



①② **EUROPEAN PATENT APPLICATION**

②① Application number : **92301823.8**

②② Date of filing : **03.03.92**

⑤① Int. Cl.⁵ : **C10M 103/00**, C10M 111/02,
C10M 111/04, C10M 177/00,
// (C10M103/00, 103:00,
103:02), (C10M111/02,
103:00, 105:24, 105:72),
(C10M111/04, 103:00,
103:02, 105:22, 105:72,
107:04, 107:28, 107:32,
107:34, 107:38, 107:44),
C10N20:06, C10N40:24

③① Priority : **04.03.91 US 664169**

④③ Date of publication of application :
01.04.93 Bulletin 92/41

⑧④ Designated Contracting States :
**AT BE CH DE DK ES FR GB GR IT LI LU MC NL
PT SE**

⑧⑧ Date of deferred publication of search report :
09.06.93 Bulletin 93/23

⑦① Applicant : **CASTROL INDUSTRIAL INC.**
651 West Washington Boulevard
Chicago, Illinois 60606 (US)

⑦② Inventor : **Lum, Andrew F.**
15927 Avenue San Miguel
La Mirada, California 90638 (US)

Inventor : **Uribe, Juan M.**
1551 Pass & Covina Road
Valinda, California 91744 (US)

Inventor : **Hogan, John M.**
4213 E.9th Street
Long Beach, California 90804 (US)

Inventor : **Persinger, Richard A.**
O N 524 Arbor Court
Winfield, Illinois 6019004 (US)

⑦④ Representative : **Baverstock, Michael George**
Douglas et al
BOULT, WADE & TENNANT 27 Furnival Street
London, EC4A 1PQ (GB)

⑤④ **Carrier-free metalworking lubricant and method of making and using same.**

⑤⑦ In one aspect the invention is a carrier-free pulverulent metalworking lubricant containing a resin having a highly polar functional group, and in another aspect is a method of the invention of forging a workpiece in a die which includes the step of applying to at least one of the die and the workpiece a coating of an effective amount of the carrier-free pulverulent lubricant composition. The use of the composition and method of the invention significantly reduces smoke and oily waste generation in hot forging operations by eliminating the use of oils or volatile organic compounds as carriers, while providing acceptable performance, cleanability, and sprayability.



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 1823

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	GB-A-2 227 022 (HANANO COMMERCIAL) * Page 5, line 2; page 4, line 7 - page 5, line 14; page 6, last paragraph - page 7, line 4 *	1,2,4,5 -8	C 10 M 103/00 C 10 M 111/02 C 10 M 111/04
Y	---	20-24	C 10 M 177/00 //
A	---	11-16	(C 10 M 103/00 C 10 M 103:00 C 10 M 103:02)
Y	EP-A-0 403 306 (CASTROL INDUSTRIAL) * Page 5, lines 13-17; page 3, lines 25-43; claims 12-14 *	20-24	(C 10 M 111/02 C 10 M 103:00 C 10 M 105:24 C 10 M 105:72)
X	---	9,11-17 ,25	(C 10 M 111/04 C 10 M 103:00 C 10 M 103:02 C 10 M 105:22 C 10 M 105:72 C 10 M 107:04
P,X	EP-A-0 468 278 (DAIDO MACHINERY) * Page 2, lines 44-46,54-55; page 3, lines 13-19; page 4, lines 41-48; page 5, lines 4-9 *	1,2,4-6 ,9,11- 16,20, 22-25	-/-
X	PATENT ABSTRACTS OF JAPAN, vol. 6, no. 143 (C-117), 3rd August 1982; & JP-A-57 065 795 (NIPPON STEEL CORP.) 21-04-1982 * Abstract *	1-3,6	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
X	EP-A-0 116 882 (LONZA AG) * Page 3, lines 13-15; page 4, lines 2-5,14-17; page 5, lines 30-32 *	1,2,4-8	C 10 M
A	---	9,11-16	
		-/-	
The present search report has been drawn up for all claims.			
Place of search THE HAGUE		Date of completion of the search 09-10-1992	Examiner HILGENGA K.J.
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 01.82 (P0401)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 1823

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	PATENT ABSTRACTS OF JAPAN, vol. 012, no. 015 (C-469), 16th January 1988; & JP-A-62 169 899 (NIPPON STEEL CHEM. CO.) 27-07-1987 * Abstract * ---	1,2,6,20	C 10 M 107:28 C 10 M 107:32 C 10 M 107:34 C 10 M 107:38 C 10 M 107:44)
A	FR-A-1 183 959 (J.J. CAUBET) * Claims 1,2 * ---	26,27	C 10 N 20:06 C 10 N 40:24
A	EP-A-0 295 074 (VAN STRAATEN CORP.) * Column 3, line 64 - column 4, line 5 * ---	6,7,8,26,27	
A	FR-A-2 339 671 (TRW INC.) * Page 4, line 28 - page 5, line 17; page 13, lines 9-18 * ---	1,2,5,6,9,11,15-17,20,22-25	
A	US-A-4 752 405 (G.H. KYLE) * Column 1, line 61 - column 3, line 10 * ---	1,2,6-8	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
X	FR-A-2 407 034 (BBC SOCIETE ANONYME BROWN) * Claims 1-6 * ---	9,11,15,16,17,25	
X	PATENT ABSTRACTS OF JAPAN, vol. 14, no. 582 (C-0792), 26th December 1990; & JP-A-22 55 537 (RIKAGAKU KENKYUSHO) 16-10-1990 * Abstract * ---	9	
-/-			
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-10-1992	Examiner HILGENGA K.J.
<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 (P0401)



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 1823

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	DE-A-3 837 371 (LUBRIMETAL) * Column 2, line 25 - column 3, line 8 *	18	
A	----- US-A-4 168 241 (T. KOZIMA) -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-10-1992	Examiner HILGENGA K.J.
<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 (P0401)



European Patent
Office

EP 92 30 1823 - B -

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 1-8: Carrier-free pulverulent metalworking lubricant composition, said composition comprising at least one resin having a highly polar functional group.
2. Claims 9-17: Carrier-free pulverulent metalworking lubricant composition, said composition having a substantially uniform particle size.
3. Claims 18,19: Method of forming a carrier-free pulverulent metalworking lubricant composition.
4. Claims 20-24, 26, 27: Method of forging a workpiece by applying lubricant composition of claim 1.
5. Claim 25: Method of forging a workpiece by applying lubricant composition of claim 9.