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# (12) United States Patent

#### Vernier

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(54)	USE OF AN AQUEOUS NEUTRAL CLEANING
	SOLUTION AND METHOD FOR REMOVING
	ROUGING FROM STAINLESS STEEL
	SURFACES

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- (\*) Notice: Subject to any disclaimer, the term of this

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C23G 1/00 (2006.01) C23G 1/24 (2006.01)

(56) References Cited

#### U.S. PATENT DOCUMENTS

2,488,832 A	11/1949	Rossi
3,077,487 A	2/1963	Ramsey et al.
3,297,580 A	1/1967	Pitzer
4,082,683 A *	4/1978	Galesloot 510/367
4,610,728 A	9/1986	Natesh et al.
4,789,406 A *	12/1988	Holder et al 134/3
5,037,483 A	8/1991	Dubin
5.587.142 A *	12/1996	Horwitz et al 423/658.5

6,310,024	BI	10/2001	Gill et al.	
6,887,597	BI	5/2005	Yang et al.	
2007/0034606	Al*	2/2007	Dietsche et al.	 216/100

#### FOREIGN PATENT DOCUMENTS

EP	A-0 129 194		12/1984	
EP	A-0 313 335		4/1989	
EP	1043421	A2 *	10/2000	
EP	A-1 043 421		10/2000	
EP	1 300 368	A	4/2003	
EP	A-1 621 521		2/2006	
FR	A-2 590 716		5/1987	
FR	A-2 699 936		7/1994	
GB	A-1 076 979		7/1967	
WO	WO 91/17124	A	11/1991	
WO	WO 00/46423	A	8/2000	
WO	WO 01/42148	A	6/2001	
WO	WO 02/10326	A	2/2002	
WO	WO 2004/011587	AI	2/2004	

#### OTHER PUBLICATIONS

Mathiesen, et al., "Rouging of stainless steel in WFI systems examples and present understanding", FORCE Technology Paper 07193, presented at NACE Corrosion 2007, Mar. 2007 XP002526053.

International Preliminary Report on Patentability PCT/EP2009/ 051074.

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#### (57) ABSTRACT

The invention relates to a method for removing films and deposits from stainless surfaces, especially from stainless metallic surfaces such as they are used in process stations and production units in the pharmaceutical, food and biotechnological industries, and to an aqueous cleaning solution comprising a reducing agent, in particular dithionite and/or disulfite, and at least two different complexing agents, wherein one of these complexing agents is a compound comprising diacetic acid groups or a salt thereof, for removing rouging on surfaces of stainless steels that come into contact with media selected from the group of chromium/nickel and chromium/nickel/molybdenum steels in the neutral pH range.

#### 29 Claims, No Drawings

<sup>\*</sup> cited by examiner

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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

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