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Marsden et al.

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

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(51) **Int. Cl.**
C25C 1/12 (2006.01)

(52) **U.S. Cl.** **205/580; 205/574; 205/581; 205/584; 205/585; 205/586; 74/740; 74/743**

(58) **Field of Classification Search** **205/574, 205/580, 581, 584, 585, 586; 74/740, 743**

See application file for complete search history.

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(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.

12 Claims, 3 Drawing Sheets

