



(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
15.03.2006 Bulletin 2006/11

(51) Int Cl.:
B02C 19/06 ^(2006.01) **B02C 23/12** ^(2006.01)
G03G 9/08 ^(2006.01) **B07B 7/086** ^(2006.01)

(43) Date of publication A2:
18.01.2006 Bulletin 2006/03

(21) Application number: **05015126.5**

(22) Date of filing: **12.07.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

(30) Priority: **13.07.2004 JP 2004205500**
20.07.2004 JP 2004211214

(71) Applicant: **Ricoh Company, Ltd.**
Tokyo 143-8555 (JP)

(72) Inventors:
• **Kawamoto, Masahiro**
Ohta-ku
Tokyo 143-8555 (JP)
• **Wakimoto, Kohta**
Ohta-ku
Tokyo 143-8555 (JP)
• **Kubota, Kohji**
Ohta-ku
Tokyo 143-8555 (JP)
• **Kawaguchi, Mamoru**
Ohta-ku
Tokyo 143-8555 (JP)
• **Okegawa, Yoshiyuki**
Ohta-ku
Tokyo 143-8555 (JP)
• **Ueda, Hideyuki**
Ohta-ku
Tokyo 143-8555 (JP)
• **Kakimoto, Masayuki**
Ohta-ku
Tokyo 143-8555 (JP)

- **Sugiyama, Hiroaki**
Ohta-ku
Tokyo 143-8555 (JP)
- **Yamada, Tomoyuki**
Ohta-ku
Tokyo 143-8555 (JP)
- **Kohyama, Yuuichi**
Ohta-ku
Tokyo 143-8555 (JP)
- **Kobayashi, Masato**
Ohta-ku
Tokyo 143-8555 (JP)
- **Nishide, Fumio**
Ohta-ku
Tokyo 143-8555 (JP)
- **Degura, Kenkoh**
Ohta-ku
Tokyo 143-8555 (JP)
- **Yamanaka, Hirofumi**
Ohta-ku
Tokyo 143-8555 (JP)
- **Suganuma, Tohru**
Ohta-ku
Tokyo 143-8555 (JP)
- **Watanabe, Shoji**
Ohta-ku
Tokyo 143-8555 (JP)
- **Tasaki, Ikuo**
Ohta-ku
Tokyo 143-8555 (JP)

(74) Representative: **Barz, Peter**
Patentanwalt
Kaiserplatz 2
80803 München (DE)

(54) **Milling and classifying apparatus, pneumatic impact pulverizer, air classifier and method for producing toner**

(57) Disclosed is a milling and classifying apparatus, adapted to produce toner fine particles, comprising a collision mill, and an air classifier, wherein the collision mill comprises a jet nozzle room, a path, a collision plate, and a collision member mounted to a support of the collision plate at downstream of the collision plate, the air classifier comprises a dispersion room and a classification room,

the classification room is disposed below the dispersion room, and a flow stabilizer is arranged at a central suction of the separator core to control swirl stream generated within the classification room so as to centrifuge the powder into coarse particles and fine particles by action of the swirl stream.

FIG. 4

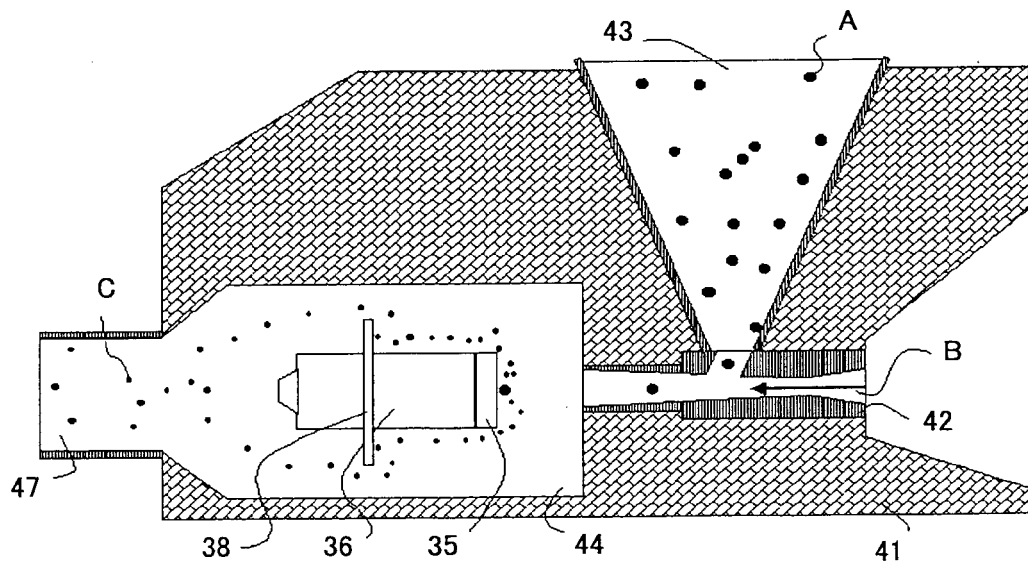
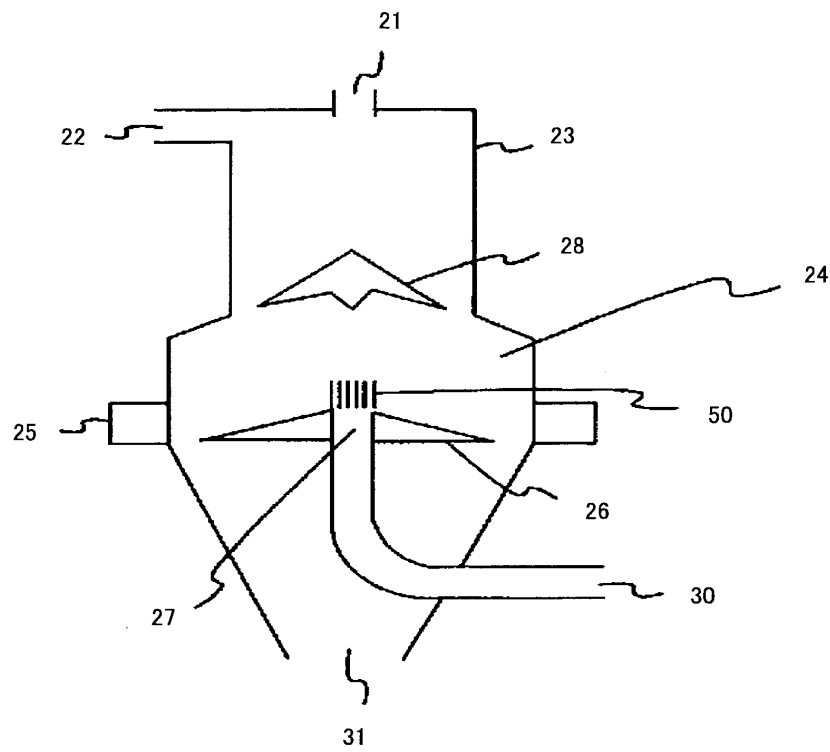


FIG. 9





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 5126

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 679 441 A (CANON KABUSHIKI KAISHA) 2 November 1995 (1995-11-02) * the whole document *	1-26	B02C19/06 B02C23/12 G03G9/08 B07B7/086
A	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) & JP 2004 073918 A (KAO CORP), 11 March 2004 (2004-03-11) * abstract *	1,16-18, 25,26	
X	US 6 103 440 A (LOHR ET AL) 15 August 2000 (2000-08-15) * the whole document *	17	
X	EP 0 718 704 A (MITA INDUSTRIAL CO. LTD) 26 June 1996 (1996-06-26) * the whole document *	17	
X	US 6 335 137 B1 (SUZUKI MASANORI ET AL) 1 January 2002 (2002-01-01) * the whole document *	17	
A	JP 06 154709 A (MITA IND CO LTD) 3 June 1994 (1994-06-03) * the whole document *	26-43	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) B02C G03G B07B
Place of search Munich		Date of completion of the search 11 January 2006	Examiner Kopacz, I
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			

4
EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

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

- ☐ Only part of the claims 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 claim(s):
- ☐ 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 requirements 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.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ 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 respect of which search fees have been paid, namely claims:
- ☐ None 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 invention first mentioned in the claims, namely claims:



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

1. claims: 1-17

A milling and classifying apparatus, a method for producing toner by said apparatus and a toner produced by said apparatus

1.1. claims: 18-26

A collision mill, a method for producing toner by said mill and a toner produced by said mill

2. claims: 27-43

An air classifier, an apparatus comprising this air classifier and a method for producing fine particles by said apparatus

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

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

EP 05 01 5126

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-01-2006

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0679441	A	02-11-1995	EP 0679442 A2	02-11-1995
JP 2004073918	A	11-03-2004	NONE	
US 6103440	A	15-08-2000	BR 9902377 A	14-03-2000
EP 0718704	A	26-06-1996	NONE	
US 6335137	B1	01-01-2002	FR 2795190 A1	22-12-2000
JP 6154709	A	03-06-1994	NONE	