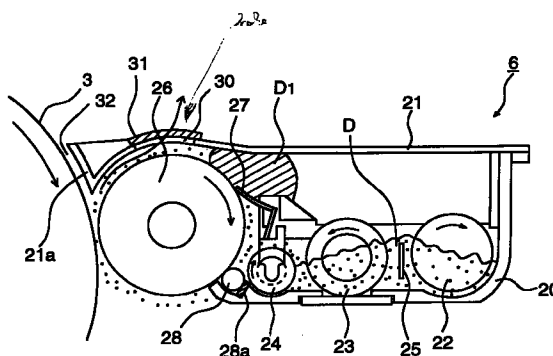
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(54) Developing device for use in image forming apparatus

(57) A developing device (6) of an image forming machine, by which an electrostatic latent image formed on an image carrier (3) is developed with toner. The developing device (6) includes at least one exhaust hole (30) formed in a portion of the housing of the developing device, and an air filter (31), provided in the air exhaust hole (30), to prevent the leakage of developer. In another embodiment the developing device comprises a developing sleeve (26) and at least one groove is provided in the surface of the housing facing the sleeve for preventing developer scattering. Developer scattering prevention members could also be provided to both sides of said housing. A developer layer forming member (28) is attracted by the magnetic force of a magnet in the sleeve to the sleeve (26) and said force is reduced when the gap between member (28) and the sleeve (26) is decreased.

FIG. 1





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EUROPEAN SEARCH REPORT

Application Number
EP 93 11 0760

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.5)
X	US 4 583 112 A (MORANO RICHARD A ET AL) 15 April 1986 * column 4, line 25 - line 57; figures 1,2 *	1,2	G03G15/08 G03G15/09
X	--- PATENT ABSTRACTS OF JAPAN vol. 010, no. 344 (P-518), 20 November 1986 & JP 61 145570 A (SHARP CORP), 3 July 1986, * abstract *	1,2	
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X	--- US 5 057 868 A (SEKINO HITOSHI ET AL) 15 October 1991 * column 5, line 56 - column 6, line 14; figures 3-5 *	6	TECHNICAL FIELDS SEARCHED (Int.Cl.5) G03G
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 June 1997	Examiner Cigoj, P
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03.82 (P04C01)



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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)	
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 33, no. 3B, 1 August 1990, pages 29-30, XP000124246 "TONER SEAL FOR PRINTER" * the whole document *	6,8		
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A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 322 (P-511), 31 October 1986 & JP 61 129664 A (TOSHIBA CORP), 17 June 1986, * abstract *	8,9		
A	PATENT ABSTRACTS OF JAPAN vol. 008, no. 042 (P-256), 23 February 1984 & JP 58 194067 A (FUJI XEROX KK), 11 November 1983, * abstract *	8		TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 220 (P-482), 31 July 1986 & JP 61 055666 A (KONISHIROKU PHOTO IND CO LTD), 20 March 1986, * abstract *	8		
E	PATENT ABSTRACTS OF JAPAN vol. 018, no. 256 (P-1738), 16 May 1994 & JP 06 035304 A (KONICA CORP), 10 February 1994, * abstract *	6,7		
-The present search report has been drawn up for all claims-				
Place of search THE HAGUE		Date of completion of the search 27 June 1997	Examiner Cigoj, P	
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>				

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			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		27 June 1997	Cigoj, P
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respects of which search fees have been paid, namely claims: *1-3, 6-9*
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-3 : Developing device housing having at least one air exhaust hole provided with a filter.
2. Claims 4-5 : Developing device housing having at least one groove provided in its surface facing the developing sleeve.
3. Claims 6-9 : Developing device housing provided at both sides with developer leakage preventing members.
4. Claims 10-11 : Developing device with a developer layer forming member attracted to the developing sleeve by the force of a magnet provided in said sleeve.