US 20240403790A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0403790 A1**

Klesov et al. (43) **Pub. Date: Dec. 5, 2024**

(54) **SYSTEM AND METHOD FOR DETERMINING ESTIMATED REMAINING MINERAL IN A STOCKPILE**

(71) Applicant: **FREEPORT MINERALS CORPORATION**, Phoenix, AZ (US)

(72) Inventors: **Oleksandr Klesov**, Lexington, MA (US); **Luke Gerdes**, Framingham, MA (US); **Dana Geislinger**, Chandler, AZ (US); **Margaret Alden Tinsley**, Titusville, FL (US); **Robyn Freeman**, Menlo Park, CA (US); **Akaash Sanyal**, Boston, MA (US); **Muneeb Alam**, Alexandria, VA (US); **Raquel Crossman**, Mesa, AZ (US); **Travis Gaddie**, Phoenix, AZ (US); **Steven Chad Richardson**, Thatcher, AZ (US); **Tianfang Ni**, Boston, MA (US); **Cory A. Demieville**, Scottsdale, AZ (US); **Luciano Kiniti Issoe**, Cerquilho (BR)

(73) Assignee: **FREEPORT MINERALS CORPORATION**, Phoenix, AZ (US)

(21) Appl. No.: **18/807,126**

(22) Filed: **Aug. 16, 2024**

Related U.S. Application Data

(63) Continuation of application No. 17/850,864, filed on Jun. 27, 2022, now Pat. No. 12,106,247.

Publication Classification

(51) **Int. Cl.**

G06Q 10/0637	(2006.01)
C22B 15/00	(2006.01)
G01N 33/24	(2006.01)
G06Q 50/02	(2006.01)

(52) **U.S. Cl.**

CPC ... ***G06Q 10/06375*** (2013.01); ***C22B 15/0065*** (2013.01); ***G01N 33/24*** (2013.01); ***G06Q 50/02*** (2013.01)

(57) **ABSTRACT**

The method may comprise receiving historical data (e.g., mineralogy data, irrigation data, raffinate data, heat data, lift height data, geographic data on ore placement and/or blower data); training a predictive model using the historical data to create a trained predictive model; adding future assumption data to the trained predictive model; running the forecast engine for a plurality of parameters to obtain forecast data for a mining production target; comparing the forecast data for the mining production target to the actual data for the mining production target; determining deviations between the forecast data and the actual data, based on the comparing; and changing each of the plurality of parameters from the forecast data to the actual data to determine a contribution to the deviations for each of the plurality of parameters.