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(71) Applicant: **PPG INDUSTRIES OHIO, INC.** [US/US];
3800 West 143rd Street, Cleveland, OH 44111 (US).

(72) Inventor: **DATTILO, Vincent, P.**; 10405 Mataire Lane,
Strongsville, OH 44136 (US).

(74) Agents: **ALTMAN, Deborah, M.** et al.; PPG Industries,
Inc., One PPG Place, Pittsburgh, PA 15272 (US).

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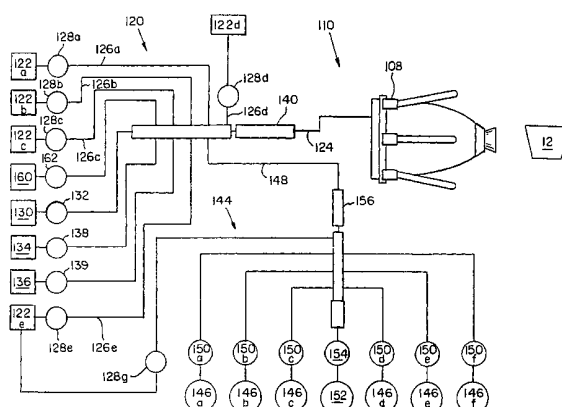
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(54) Title: METHOD AND APPARATUS FOR APPLYING A POLYCHROMATIC COATING ONTO A SUBSTRATE



(57) Abstract: A method is provided for coating a substrate. A first waterborne coating material which is substantially free of effect pigment is applied over the substrate by one or more bell applicators. A second waterborne coating material comprising effect pigment is applied over the first coating material by one or more bell applicators. Between application of the first and second basecoat materials, the first basecoat material can be stabilized by exposing the first basecoat material to air having a temperature ranging from about 50 °F (10.0 °C) to about 90 °F (32.5 °C), a relative humidity of about 40 % to about 80 % and an air velocity at the surface of the coating material of about 20 FPM (0.10 m/s) to about 150 FPM (0.76 m/s) for a period of about 10 to about 180 seconds. A coating application system is also provided. The system includes a first supply of at least one first coating component which is substantially free of effect pigment and a second supply of at least one effect-pigmented coating component. At least one mixer is provided for dynamically mixing the effect pigment-free coating component and/or the effect pigmented coating component to form a mixed coating material. The mixed coating material is received from the mixer and applied over the substrate by a bell applicator.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/30607

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B05D5/06 B05D1/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B05D B05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X Y A	GB 2 319 194 A (KANSAI PAINT CO LTD ;HONDA MOTOR CO LTD (JP)) 20 May 1998 (1998-05-20) page 3, line 28 - line 35 page 4, line 3 - line 4 page 4, line 26 - line 28 page 7, line 7 - line 11 page 8, line 25 - line 28 page 9, line 2 - line 4 page 10, line 15 - line 16 page 10, line 33 - line 35 page 12, line 27 - line 28 page 18, line 23 -page 230, line 2 claims 1,12,14,25 --- -/--	1,4-6, 8-12,20, 21 2,3,7 13-19
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Slembrouck, I

INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 876 111 A (LAMBOUR JEAN-MICHEL ET AL) 24 October 1989 (1989-10-24) claims ---	25-27
X	GB 2 087 264 A (GRACO INC) 26 May 1982 (1982-05-26) claims; figures ---	23
Y	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 08, 30 June 1998 (1998-06-30) & JP 10 080649 A (NISSAN MOTOR CO LTD), 31 March 1998 (1998-03-31) abstract ---	2,3,7
A	US 4 781 949 A (KASARI AKIRA) 1 November 1988 (1988-11-01) claims; example 1 ---	1,13,20
A	US 5 945 218 A (NAKAO YASUSHI ET AL) 31 August 1999 (1999-08-31) claims; examples -----	1,13,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/30607

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2319194	A	20-05-1998	JP 10137677 A	26-05-1998
			CN 1201721 A	16-12-1998
			US 6096378 A	01-08-2000
US 4876111	A	24-10-1989	FR 2606297 A	13-05-1988
			CA 1273852 A	11-09-1990
			DE 263757 T	03-11-1988
			EP 0263757 A	13-04-1988
			JP 1085156 A	30-03-1989
GB 2087264	A	26-05-1982	DE 3145637 A	12-08-1982
			DE 8133609 U	25-08-1983
			FR 2494139 A	21-05-1982
			JP 57119862 A	26-07-1982
JP 10080649	A	31-03-1998	NONE	
US 4781949	A	01-11-1988	JP 1679612 C	13-07-1992
			JP 3042944 B	28-06-1991
			JP 61021761 A	30-01-1986
			DE 3524831 A	16-01-1986
US 5945218	A	31-08-1999	JP 10296170 A	10-11-1998