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Marsden et al.

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(54) **PROCESS FOR MULTIPLE STAGE DIRECT ELECTROWINNING OF COPPER**

(75) Inventors: **John O Marsden**, Phoenix, AZ (US); **Robert E Brewer**, Park City, UT (US); **Susan R Brewer**, Park City, UT (US); **Joanna M Robertson**, Thatcher, AZ (US); **David R Baughman**, Golden, CO (US); **Philip Thompson**, West Valley City, UT (US); **Wayne W Hazen**, Lakewood, CO (US); **Christel M. A. Bemelmans**, Indian Hills, CO (US)

(73) Assignee: **Freeport-McMoran Corporation**, Phoenix, AZ (US)

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Related U.S. Application Data

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(52) **U.S. Cl.** **204/236**; 204/232; 204/233; 204/234; 205/584; 205/580; 205/586; 75/740; 75/743

(58) **Field of Classification Search** 204/232, 204/233, 234, 236; 205/580, 581, 584, 585, 205/586, 574; 75/740, 743

See application file for complete search history.

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Primary Examiner — Bruce F Bell

(74) *Attorney, Agent, or Firm* — Snell & Wilmer L.L.P.

(57) **ABSTRACT**

A system and process for recovering copper from a copper-containing ore, concentrate, or other copper-bearing material to produce high quality cathode copper from a leach solution without the use of copper solvent/solution extraction techniques or apparatus. A process for recovering copper from a copper-containing ore generally includes the steps of providing a feed stream containing comminuted copper-containing ore, concentrate, or other copper-bearing material, leaching the feed stream to yield a copper-containing solution, conditioning the copper-containing solution through one or more physical or chemical conditioning steps, and electrowinning copper directly from the copper-containing solution in multiple electrowinning stages, without subjecting the copper-containing solution to solvent/solution extraction prior to electrowinning.

11 Claims, 3 Drawing Sheets

