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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C25F 3/16, 3/22	A1	(11) International Publication Number: WO 97/34030 (43) International Publication Date: 18 September 1997 (18.09.97)
(21) International Application Number: PCT/IT97/00055 (22) International Filing Date: 11 March 1997 (11.03.97) (30) Priority Data: MI96A000494 14 March 1996 (14.03.96) IT (71)(72) Applicant and Inventor: CARRARA, Guiseppe [IT/IT]; Via Cavour, 125, I-20063 Cernusco Sul Naviglio (IT). (74) Agents: ADORNO, Silvano et al.; Società Italiana Brevetti S.p.A., Via Carducci, 8, I-20123 Milano (IT).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: SOLUTION FOR GALVANIC POLISHING OF METAL JEWELRY (57) Abstract An aqueous solution comprising inter alia thiourea, cysteine and other organic compounds containing ionizable hydrogen is used for the galvanic polishing of metal jewelry, thus avoiding the dangerous use of cyanide-containing compounds.		

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SOLUTION FOR GALVANIC POLISHING OF METAL JEWELRY

5 The present invention relates to solutions used to polish jewelry and in particular an aqueous solution for the electrolytic polishing of articles made of precious metals.

 The polishing of metal articles is usually carried out according to various methods, such as mechanical polishing by means of abrasive implements such as grinding wheels, brushes, etc., treatment by means of
10 suitable solvent liquids, electrolytic finishing through the action of electric current on the articles used as electrodes immersed in suitable solutions.

 The polishing usually carried out in goldsmith's workshops is an electrolytic polishing of jewels immersed in a solution containing essentially cyanide ions deriving from compounds such as cyanides and
15 ferrocyanides of alkali metals, by the use of suitable equipment.

 As the utmost toxicity of cyanogen and its derivatives is well known, the competent authorities have enforced strict prohibitions to the use of said cyanic compounds, which made illegal the conventional methods of galvanic or electrolytic polishing with cyanides.

20 The present invention aims therefore at providing a novel solution for polishing jewels, which is free of the above named drawbacks.

 The solution according to the present invention is basically formed by one or more organic compounds containing ionizable hydrogen and comprised in the group formed by thiourea, cysteine, methionine, alanine,
25 glycine and their derivatives, mixed with sulfamic acid and a sulfamate dissolved in water; the polishing process carried out by such a solution is an anodic process wherein the jewel is used as the anode, and the polishing effect is obtained by removing little amounts of metal from the surface of the treated article.

30 A particularly preferred solution comprises thiourea or cysteine, copper sulfamate and sulfamic acid dissolved in water or other aqueous vehicle in variable proportions according to the operating conditions, such as voltage, intensity, kind of electric current (direct, pulsating, etc.), bath temperature, treatment time, and so on.

35 The following examples, simply given for explanatory but not limiting purposes, will better explain the object of the present invention.

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EXAMPLE 1

A red gold jewel connected to the anode of a direct current source so as to have a current density of 1 A/cm^2 is immersed in an aqueous solution containing 80 g/L of cysteine, 100 g/L of sulfamic acid and 100 g/L of copper sulfamate, with pH about 2, and is treated under voltage at a temperature of 80°C up to the attainment of the desired brilliance.

A totally similar effect can be obtained by substituting for cysteine a corresponding amount of thiourea, as it is clear from the following example.

EXAMPLE 2

A red gold jewel connected to the anode of a direct current source is immersed in an aqueous solution containing 50 g/L of thiourea, 60 g/L of sulfamic acid and 5 g/L of copper sulfamate, with pH about 1, and is treated under a variable voltage of 16 V to 28 V according to its weighing into carats at a temperature of 80°C up to the attainment of the desired brilliance.

Although the present invention has been described and explained by means of preferred embodying examples, it is evident that given changes can be made without departing from its gist and leaving its protective scope.

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CLAIMS

1. An improved aqueous solution for the galvanic polishing of metal articles, characterised in that it comprises an effective amount of an organic compound containing ionizable hydrogen selected from the group comprising thiourea, cysteine, methionine, alanine, glycine and their derivatives.
5
2. The solution according to claim 1, characterised in that it further comprises suitable amounts of sulfamic acid and a sulfamate.
- 10 3. The solution according to claim 2, characterised in that said sulfamate is copper sulfamate.
4. The solution according to any previous claim, characterised in that said organic compound is thiourea and/or a derivative thereof.
- 15 5. The solution according to any claim from 1 to 3, characterised in that said organic compound is cysteine and/or a derivative thereof.

INTERNATIONAL SEARCH REPORT

Intern: il Application No
PCT/IT 97/00055

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C25F3/16 C25F3/22

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 6 C25F

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 012, no. 128 (C-489), 20 April 1988 & JP 62 247100 A (KEIJIROU IJIMA;OTHERS: 01), 28 October 1987, see abstract ---	1,2,4
X	US 4 663 005 A (GWYNNE. I. EDSON) 5 May 1987 see column 5 - column 6; claims 1-7 ---	1,4
X	DATABASE WPI Section Ch, Week 7931 Derwent Publications Ltd., London, GB; Class E16, AN 79-56866B XP002032163 & JP 54 077 239 A (KOEI KASEI KK) , 20 June 1979 see abstract --- -/--	1,4

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☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

3 June 1997

Date of mailing of the international search report

13.06.1997

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INTERNATIONAL SEARCH REPORT

International Application No

PC, IT 97/00055

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Section Ch, Week 7949 Derwent Publications Ltd., London, GB; Class M11, AN 79-888388 XP002032164 & SU 652 201 A (JEWEL IND RES INST) , 17 March 1979 see abstract -----	1,4

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT, AT 97/00055

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4663005 A	05-05-87	NONE	