

⑫

EUROPEAN PATENT APPLICATION

⑳ Application number: 85730043.8

⑤① Int. Cl.4: **B 03 C 3/12, B 03 C 3/38,**
B 03 C 3/74

㉔ Date of filing: 21.03.85

③① Priority: 02.04.84 JP 65504/84
03.04.84 JP 66286/84
24.04.84 JP 82646/84

④③ Date of publication of application: 13.11.85
Bulletin 85/46

⑧④ Designated Contracting States: **CH DE FR GB LI SE**

⑧⑧ Date of deferred publication of search
report: 05.03.86 Bulletin 86/10

⑦① Applicant: **MITSUBISHI JUKOGYO KABUSHIKI KAISHA,**
5-1, Marunouchi 2-chome Chiyoda-ku, Tokyo (JP)

⑦② Inventor: **Tomimatsu, Kazutaka** Kobe Shipyard & Engine
Works, **MITSUBISHI JUKOGYO K.K.** 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)
Inventor: **Yagyu, Takashi** Kobe Shipyard & Engine Works,
MITSUBISHI JUKOGYO K.K. 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)

⑦② Inventor: **Yagi, Yoshimi** Kobe Shipyard & Engine Works,
MITSUBISHI JUKOGYO K.K. 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)

Works, **MITSUBISHI JUKOGYO K.K.** 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)

Inventor: **Matsumoto, Yoichi** Takasago Technical
Institute, **MITSUBISHI JUKOGYO K.K.** 1-1,
Shinhamma 2-chome, Arai-cho Takasago City Hyogo Pref.
(JP)

Inventor: **Katayama, Hiroyuki** Takasago Technical
Institute, **MITSUBISHI JUKOGYO K.K.** 1-1,
Shinhamma 2-chome, Arai-cho Takasago City Hyogo Pref.
(JP)

Inventor: **Ohnishi, Shoichi** Kobe Shipyard & Engine
Works, **MITSUBISHI JUKOGYO K.K.** 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)

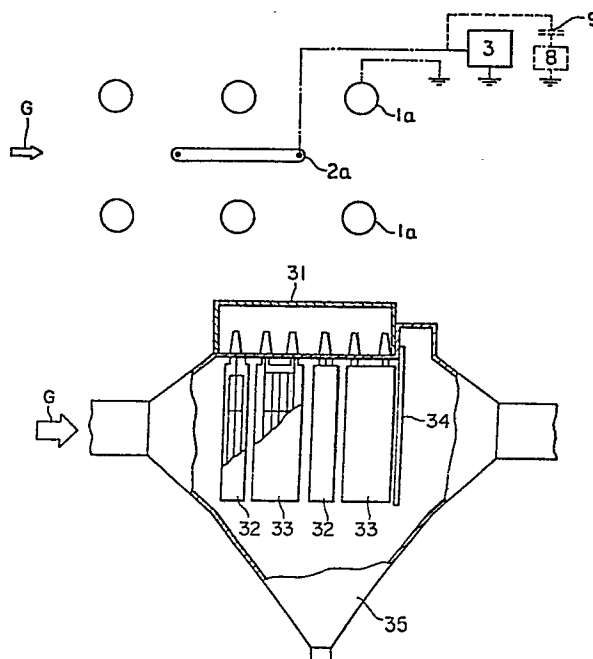
Inventor: **Sugiura, Sakao** Kobe Shipyard & Engine
Works, **MITSUBISHI JUKOGYO K.K.** 1-1,
Wadasaki-cho 1-chome, Hyogo-ku Kobe City Hyogo Pref.
(JP)

Inventor: **Nakayama, Yutaka** Kobe Shipyard & Engine

⑦④ Representative: **Meissner, Peter E., Dipl.-Ing. et al,**
Meissner & Meissner Patentanwälte Herbertstrasse 22,
D-1000 Berlin 33 Grunewald (DE)

⑤④ **Two-stage electrostatic precipitator.**

⑤⑦ A two-stage electrostatic precipitator includes a charging unit for mainly charging dust and a dust collecting unit for mainly collecting dust, wherein the charging unit utilizes a discharging electrode having a uniform cross section and the discharging electrode is applied with a high voltage pulse superimposed on a direct current high voltage, then the electrostatic precipitator is further improved in that a dust collecting electrode of the collecting unit is disposed polygonally and a small section damper for cutting off the flow of gas is provided downstream of the collecting unit, so that the economical efficiency and the dust collecting efficiency of the precipitator are improved.





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.4)
X	FR-A- 2 226 213 (ISHIKAWAJIMA-HARIMA, JUKOGYO K.K.) * Claims 1,5,6; page 3, line 6 - page 4, line 7; figures 1,2 * & US-A- 4 018 577 (Cat. D) ---	1-3, 7-10	B 03 C 3/12 3/38 3/74
A	IEEE TRANSACTIONS ON ELECTRICAL INSULATION, vol. EI-17, no. 2, April 1982, pages 179-186, New York, US, H.I. MILDE: "Pulse Corona Discharge In Electrostatic Precipitators" * Page 181, part 3.3; page 182, figure 5 * ---	3	
A	S. OGLESBY Jr./GRADY B. NICHOLS: "ELECTROSTATIC PRECIPITATION" 1978, New York, US * Page 271, paragraph 2; figure 12.4 * ---	3,4	TECHNICAL FIELDS SEARCHED (Int. Cl.4) B 03 C
D,A	US-A- 4 126 434 (H. KEIICHI) * Claim 1; figure 4 * ---	5	
A	DE-A- 1 028 538 (G. BISCHOFF) * Claim 1; figure 4 * -----	6	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 27-06-1985	Examiner DECANNIERE
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			





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.

X 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 1-11: Charging unit for two-stage electrostatic precipitator.
- 2) Claim 12: Damper for two-stage electrostatic precipitator.

- ☐ 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 respect of which search fees have been paid, namely claims:
- ☒ 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: 1 - 11