



US005904157A

United States Patent [19]
Meseha et al.

[11] **Patent Number:** **5,904,157**
[45] **Date of Patent:** **May 18, 1999**

[54] **COPPER SURFACE PICKLING SYSTEM**

[56] **References Cited**

[75] Inventors: **George M. Meseha**, Salem; **Fausto V. Travares**; **Ramana V. Appadwedula**, both of Norwich; **Emory C. Brown**, Lisbon, all of Conn.

[73] Assignee: **Phelps Dodge Industries, Inc.**, Phoenix, Ariz.

[21] Appl. No.: **08/662,534**

[22] Filed: **Jun. 13, 1996**

Related U.S. Application Data

[60] Provisional application No. 60/014,901, Apr. 5, 1996.

[51] **Int. Cl.⁶** **C23G 5/04**

[52] **U.S. Cl.** **134/3; 134/2; 134/41; 134/42**

[58] **Field of Search** **134/3, 2, 41, 42**

U.S. PATENT DOCUMENTS

2,856,275 10/1958 Otto 41/42
4,754,803 7/1988 Escobar, Jr. et al. 164/452

Primary Examiner—Ponnathapura Achutamurthy

Assistant Examiner—T. D. Wessendorf

Attorney, Agent, or Firm—Fish & Neave; Robert R. Jackson; Keith A. Zullo

[57] **ABSTRACT**

A copper surface pickling process is improved by providing most of the oxidizing agent (such as hydrogen peroxide) used in the process in a separate bath following a primarily acid bath. The temperature of the separate hydrogen peroxide bath can be kept lower, which reduces hydrogen peroxide loss and therefore consumption. After the hydrogen peroxide bath, the copper surface is subjected to high pressure rinsing, including a final stage in which purified (e.g., distilled) water is used.

10 Claims, 2 Drawing Sheets

