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Boger

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(54) **WIRELESS POWER TRANSFER FOR
PROCESS CONTROL**

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5,190,264 A 3/1993 Boger
5,680,889 A 10/1997 Boger
5,728,942 A 3/1998 Boger
5,771,929 A 6/1998 Boger
5,890,505 A 4/1999 Boger
5,988,586 A 11/1999 Boger
6,272,401 B1 8/2001 Boger et al.
6,453,261 B2 9/2002 Boger et al.
6,745,084 B2 6/2004 Boger et al.

(Continued)

OTHER PUBLICATIONS

Agbinya, Johnson I., *Wireless Power Transfer*, 2nd Ed., 2016, pp.
73-149, River Publishers.

(Continued)

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(2016.02)

(58) **Field of Classification Search**

CPC . H02J 5/005; H02J 7/025; H02J 50/12; H01F
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,319,926 A 5/1967 Boger
3,371,946 A 3/1968 Bleytle, Jr. et al.
3,780,767 A 12/1973 Borg et al.

(57) **ABSTRACT**

A process control apparatus for the control of an industrial
process is disclosed herein. The process control apparatus
may include a power supply that supplies electrical power,
and a single source disposed about an industrial process, the
source in electrical communication with the power supply to
receive electrical power therefrom. The source converts the
electrical power into a wireless power signal. A number of
receivers may be disposed about the industrial process, each
receiver adapted to receive the power signal wirelessly,
convert the power signal into electrical power, and commu-
nicate the electrical power onto a field device. The power
signal may include an oscillating magnetic field M or
electromagnetic waves that may be generally in the ultra-
high frequency (UHF) range. Related methods of process
control of an industrial process are also disclosed herein.

19 Claims, 6 Drawing Sheets

