



New connection on: : 25-11-2020 : 20:34:58 - Last disconnection on: : 25-11-2020 : 20:34:52

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Welcome to EPOQUE Rebuild under the Production Environment

[EPODOC: SS 13] TENS and stimulat+ and nerv+ and (pulse_generat+) and pain+ and current+ and intensity and modulat+

Results in EPODOC 0

[SS 14] TENS AND STIMULAT

Results in EPODOC 0

[SS 15] TENS AND STIMULAT+

Results in EPODOC 318

[SS 16] NERV+ AND PAIN+

Results in EPODOC 8.026

[SS 17] 15 AND 16

Results in EPODOC 72

[SS 18] 17 AND CURRENT+

Results in EPODOC 11

[SS 19] ..LI



PN - [JP2017140448](#) A 20170817
 PNFP - JP6454370B B2 20190116
 PR - US201261657382P
 20120608; US201161560029P
 20111115
 AP - [JP20170079862](#) 20170413
 DT - I
 CT - || STSE (A)
[JP2002517293](#) A 20020618 [X]
 [X] 60-64
 * Paragraphs0016-0028, Figures1-10
 *;
 JPH09117453 A 19970506 [A]
 (KATIMS JEFFERSON JACOB [US])
 [A] -
 * Whole Document *;
[JP2005081068](#) A 20050331 [A]
 (TANITA SEISAKUSHO KK)
 [A] -
 * Whole Document *;
[US2010042180](#) A1 20100218 [A]
 (COMPEX TECHNOLOGIES INC [US],
 et al)
 [A] -
 * Whole Document *
 CCI - [A61N1/0456](#) ; [A61N1/0476](#) ;
[A61N1/0492](#) ; [A61N1/321](#) ;
[A61N1/36021](#) ; [A61N1/36034](#)
 CCA - [A61N1/36031](#)
 CI - A61N1/0456 (EP, CN, US)
 - A61N1/0476 (EP, CN, US)
 - A61N1/0492 (EP, CN, US)
 - A61N1/321 (EP, CN, US)
 - A61N1/36014 (CN, US)
 - A61N1/36021 (EP, CN, US)
 - A61N1/36034 (EP, US)
 - A61N1/37247 (CN, US)
 CA - A61N1/36031 (EP, US)
 FI - A61N1/36
 FT - 4C053/BB23; 4C053/JJ13;
 4C053/JJ18; 4C053/JJ27
 PA - (A)
 NEUROMETRIX INC
 TI - (A)
 APPARATUS FOR
 TRANSCUTANEOUS
 ELECTRICAL NERVE STIMULATION
 AB - (A)

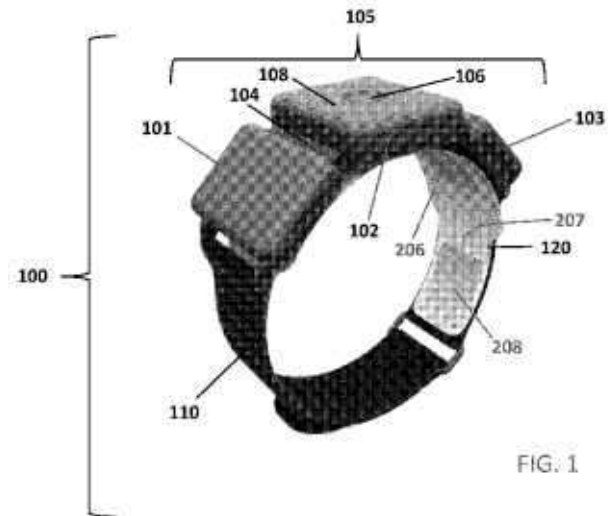


FIG. 1

PROBLEM TO BE SOLVED: To provide improved Transcutaneous Electrical **Nerve Stimulation (TENS)** devices that deliver electrical **currents** across the skin of a patient via electrodes so as to provide symptomatic relief of chronic **pain**.

SOLUTION: Provided is an apparatus, comprising: housings 101, 102, 103; **stimulation** means mounted within the housings; a plurality of electrode arrays 206, 208 releasably mounted to the respective housings, and connectable to the **stimulation** means; control means mounted to the housings, and for controlling the **stimulation** means; monitoring means for monitoring the **stimulation** means; user interface means 106 connected to the control means; display means 108 for displaying the status of the **stimulation** means; and a strap 110 attached to the housing and configured to hold the housings, **stimulation** means, and electrode arrays at specific anatomical sites to treat **pain**.

SELECTED DRAWING: Figure 1

PN - [US2016303364](#) A1 20161020

PR - US201615132066
20160418; US201562149413P
20150417

AP - [US201615132066](#) 20160418

DT - *; Rep

CCI - [A61N1/0452](#); [A61N1/0456](#);
[A61N1/0484](#)

CCA - [A61N1/36021](#)

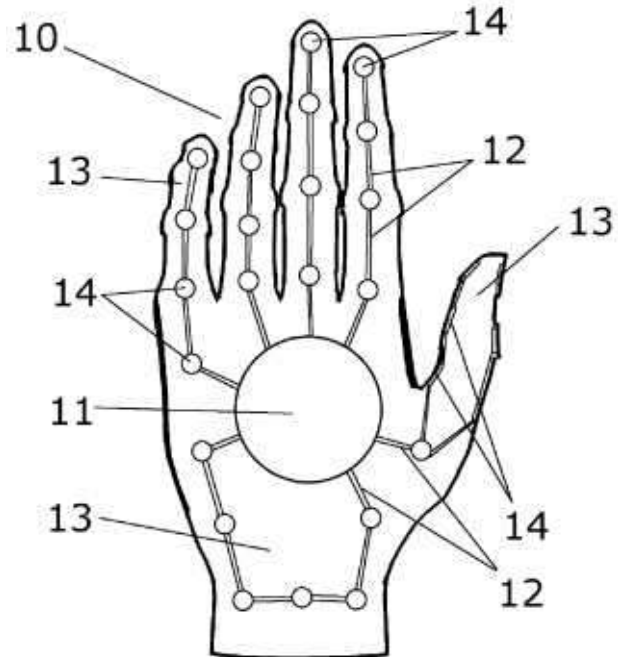
CI - A61N1/0452 (EP, US)
A61N1/0456 (EP, US)
A61N1/0484 (EP, US)

CA - A61N1/36021 (EP, US)

PA - OSBORNE LARRY [US]

TI - Medical Glove for
Electric **Stimulation**

AB - A medical glove for
electrical **stimulation** provides
electrodes, supplying low
voltage electric **current** for the
purpose of Transcutaneous
Electrical **Nerve Stimulation (TENS)**
for patients with chronic **pain** in
their hands, or Electrical
Muscle **Stimulation (EMS)** to assist
stroke patients in regaining
motor skills. The glove is battery-
powered, fits tightly on the
user's hand, and is preferably
manufactured from nylon fabric.



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PN - [US2014324119](#) A1 20141030

PNFP - US9265942 B2 20160223

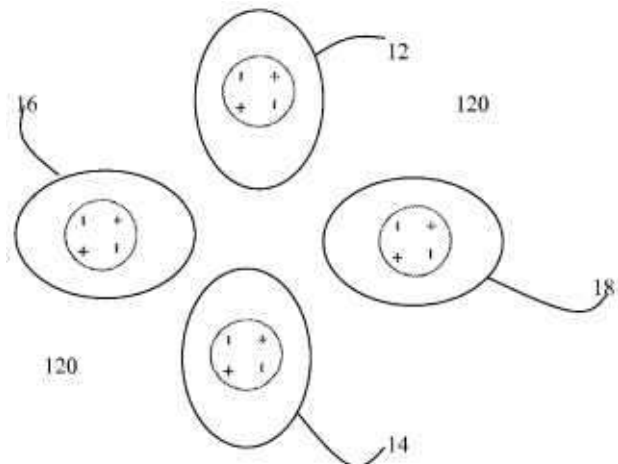
PR - US201414310511
20140620; US20100767720
20100426; US20070678528 20070223

AP - [US201414310511](#) 20140620

DT - **

CT - || R141 (A1)
[US6741889](#) B1 00000000 [];
[US6675045](#) B2 00000000 [];
[US5562718](#) A 00000000 [];
[US6445955](#) B1 00000000 []

- || STSE (B2)
[US5562718](#) A 00000000 [];
[US6445955](#) B1 00000000 [];
[US6675045](#) B2 00000000 []



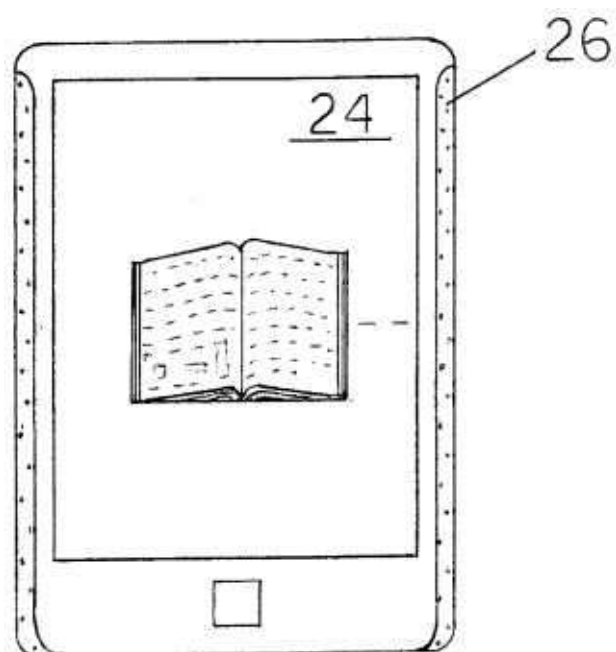
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CCI	- A61N1/36021 ; A61N2/008
CCA	- A61N1/0456
CI	- A61N1/36021 (EP, US) - A61N2/008 (EP, US)
CA	- A61N1/0456 (EP, US)
PA	- (A1 B2) GRADIENT TECHNOLOGIES LLC [US]
TI	- (A1) Transcutaneous Electrical Nerve Stimulation and Method Using Same - (B2) Transcutaneous electrical nerve stimulation and method using same
AB	- (A1 B2) The present disclosure relates to an apparatus and associated methods to produce analgesia in a mammal by providing an electrical nerve stimulus utilizing a pulsed input of low level electrical current , wherein the level of current is measurable with the measurements utilized to at least adjust the strength of the current according to selected parameters. Additionally, the use of magnets to produce a magnetic field to further control chronic and acute pain . In exemplary implementations, the apparatus maintains continuous monitoring of the electrical characteristics of TENS at the site of input and output, and the electrical input can be modified during treatment to obtain desired electrical input. More particularly the disclosure relates to an electromagnetic apparatus incorporating pulsed direct current , two or more electrodes, and at least two dipole antennae wherein the dipole antenna circuits receive and analyze signal from the dipole antennae, using the information from signal analysis

within the methods for producing analgesia in mammals. The strength of the **current** that the patient is receiving at the targeted site as the actual field is measured by the dipole antennae and adjustment is not dependent on subjective measurements to ascertain whether the proper amplitude, frequency and pulse duration are being applied.

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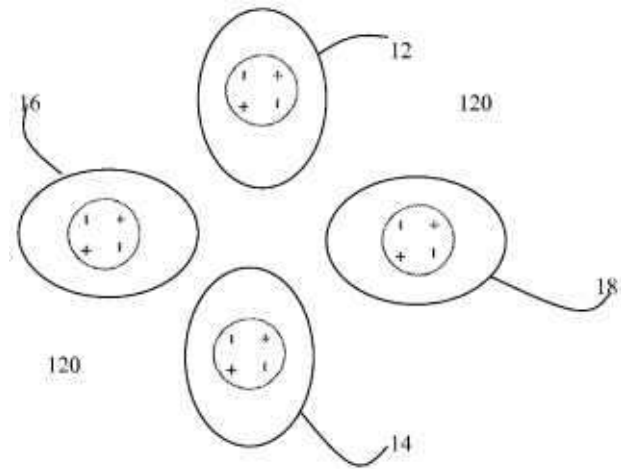
- PN - [US2013204741](#) A1 20130808
- PR - US201213427000
20120322; US201261594045P
20120202
- AP - [US201213427000](#) 20120322
- DT - *; Rep
- CT - // R141 (A1)
[US2009171418](#) A1 20090702 []
(SARIF NOOR INDRA BIN [SG], et al);
[US2013138716](#) A1 20130530 []
(MACWAN SANJAY [US], et al)
- CCI - [A61H39/002](#) ; [A61N1/0476](#) ;
[A61N1/36034](#)
- CCA - [A61H2201/5002](#) ; [A61H2201/5097](#) ;
[A61N1/0452](#) ; [A61N1/0456](#) ;
[A61N1/323](#) ; [A61N1/36021](#)
- CI - A61H39/002 (EP, US)
- A61N1/0476 (EP, US)
- A61N1/36003 (US)
- A61N1/36034 (EP, US)
- CA - A61H2201/5002 (EP, US)
- A61H2201/5097 (EP, US)
- A61N1/0452 (EP, US)
- A61N1/0456 (EP, US)
- A61N1/323 (EP, US)
- A61N1/36021 (EP, US)
- PA - UNDERWOOD WENDELL MARTIN
[US]
- TI - NEEDLE-LESS/WIRELESS
ACUPUNCTURE SYSTEM AND
METHOD
- AB - A bio-electricity system and
method utilizes electrical
muscle **stimulation**,



interferential **current**, micro-**current**, Russian **stimulation** and **tens**-transcutaneous electric **nerve stimulation**. The system and method are adapted for treating maladies of physically out-of-balance users according to the teachings of an ancient art. Such treatment is for **pain** relief, reduction of inflammation, decreasing muscle spasms and reduction of edema to other areas outside of the acupoint area. The system and method include a plurality of components including probes, adhesive, electronic components, an instruction manual, an electronic device and a program in the electronic device to wirelessly activate probes positioned on a user in accordance with the instruction manual.

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- PN - [US2010268299](#) A1 20101021
- PNFP - US8761891 B2 20140624
- PR - US20100767720
20100426; US20070678528 20070223
- AP - [US20100767720](#) 20100426
- DT - **
- CT - || R141 (A1)
[US6351674](#) B2 20020226 []
(SILVERSTONE LEON M [US]);
[US2004138723](#) A1 20040715 []
(MALICK CRISTA [US], et al);
[US6741889](#) B1 20040525 []
(HOLCOMB ROBERT R [US]);
[US6675045](#) B2 20040106 [] (MASS
WILLIAM R [US], et al);
[US2004106967](#) A1 20040603 []
(VON ARX JEFFREY A [US], et al);
[US4515167](#) A 19850507 []
(HOCHMAN JOEL S [US]);
[US7162302](#) B2 20070109 [] (WANG
XINGWU [US], et al);
[US4431002](#) A 19840214 []
(MAURER DONALD D [US], et al);
[US5284144](#) A 19940208 []
(DELANNOY JOSE [US], et al);



	US7072715 B1 20060704 [] (BRADLEY KERRY [US]); US6445955 B1 20020903 [] (MICHELSON STEPHEN A [US], et al); US5562718 A 19961008 [] (PALERMO FRANCIS X [US])
	- STSE (B2) US4515167 A 19850507 [] (HOCHMAN JOEL S [US]); US6351674 B2 20020226 [] (SILVERSTONE LEON M [US]) ; US6675045 B2 20040106 [] (MASS WILLIAM R [US], et al); US6741889 B1 20040525 [] (HOLCOMB ROBERT R [US]); US2004106967 A1 20040603 [] (VON ARX JEFFREY A [US], et al); US2004138723 A1 20040715 [] (MALICK CRISTA [US], et al)
CCI	- A61N1/36021 ; A61N2/008
CCA	- A61N1/0456
CI	- A61N1/36021 (EP, US) - A61N2/008 (EP, US)
CA	- A61N1/0456 (EP, US)
PA	- (A1) GRADIENT TECHNOLOGIES LLC [US] - (B2) FARONE WILLIAM [US]; GRADIENT TECHNOLOGIES LLC [US]
TI	- (A1) Transcutaneous Electrical Nerve Stimulation and Method Using Same - (B2) Transcutaneous electrical nerve stimulation and method using same
AB	- (A1 B2) The present disclosure relates to an apparatus and associated methods to produce analgesia in a mammal by providing an electrical nerve stimulus utilizing a pulsed input of low level electrical current , wherein the level of current is measurable with the measurements utilized to at least adjust the strength of the current according to selected parameters. Additionally, the

use of magnets to produce a magnetic field to further control chronic and acute **pain**. In exemplary implementations, the apparatus maintains continuous monitoring of the electrical characteristics of **TENS** at the site of input and output, and the electrical input can be modified during treatment to obtain desired electrical input. More particularly the disclosure relates to an electromagnetic apparatus incorporating pulsed direct **current**, two or more electrodes, and at least two dipole antennae wherein the dipole antenna circuits receive and analyze signal from the dipole antennae, using the information from signal analysis within the methods for producing analgesia in mammals. The strength of the **current** that the patient is receiving at the targeted site as the actual field is measured by the dipole antennae and adjustment is not dependent on subjective measurements to ascertain whether the proper amplitude, frequency and pulse duration are being applied.

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PN - [US2008207985](#) A1 20080828

PNFP - US7706885 B2 20100427

PR - US20070678528 20070223

AP - [US20070678528](#) 20070223

DT - **

CT - || R141 (A1)

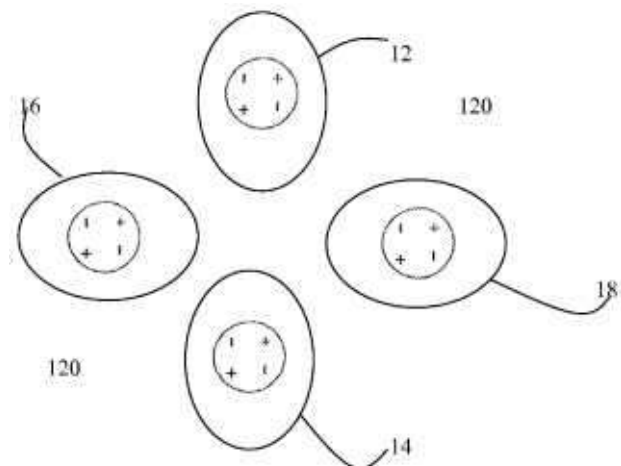
[US6675045](#) B2 20040106 [] (MASS WILLIAM R [US], et al);

[US6741889](#) B1 20040525 [] (HOLCOMB ROBERT R [US]);

[US6445955](#) B1 20020903 [] (MICHELSON STEPHEN A [US], et al);

[US5562718](#) A 19961008 [] (PALERMO FRANCIS X [US]);

[US4431002](#) A 19840214 [] (MAURER DONALD D [US], et al);

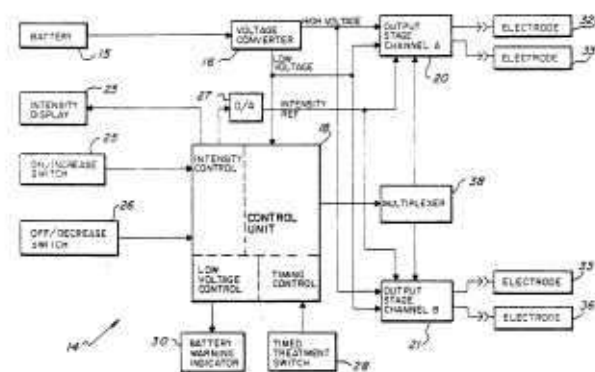


	US5284144 A 19940208 [] (DELANNOY JOSE [US], et al); US7072715 B1 20060704 [] (BRADLEY KERRY [US]); US7162302 B2 20070109 [] (WANG XINGWU [US], et al)
	- STSE (B2) US5562718 A 19961008 [] (PALERMO FRANCIS X [US]); US6445955 B1 20020903 [] (MICHELSON STEPHEN A [US], et al); US6675045 B2 20040106 [] (MASS WILLIAM R [US], et al); US6741889 B1 20040525 [] (HOLCOMB ROBERT R [US])
CCI	- A61N1/36021 ; A61N2/008
CCA	- A61N1/0456
CI	- A61N1/36021 (EP, US) - A61N2/008 (EP, US)
CA	- A61N1/0456 (EP, US)
PA	- (A1 B2) GRADIENT TECHNOLOGIES LLC [US]
TI	- (A1) TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION AND METHOD OF USING SAME - (B2) Transcutaneous electrical nerve stimulation and method of using same
AB	- (A1 B2) The present disclosure relates to an apparatus and associated methods to produce analgesia in a mammal by providing an electrical nerve stimulus utilizing a pulsed input of low level electrical current, wherein the level of current is measurable with the measurements utilized to at least adjust the strength of the current according to selected parameters. Additionally, the use of magnets to produce a magnetic field to further control chronic and acute pain. In exemplary implementations, the apparatus maintains continuous monitoring of the electrical characteristics of TENS at the site

of input and output, and the electrical input can be modified during treatment to obtain desired electrical input. More particularly the disclosure relates to an electromagnetic apparatus incorporating pulsed direct **current**, two or more electrodes, and at least two dipole antennas wherein the dipole antenna circuits receive and analyze signal from the dipole antennas, using the information from signal analysis within the methods for producing analgesia in mammals. The strength of the **current** that the patient is receiving at the targeted site as the actual field is measured by the dipole antennas and adjustment is not dependent on subjective measurements to ascertain whether the proper amplitude, frequency and pulse duration are being applied.

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- PN - [US5065083](#) A 19911112
- PR - US19890398754 19890825
- AP - [US19890398754](#) 19890825
- DT - *; Rep
- CT - || STSE (A)
[US3979657](#) A 00000000 [];
[US4380726](#) A 00000000 [];
[US4632117](#) A 00000000 [];
[US4703247](#) A 00000000 [];
[US4726052](#) A 00000000 [];
[US4908523](#) A 00000000 []
- CCI - [A61N1/36021](#); [A61N1/378](#);
[G01R19/16542](#); [G01R31/3648](#);
[H02J7/0031](#)
- CI - A61N1/36021 (EP)
A61N1/378 (EP)
G01R19/16542 (EP)
G01R31/3648 (EP)
H02J7/0031 (EP)
- PA - STAODYN INC [US]
- TI - Microprocessor controlled



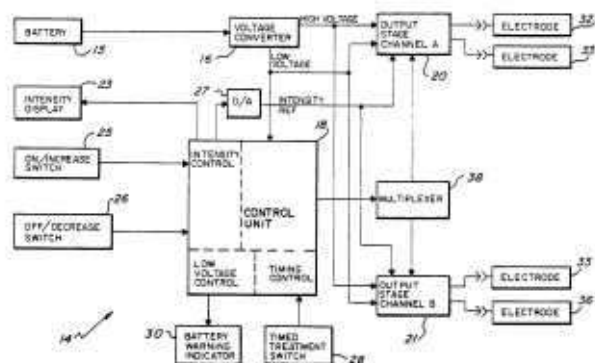
electronic **stimulating** device
having a battery management
system and method therefor

AB

- A device and method are disclosed for effecting battery management in a battery powered electronic **stimulating** device, with the **stimulating** device particularly illustrated being a transcutaneous **nerve stimulating (TENS)** device for effecting suppression of **pain** by **nerve** fiber **stimulation**. The output power is in the form of biphasic constant **current** output pulses generated at one or more biphasic output stages. Each output stage receives high voltage, derived from the battery, along with microprocessor generated control pulses. Battery management is effected by detecting predetermined voltage levels and responsive thereto decrementing the output power to maintain the battery voltage at a selected lower level with termination of operation occurring when such decrementing can no longer maintain the lower battery voltage. A battery warning indicator is also provided for advising of battery condition.

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- PN - [US5063929](#) A 19911112
- PR - US19890398734 19890825
- AP - [US19890398734](#) 19890825
- DT - *, Rep
- CT - || STSE (A)
[US4124028](#) A 00000000 [];
[US4338945](#) A 00000000 [];
[US4408609](#) A 00000000 [];
[US4580570](#) A 00000000 [];
[US4669477](#) A 00000000 [];
[US4782837](#) A 00000000 []
- CCI - [A61N1/36021](#)
- CCA - [A61N1/025](#) ; [A61N1/37247](#)
- CI - A61N1/36021 (EP)



CA - A61N1/025 (EP)
 - A61N1/37247 (EP)

PA - STAODYN INC [US]

TI - Electronic **stimulating** device
 having timed treatment of
 varying intensity and method
 therefor

AB - A device and method are
 disclosed for effecting timed
 treatment of varying intensity in
 an electronic **stimulating** device,
 with the **stimulating** device
 particularly illustrated being a
 transcutaneous **nerve stimulating**
(TENS) device for effecting
 suppression of **pain by nerve**
 fiber **stimulation**. Biphasic
 constant **current** output pulses
 are applied to a user through
 electrode pairs noninvasively
 positioned at the skin of the
 user. Microprocessor generated
 control pulses control generation
 of the biphasic output pulses at
 a biphasic output stage
 associated with each electrode
 pair. **Stimulation** may be
 continuously applied at a level
 selected by the user or may be
 applied in timed varying
 intensities the maximum level of
 which is selectable, with a
 display also being provided of
 selected and applied intensity
 levels.

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PN - [CA1335302](#) C 19950418

PR - US19890398738 19890825

AP - [CA19890613689](#) 19890927

DT - I

CCI - [A61N1/36021](#)

CCA - [A61N1/326](#) ; [A61N1/3782](#)

CI - A61N1/36021 (EP)

CA - A61N1/326 (EP)
 - A61N1/3782 (EP)

PA - STAODYN INC [US]

TI - MICROPROCESSOR CONTROLLED ELECTRONIC **STIMULATING** DEVICE HAVING BIPHASIC PULSE

OUTPUT

- AB - An electronic **stimulating** device is disclosed, with the **stimulating** device particularly illustrated being a transcutaneous **nerve stimulating (TENS)** device for effecting suppression of **pain** by **nerve** fiber **stimulation**. Biphasic constant **current** output pulses are applied to a user through electrode pairs noninvasively positioned at the skin of the user. Microprocessor generated control pulses control generation of the biphasic output pulses at a biphasic output stage associated with each electrode pair, and the generated biphasic output pulses are capacitively coupled from each output stage which also includes a bleeder network for effecting capacitor discharge. **Stimulation** may be continuously applied at a level selected by the user or may be applied in timed varying intensities the maximum level of which is selectable, and displays of intensity and sensed faults, including low battery voltage, are also provided.

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PN - [WO2008103977](#) A2 20080828

PNFP - WO2008103977 A3 20081204

PR - US20070678528 20070223

AP - [WO2008US54855](#) 20080225

DT - *; Rep

CT - *[US] ISR (A3)*
[US6741889](#) B1 00000000 [Y];
[US6675045](#) B2 00000000 [Y];
[US7162302](#) B2 00000000 [Y];
[US5284144](#) A 00000000 [A];
[US7072715](#) B1 00000000 [A]

CCI - [A61N1/36021](#) ; [A61N2/008](#)

CCA - [A61N1/0456](#)

CI - A61N1/36021 (EP, US)

- A61N2/008 (EP, US)

CA - A61N1/0456 (EP, US)

PA - (A2 A3)
GRADIENT TECHNOLOGIES LLC [US]

TI - (A2 A3)
TRANSCUTANEOUS ELECTRICAL **NERVE STIMULATION** AND METHOD OF USING SAME

AB - (A2)
The present disclosure relates to an apparatus and associated methods to produce analgesia in a mammal by providing an electrical **nerve** stimulus utilizing a pulsed input of low level electrical **current**, wherein the level of **current** is measurable with the measurements utilized to at least adjust the strength of the **current** according to selected parameters. Additionally, the use of magnets to produce a magnetic field to further control chronic and acute **pain**. In exemplary implementations, the apparatus maintains continuous monitoring of the electrical characteristics of **TENS** at the site of input and output, and the electrical input can be modified during treatment to obtain desired electrical input. More particularly the disclosure relates to an electromagnetic apparatus incorporating pulsed direct **current**, two or more electrodes, and at least two dipole antennas wherein the dipole antenna circuits receive and analyze signal from the dipole antennas, using the information from signal analysis within the methods for producing analgesia in mammals. The strength of the **current** that the patient is

receiving at the targeted site as the actual field is measured by the dipole antennas and adjustment is not dependent on subjective measurements to ascertain whether the proper amplitude, frequency and pulse are being applied.

- (A3)

The present disclosure relates to an apparatus and method to produce analgesia in a mammal by providing an electrical **nerve** stimulus utilizing a pulsed input of low level electrical **current**, which is measured to adjust the strength of the **current** according to selected parameters. For example, the apparatus continuously monitors the electrical characteristics of **TENS** at the site of input and output. The electrical input can be modified during treatment to obtain desired electrical input. More specifically, an electromagnetic apparatus incorporates pulsed direct **current**, two or more electrodes, and at least two dipole antennas. The dipole antenna circuits receive and analyze signal from the dipole antennas, using the information from signal analysis within the methods for producing analgesia in mammals. The strength of the **current** is measured by the dipole antennas to ascertain whether the proper amplitude, frequency and pulse duration are being applied.

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PN - [EP0414248](#) A2 19910227

PNFP - EP0414248 A3 19911204

PR - US19890398738 19890825

AP - [EP19900116187](#) 19900823

DT - *; Rep

CT - // STSE (A3)

[US4541432](#) A 19850917 [A] (MOLINA-NEGRO PEDRO [CA], et al);

[US4719922](#) A 19880119 [A] (PADJEN ANTE L [CA], et al);

[US4210150](#) A 19800701 [AD] (JAMES DONALD N [US])

CCI - [A61N1/36021](#)

CCA - [A61N1/326](#); [A61N1/3782](#)

CI - A61N1/36021 (EP)

CA - A61N1/326 (EP)

- A61N1/3782 (EP)

PA - (A2)

STAODYNAMICS INC [US]

TI - (A2)

Microprocessor controlled electronic **stimulating** device having biphasic pulse output.

- (A3)

MICROPROCESSOR CONTROLLED ELECTRONIC **STIMULATING** DEVICE HAVING BIPHASIC PULSE OUTPUT

AB - (A2)

An electronic **stimulating** device is disclosed, with the **stimulating** device particularly illustrated being a transcutaneous **nerve stimulating (TENS)** device for effecting suppression of **pain by nerve fiber stimulation**. Biphasic constant **current** output pulses are applied to a user through electrode pairs (32,33;35,36) noninvasively positioned at the skin of the user. Microprocessor generated control pulses control generation of the biphasic output pulses at a biphasic output stage associated with each electrode pair, and the generated biphasic output pulses are capacitively coupled from each output stage which also includes a bleeder network (92,93) for effecting capacitor

discharge. **Stimulation** may be continuously applied at a level selected by the user or may be applied in timed varying intensities the maximum level of which is selectable, and displays (23,30) of intensity and sensed faults, including low battery voltage, are also provided.

TXT - **stimulating** device (**TENS**) ,biphasic pulse

[SS 19]