

(12) **United States Patent**
Burnett et al.

(10) **Patent No.:** **US 6,701,185 B2**
 (45) **Date of Patent:** **Mar. 2, 2004**

(54) **METHOD AND APPARATUS FOR
 ELECTROMAGNETIC STIMULATION OF
 NERVE, MUSCLE, AND BODY TISSUES**

(76) Inventors: **Daniel Burnett**, 12565 Long Lake Ct.,
 Jacksonville, FL (US) 32225; **Shane
 Mangrum**, 3701 Danforth Dr. #908,
 Jacksonville, FL (US) 32224

6,143,035 A 11/2000 McDowell
 6,155,966 A 12/2000 Parker
 6,179,770 B1 1/2001 Mould
 6,190,893 B1 2/2001 Shastri
 6,200,259 B1 3/2001 March
 6,261,221 B1 * 7/2001 Tepper et al. 600/14
 6,349,233 B1 2/2002 Adams

OTHER PUBLICATIONS

(*) Notice: Subject to any disclaimer, the term of this
 patent is extended or adjusted under 35
 U.S.C. 154(b) by 74 days.

(21) Appl. No.: **10/077,434**

(22) Filed: **Feb. 19, 2002**

(65) **Prior Publication Data**

US 2003/0158583 A1 Aug. 21, 2003

(51) **Int. Cl.**⁷ **A61N 1/00**

(52) **U.S. Cl.** **607/2; 607/149; 607/155**

(58) **Field of Search** **600/9, 13-15;
 607/2, 48, 50, 149, 155**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,428,366 A 1/1984 Findl
 4,456,012 A 6/1984 Lattin
 4,548,208 A 10/1985 Niemi
 5,000,178 A 3/1991 Griffith
 5,014,699 A 5/1991 Pollack
 5,181,902 A 1/1993 Erickson
 5,314,401 A 5/1994 Tepper
 5,401,233 A 3/1995 Erickson
 5,518,495 A 5/1996 Kolt
 5,766,124 A 6/1998 Polson
 5,792,187 A 8/1998 Adams
 5,857,957 A 1/1999 Lin
 6,024,691 A 2/2000 Tepper
 6,029,090 A 2/2000 Herbst
 6,032,677 A 3/2000 Blechman
 6,066,084 A 5/2000 Edrich
 6,086,525 A 7/2000 Davey
 6,123,658 A 9/2000 Schweighofer

Trock, David H., et al, The Effect of Pulsed Electromagnetic
 Fields in the Treatment of Osteoarthritis of the Knee and
 Cervical Spine. Report of Randomized, Double Blind, Pla-
 cebo Controlled Trials, The Journal of Rheumatology, 1994,
 p. 1903-1911.

Trock, David H., Electromagnetic Fields and Magnets
 Investigational Treatment for Musculoskeletal Disorders,
 Rheumatic Diseases Clinics of North America, Feb. 2000,
 vol. 26, No. 1.

(List continued on next page.)

Primary Examiner—Mark Bockelman

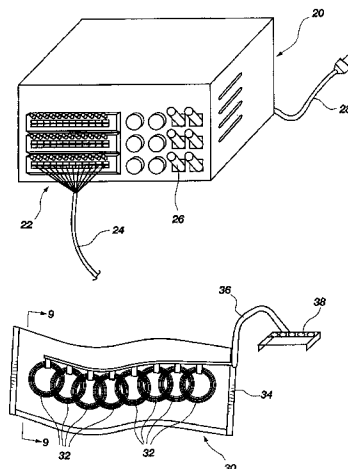
(74) *Attorney, Agent, or Firm*—Maine & Asmus

(57)

ABSTRACT

An electromagnetic stimulation device which is comprised
 of a plurality of overlapping coils which are able to be
 independently energized in a predetermined sequence such
 that each coil will generate its own independent electromag-
 netic field and significantly increase the adjacent field. The
 coils are co-planar and are disposed in an ergonomic body
 wrap, which is properly marked to permit an unskilled
 patient to locate the body wrap, on a particular part of the
 body, of the patient so that the stimulation coils will maxi-
 mize the electromagnetic stimulation on the selected nerves,
 muscles, and/or body tissues near the treated area. The
 device can be used to treat medical conditions including:
 muscular atrophy, neuropathic bladder and bowel, muscu-
 loskeletal pain, arthritis, as well as possible future applica-
 tions in the prevention of deep vein thrombosis and weight
 reduction.

10 Claims, 3 Drawing Sheets



OTHER PUBLICATIONS

Shafik, Ahmed, Magnetic Stimulation: A Novel Method for Inducing Evacuation of the Neuropathic Rectum and Urinary Bladder in a Canine Model, *Urology* 54, 1999, pp. 368–372.

Balmaseda, Marion T. Jr., et al, Burns in Functional Electric Stimulation: Two Case Reports, *Archives of Physical Medicine and Rehabilitation*, Jul. 1987, pp. 452–453, vol. 38.

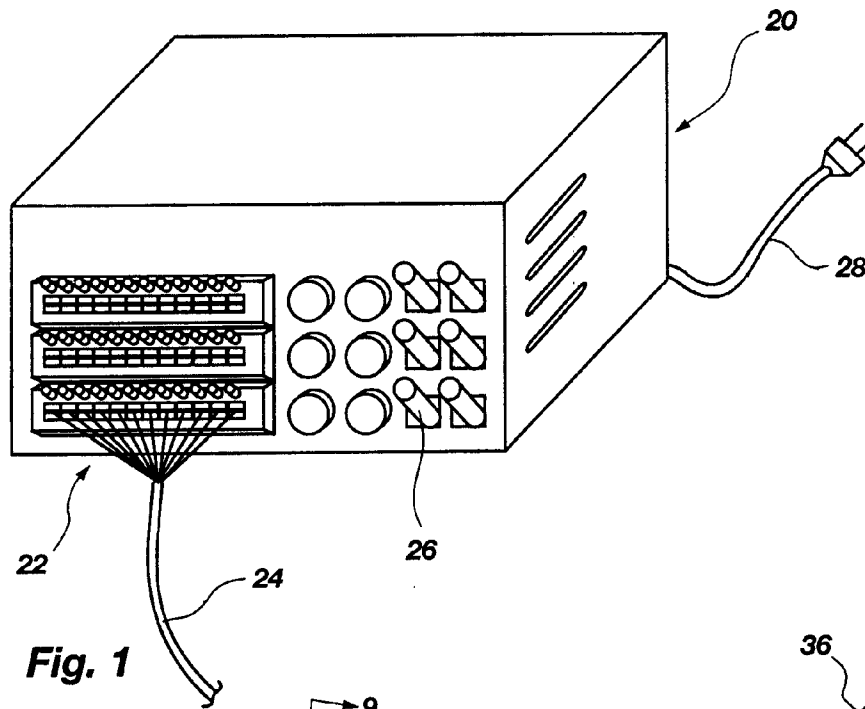
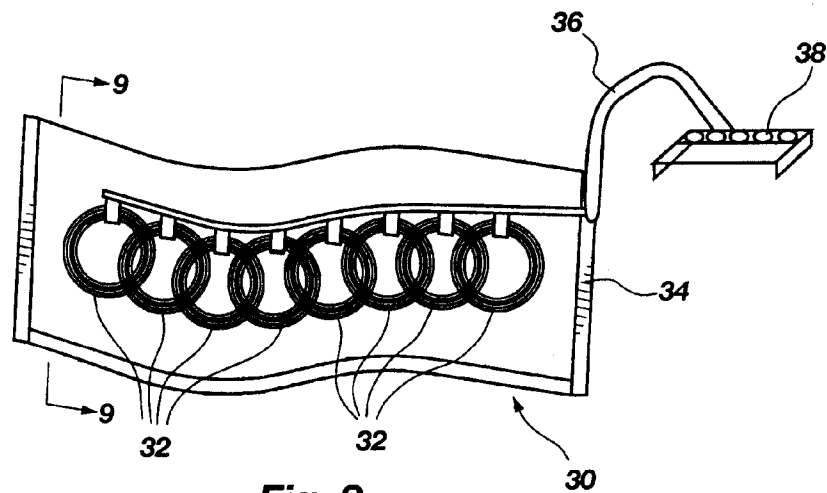
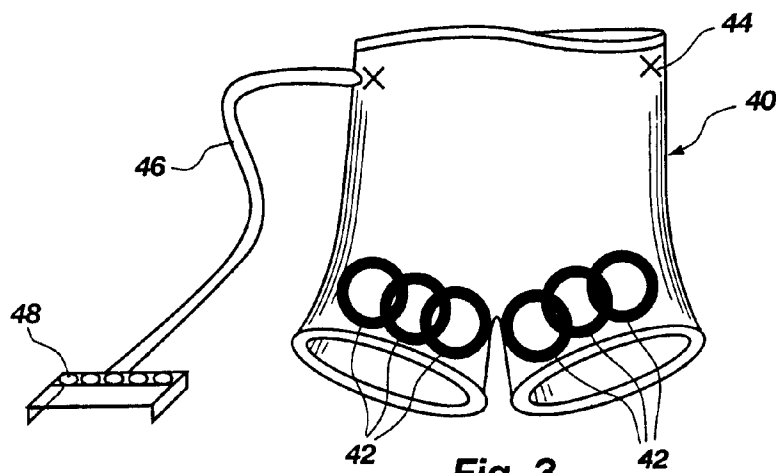
McFarlane, J.P. et al, Acute Suppression of Idiopathic Detrusor Instability with Magnetic Stimulation of the Sacral Nerve Roots, *British Journal of Urology*, 1997, pp. 734–741, vol. 80.

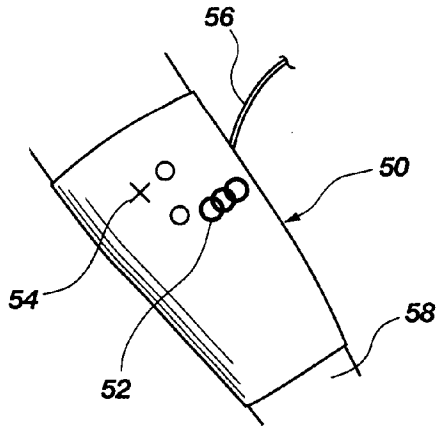
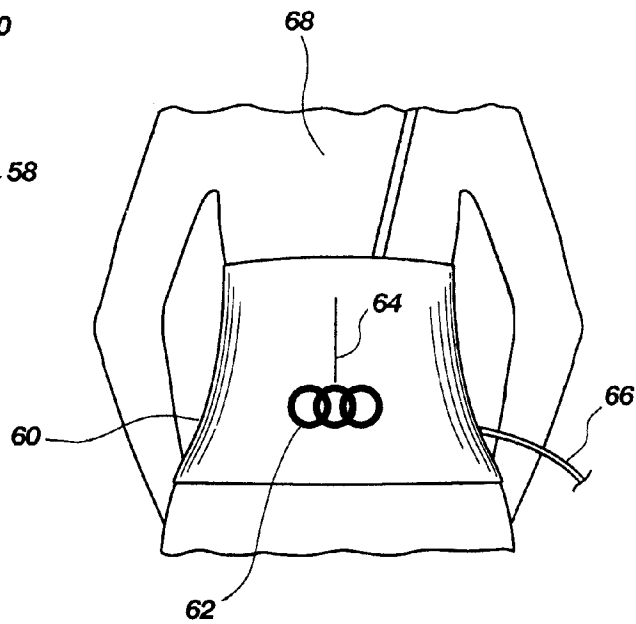
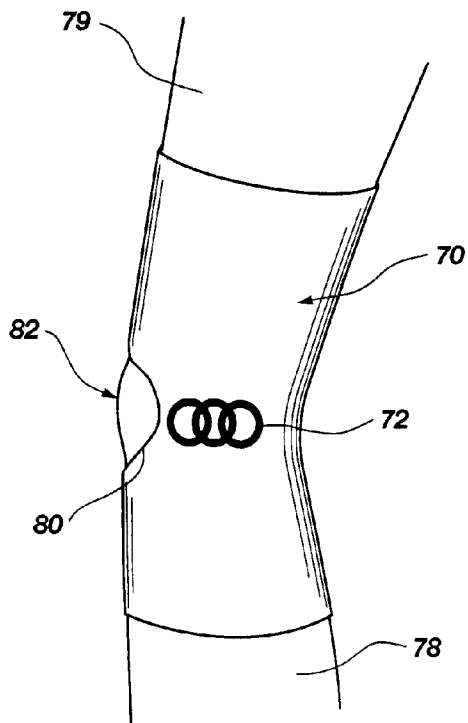
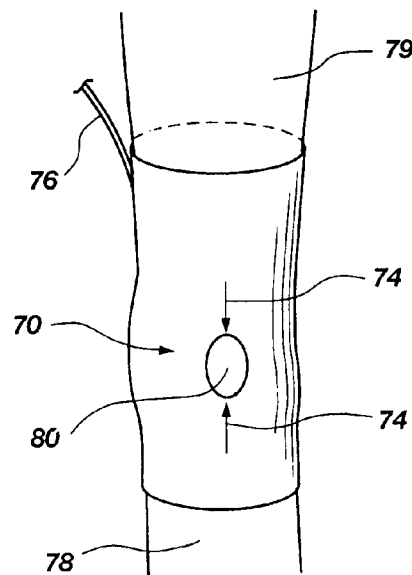
Jacobson, Jerry I. et al, Low–Amplitude, Extremely Low Frequency Magnetic Fields for the Treatment of Osteoarthritic Knees: A Double–Blind Clinical Study, *Alternative Therapies*, Sept./Oct. 2001, pp. 54–64, vol. 7, No. 5.

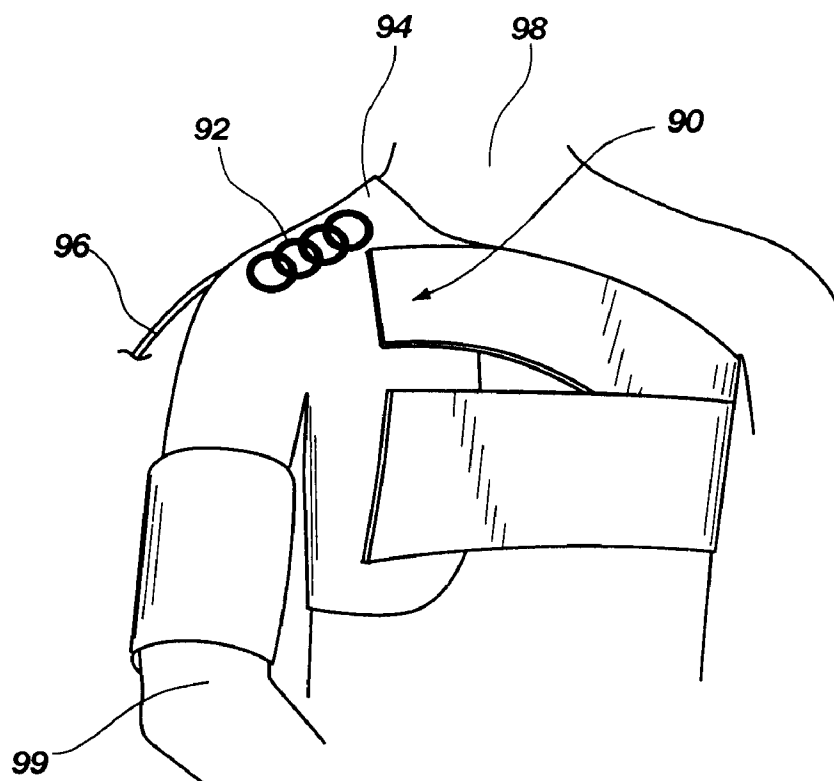
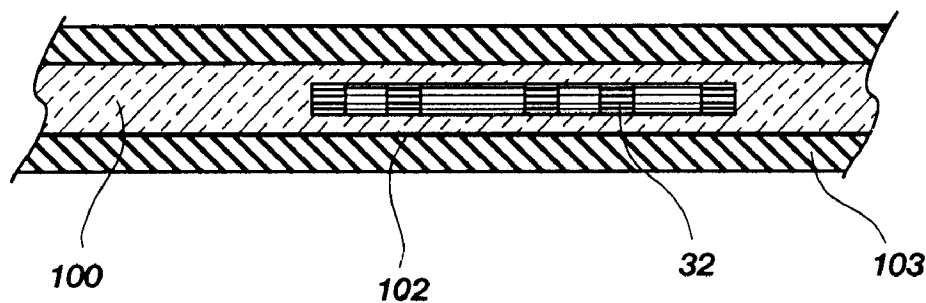
EBI, L.P., EBI BONE HEALING SYSTEM, <http://www.ebimedical.com/products/fracture/bonehealing.html>, 5 pages.

Certified Pulsed Signal Therapy Centers, <http://www.certifiedpst.com>, 10 pages.

* cited by examiner

**Fig. 1****Fig. 2****Fig. 3**

**Fig. 4****Fig. 5****Fig. 6****Fig. 7**

**Fig. 8****Fig. 9**

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.