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Fair et al.

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(54) **ELECTRIC RATCHET FOR A POWERED SCREWDRIVER**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,734,207 A 5/1973 Fishbein
4,289,131 A 9/1981 Mueller
4,441,563 A 4/1984 Walton, II

(Continued)

FOREIGN PATENT DOCUMENTS

EP 2221022 A1 8/2010
GB 2171343 A 8/1986

(Continued)

OTHER PUBLICATIONS

Office Action for Korean Patent Application No. 10-2013-7030643 dated Feb. 3, 2015.

(Continued)

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(57) **ABSTRACT**

A powered screwdriver system includes an electric ratchet. In accordance with one aspect, the powered screwdriver system includes a driver housing and includes a motor disposed within the housing. A working end provides a rotational output and is mechanically coupled to the rotor. A power source provides power to the motor. A controller receives signals representative of a motor condition and, based on the received signals, controls the motor in a manner providing the electric ratchet.

25 Claims, 4 Drawing Sheets

