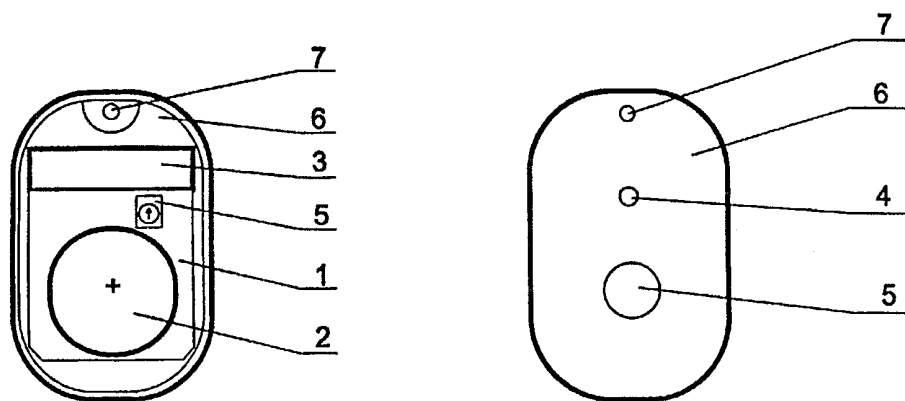




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US00/09560 (22) International Filing Date: 10 April 2000 (10.04.00) (30) Priority Data: P-9900086 9 April 1999 (09.04.99) SI (71) Applicant (for all designated States except US): POWER OF NATURE, LLC [US/US]; Suite 110, 999 Anderson Drive, San Rafael, CA 94901 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): POZNIK, Vili [SI/SI]; Celovska 10, 3000 Celje (SI). RESNIK, Franc [SI/SI]; Trnovljaska c. 71, 3000 Celje (SI). (74) Agents: JOHNSON, Larry, D. et al.; Johnson & Stainbrook, LLP, Suite 130, 175 N. Redwood Dr., San Rafael, CA 94903 (US).		(81) Designated States: JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: GENERATOR OF PULSATING MAGNETIC FIELD**(57) Abstract**

A generator of pulsating magnetic fields allows a patient or treatment administrator to choose a single frequency which is comfortable for a patient whereby the frequency relates to a magnetic impulse of a particular intensity magnetic field. The device is miniaturized so it can be worn around the neck as a pendant or can be attached to any body part being treated. The generator emits the frequency chosen by the patient or treatment administrator depending on the desired effect of the therapy. The device includes an electrical circuit (1), an alkaline battery (2), a ferromagnetic core coil (3), an LED diode for control of operation (4), a switch for operational control (5), and a housing (6).

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GENERATOR OF PULSATING MAGNETIC FIELD

DESCRIPTION

5 TECHNICAL FIELD

Generator of pulsating magnetic field, medicinal accessories, therapeutic accessories.

BACKGROUND ART

The invention deals with such a design for generator of
10 pulsing magnetic field which will allow for choice of a
single frequency of the field most comfortable for the
user whereby the frequency refers to magnetic impulse of
appropriate intensity. The device should be of such size
that the user would be able to use it by hanging it around
15 neck as necklace, or attach it in proximity of body part
in need of treatment.

DISCLOSURE OF INVENTION

The invention is improved version of the invention as
published and protected in patent with shortened duration
20 SI 9500048. For reasons of brevity the inventor is hereby
referring to and incorporating said patent by reference.

The subject of invention presented herein is a generator
of pulsating magnetic field emitting specifically
engineered magnetic impulses of the form essentially
25 presented in patent with shortened duration SI 9500048,
Fig. 3 of duration essentially $t=52\mu\text{s}$ with maximum
magnetic field of $B_t=250\mu\text{T}$ and capability of continuous
regulation of the frequency in range between 1,7 Hz and 28

Hz. In particular embodiments the time of duration of said impulse is $t=52\mu s \pm 5\%$ which presents a novelty when compared with existing state of the art. In addition, design capable of miniaturization and user-friendliness is
5 also considered novel.

The generator of pulsating magnetic field enables, by way of example, the choice of a single frequency of said field, said frequency the most beneficial for an user. A
10 frequency refers to frequency of the field of appropriate intensity as presented in this application. A device generating said field with said frequency is of such, miniature, size that the user can wear it around the neck as necklace, or attach it close to the body part in need
15 of treatment. The generator of pulsating magnetic field shall emit frequency chosen by the user and/or person administering a treatment, said frequency depending on desired effect of subject of invention on the user.

20 A particular frequency of the pulsating magnetic field as emitted by the generator has been found to be of particular relevance for the user as follows:

Frequency of essentially 7.83 Hz is particularly
25 beneficial for the user suffering of at least one of the following symptoms: accelerated heartbeat, inappropriate (high or low) blood pressure, prostate infection or inflammation, neurosis, travel anxiety, insomnia, stress,

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fear and/or anxiety, climacteric problems;

Frequency of essentially 2 Hz is particularly beneficial
for the sensible user in state of fear and/or stress
5 and/or insomnia;

Frequency of essentially 3.9 Hz is particularly beneficial
for the sensible user in state of fear and/or stress
and/or insomnia and/or the user suffering from
10 incontinence;

Frequency of essentially 5 Hz is particularly beneficial
for the sensible user in state of fear and/or stress
and/or insomnia and/or the user suffering from
15 incontinence;

Frequency of essentially 10 Hz is particularly beneficial
for the user suffering of at least one of the following
symptoms: abdominal pain, swelling of various origins,
20 insomnia;

Frequency of essentially 12 Hz is particularly beneficial
for the user suffering of at least one of the following
symptoms: headache, migraine, rheumatic inflammations,
25 asthma, disorders of arterial or vein lymph circulation,
painful menstruation, dizziness, skin allergy, wounds due
to prolonged stay in bed, edema of joints, psoriasis,
wounds;

Frequency of essentially 15.6 Hz is particularly beneficial for the user suffering of at least one of the following symptoms: skeletal pain, lumbar pain, cervical
5 pain, rib cage pain, extremities and joints pain;

Frequency of essentially 20 Hz is particularly beneficial for the user suffering of at least one of the following symptoms: nerve inflammation, muscular pain;

10

Frequency of essentially 22 Hz is particularly beneficial for the user suffering of at least one of the following symptoms: peripheral paresis of face nerve, low blood pressure, psychosomatic syndrome;

15

Frequency of essentially 23.49 Hz is particularly beneficial for the user suffering of at least one of the following symptoms: bone fractures and/or sports injury, severe pain, lowered resistance and/or general conditions
20 at lower biorhythm;

Frequency in particular regime of operation whereby the device during the first phase of approximately 45 minutes emits frequency of essentially 40 Hz to be followed by the
25 second phase of emitting frequency of essentially 19.5 Hz whereby said regime is particularly beneficial for the user suffering of at least one of the following symptoms: drug use side effects, acute pain;

Frequency in particular regime of operation whereby during the day the device emits pulsating magnetic field of frequency of essentially 19 Hz, and of frequency of
5 essentially 2 Hz during the night.

The frequency is chosen by either user, or person administering treatment using the subject of this invention, said frequency assumed to be most beneficial
10 for the user.

The present invention is further explained with help of embodiments as described below and reference to the accompanying drawings whereby the drawings form part of
15 this patent application and describe:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows electrical circuit (1), alkaline battery B1 (2), coil with Fe core L1 (3), LED diode for control of operation D3 (4), switch for turning the device on and off
20 and control of operation SW1 (5), and housing (6);

Figure 2 shows a schematic diagram of the generator according to the first embodiment comprising the elements
25 IC1, IC2, IC3, T1, D1, D2, D3, R1, R2, R3, R4, R5, C1, C2, C3, C4, C5, SW1, P1;

Figure 3 shows a schematic diagram of the generator

according to the second embodiment comprising the elements IC1, IC2, T1, D1, D2, R1, R2, R3, R4, R5, R6, R7, R8, C1, C2, C3, C4, C5, SW1, P1;

- 5 Figure 4 shows a schematic diagram of the generator according to the first embodiment comprising the elements IC1, T1, D3, R1, R2, R3, R4, R5, C1, C2, Ce1, SW1, Q1.

BEST MODE FOR CARRYING OUT THE INVENTION

- 10 In the first embodiment the present invention comprises the printed circuit comprising the following elements:
integrated circuit IC1 of 4093 type, IC2 of 4093 type, IC3 or 74HC74 type;
transistor T1 of NPN type 0.2A;
15 diodes D1 of 1N4148 type, D2 of 1N4148 type, D3 of LED green type (4);
resistors R1 of 33 k Ω , R2 of 1500 Ω , R3 of 330 k Ω , R4 of 3300 k Ω , R5 of 10 M Ω ;
capacitors C1 of 1nF, C2 of tantalum of 33 μ F, C3 of
20 tantalum of 1 μ F, C4 of 47nF, C5 of 220 nF;
switch SW1;
potentiometer P1 of 2 M Ω ;
whereby the connections between the elements is seen in Figure 2. The IC of 4093 type enables switch of 1V at 3V.
25 The values shown are used for setting the frequency from 1.7 Hz to 28 Hz whereby the frequency is set by turning the potentiometer P1. Resistor R2 is used to set current through the a L1 (3) of 145 mA \pm 5%. The length of impulse

in this embodiment is formed using elements R1 and C2. The coil L1 (3) is connected to the circuit as described, said coil transforming amplified impulses in corresponding magnetic field with appropriate frequency and intensity.

5 Further, a battery B1 (2), usually alkaline, is connected to the circuit and used for powering of the generator. The switch SW1 (5) is used for turning the device on and off and control of the operation. In this embodiment a short depressing of said switch will turn the device on, longer

10 depressing (approx. 3 seconds duration) will turn the device off, depressing of said switch with generator already running will perform control of operation of the device. LED diode (4) is used for the generator operation control. In this embodiment the diode will flash for

15 predetermined period (in this embodiment 8 seconds) in the rhythm of predetermined frequency. After expiration of predetermined period the LED diode turns off to save energy while the generator continues with operation until it is switched off using the switch as previously

20 described. The control of operation is performed by depressing the switch with the generator in operation. The LED diode responds as at commencement of the generator operation - flashes for predetermined period and then turns off. Potentiometer P1 is used for continuous setting of

25 frequency magnetic impulses.

In the second embodiment the present invention comprises the printed circuit comprising the following elements:

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integrated circuit IC1 of 4011 type, IC2 of 74HC00 type;
transistor T1 of PNP type 0.2A;
diodes D1 of 1N4148 type, D2 of LED green type (4);
resistors R1 of 2.2 M Ω , R2 of 680 k Ω , R3 of 82 k Ω , R4 of
5 270 E, R5 of 2200 Ω ; R6 of 10 M Ω ; R7 of 12 k Ω ; R8 of 4.7
M Ω ;
capacitors C1 of 220nF, C2 of 1 nF, C3 47 nF, C4 of 1 μ F,
C5 of 33 μ F;
switch SW1;
10 potentiometer P1 of 4.7 M Ω ;
whereby the connections between the elements is seen in
Figure 3. The coil L1 (3) is connected to the circuit as
described, said coil transforming amplified impulses in
corresponding magnetic field with appropriate frequency
15 and intensity. Further, a battery B1 (2), usually
alkaline, is connected to the circuit and used for
powering of the generator. The switch SW1 (5) is used for
turning the device on and off and control of the
operation. In this embodiment a short depressing of said
20 switch will turn the device on, longer depressing (approx.
3 seconds duration) will turn the device off, depressing
of said switch with generator already running will perform
control of operation of the device. LED diode (4) is used
for the generator operation control. In this embodiment
25 the diode will flash for predetermined period (in this
embodiment 8 seconds) in the rhythm of predetermined
frequency. After expiration of predetermined period the

LED diode turns off to save energy while the generator continues with operation until it is switched off using the switch as previously described. The control of operation is performed by depressing the switch with the
5 generator in operation. The LED diode responds as at commencement of the generator operation - flashes for predetermined period and then turns off. Potentiometer P1 is used for continuous setting of frequency magnetic impulses.

10

In the third embodiment the present invention comprises the printed circuit comprising the following elements:
integrated circuit IC1 of PIC 12C508 type; a program is entered in the microprocessor IC1 whereby IC1 controls
15 length and frequency of the magnetic impulse, generates impulse for LED diode D3 (4) flashing with 1,6 Hz during operation of the device as described in this embodiment, and may limit the duration of the device operation to predetermined time, in this embodiment to 5 hours;
20 transistor T1 of NPN type 200 mA;
diode D3 of LED green type (4);
resistors R1 of 2 kO, R2 of 220 E, R3 of 10 kO, R4 of 100 kO, R5 of 1.2 kO;
capacitors C1 of 22 pF, C2 of 22 pF, Ce1 of 33 μ F;
25 switch SW1;
crystal Q1 with frequency of 77.5 Hz;
whereby the connections between the elements is seen in Figure 4. The coil L1 (3) is connected to the circuit as

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described, said coil transforming amplified impulses in corresponding magnetic field with appropriate frequency and intensity. Further, a battery B1 (2), usually alkaline, is connected to the circuit and used for
5 powering of the generator. The switch SW1 (5) is used for turning the device on and off and control of the operation. In this embodiment a short depressing of said switch will turn the device on, longer depressing (approx. 3 seconds duration) will turn the device off. LED diode
10 (4) is used for the generator operation control. In this embodiment the diode will flash throughout generator operation. In an additional embodiment the generator stops operation after predetermined period has elapsed (in this additional embodiment after five hours of operation).
15 Resistor R1 uses active justification to set the current during L1 coil (3), in this embodiment $145 \text{ mA} \pm 5\%$.

Each of described embodiments is capable of having frequency set at the time of circuit manufacture or
20 assembly resulting in simpler operation (in the user's view). The subject of the invention can be manufacture in appropriate size to enable wearing it around neck or attaching it close to body part in need of treatment.

25 It is self evident that the described invention can be used in different embodiment without changing the essence of the invention.

CLAIMS

What is claimed as invention is:

- 5 1. A generator of a pulsating magnetic field, characterized in that it emits particularly formed magnetic impulses of essentially 52 μ s duration and field strength up to 250 μ T.
2. A generator of a pulsating magnetic field,
10 characterized in that a frequency of said magnetic impulses is continuously settable between 1.7 and 28 Hz.
3. A generator of a pulsating magnetic field, characterized in that it is comprising magnetic field generating means, magnetic field forming means, magnetic
15 field frequency setting means and control means connected thereto.
4. Invention according any of the preceding claims, characterized in that it is comprising a switch (5) for turning on, turning off, and control of operation of the
20 subject of the invention.
5. Invention according any of the preceding claims, characterized in that it is comprising a switch (5) for turning on and turning off, and LED diode (4) for control of operation of said generator.
- 25 6. Invention according to any of the preceding claims, characterized in that the subject of the invention ceases to operate after predetermined period of time.
7. Invention according to any of the preceding claims,

characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 7.83 Hz which is particularly beneficial for the user suffering of at least one of the following symptoms: accelerated
5 heartbeat, inappropriate (high or low) blood pressure, prostate infection or inflammation, neurosis, travel anxiety, insomnia, stress, fear and/or anxiety, climacteric problems.

8. Invention according to any of the preceding claims,
10 characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 2 Hz which is particularly beneficial for the sensible user in state of fear and/or stress and/or insomnia.

9. Invention according to any of the preceding claims,
15 characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 3.9 Hz which is particularly beneficial for the sensible user in state of fear and/or stress and/or insomnia and/or the user suffering from incontinence.

20 10. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 5 Hz which is particularly beneficial for the sensible user in state of fear and/or stress and/or insomnia and/or the
25 user suffering from incontinence.

11. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 10 Hz

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which is particularly beneficial for the user suffering of at least one of the following symptoms: abdominal pain, swelling of various origins, insomnia.

12. Invention according to any of the preceding claims,
5 characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 12 Hz which is particularly beneficial for the user suffering of at least one of the following symptoms: headache, migraine, rheumatic inflammations, asthma, disorders of
10 arterial or vein lymph circulation, painful menstruation, dizziness, skin allergy, wounds due to prolonged stay in bed, edema of joints, psoriasis, wounds.

13. Invention according to any of the preceding claims, characterized in that the subject of the invention emits
15 said magnetic impulses at frequency of essentially 15.6 Hz which is particularly beneficial for the user suffering of at least one of the following symptoms: skeletal pain, lumbar pain, cervical pain, rib cage pain, extremities and joints pain.

20 14. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 20 Hz which is particularly beneficial for the user suffering of at least one of the following symptoms: nerve
25 inflammation, muscular pain.

15. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 22 Hz

which is particularly beneficial for the user suffering of at least one of the following symptoms: peripheral paresis of face nerve, low blood pressure, psychosomatic syndrome.

16. Invention according to any of the preceding claims,
5 characterized in that the subject of the invention emits said magnetic impulses at frequency of essentially 23.49 Hz which is particularly beneficial for the user suffering of at least one of the following symptoms: bone fractures and/or sports injury, severe pain, lowered resistance
10 and/or general conditions at lower biorhythm.

17. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency in particular regime of operation whereby the device during the first phase of
15 operation of approximately 45 minutes duration emits frequency of essentially 40 Hz to be followed by the second phase of emitting frequency of essentially 19.5 Hz whereby said regime is particularly beneficial for the user suffering of at least one of the following symptoms:
20 drug use side effects, acute pain.

18. Invention according to any of the preceding claims, characterized in that the subject of the invention emits said magnetic impulses at frequency in particular regime of operation whereby during the day the device emits
25 pulsating magnetic field of frequency of essentially 19 Hz, and of frequency of essentially 2 Hz during the night.

19. Invention according to any of the preceding claims, characterized in that it is manufactured in appropriate

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size to be worn around an user's neck or attached close to
an user's body part in need of treatment.

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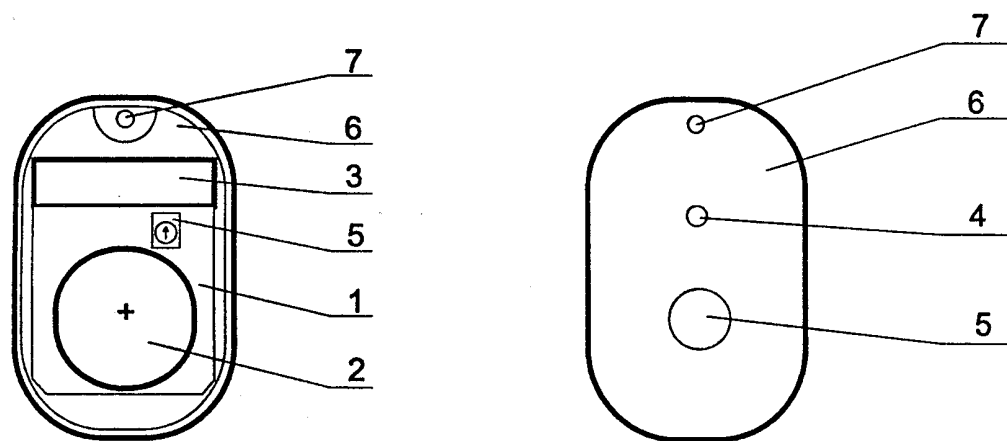


Fig. 1

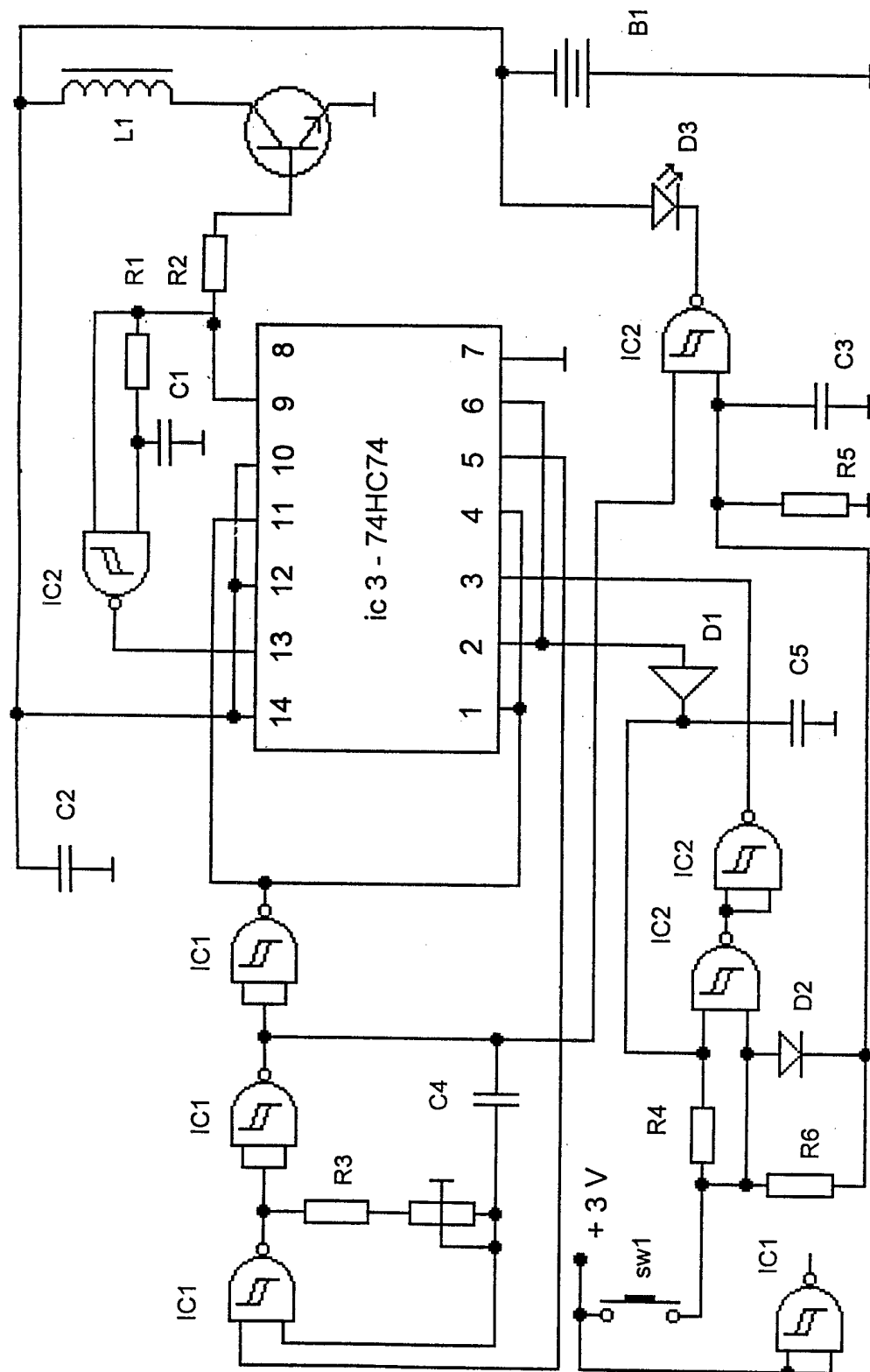


Fig. 2

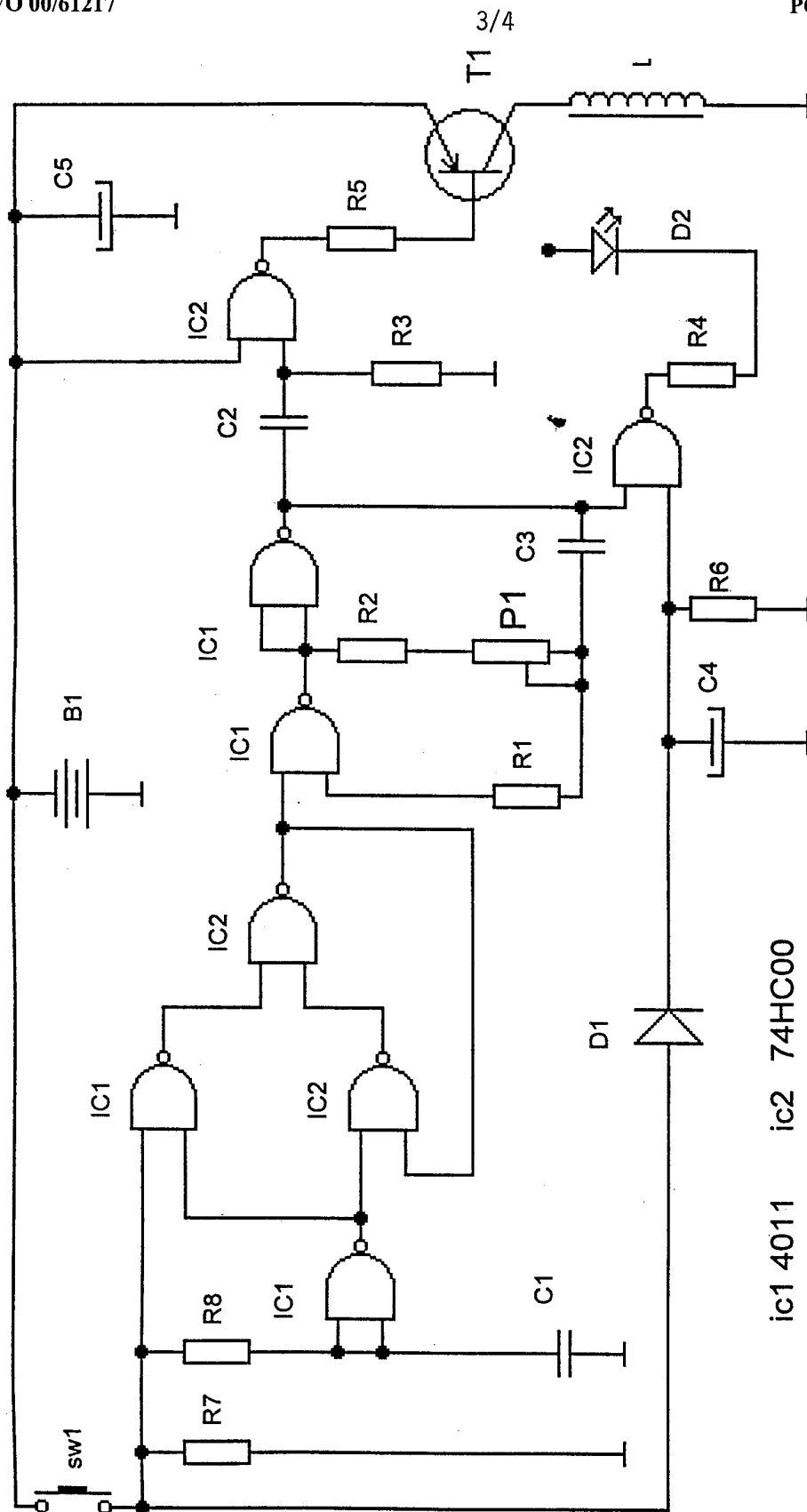


Fig. 3

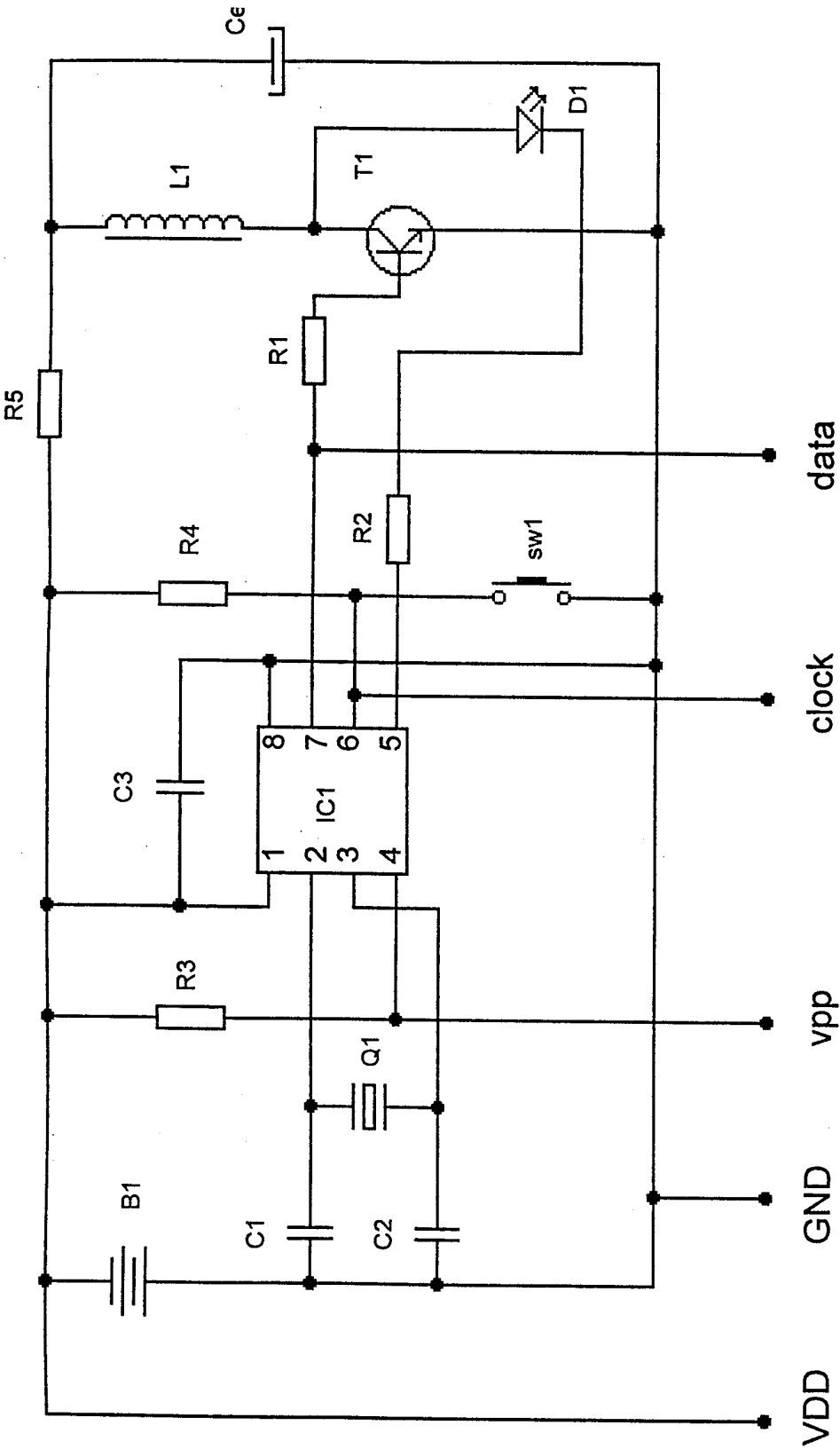


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/09560

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :A61N 1/00

US CL :600/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 600/9, 13-15

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,769,778 A (ABRAMS et al.) 23 June 1998, entire document.	2, 3 ----- 1
X	US 5,192,263 A (KRAUS) 09 March 1993, entire document.	1-3
X	US 4,989,604 A (FANG) 05 February 1991, entire document.	2
X	US 5,707,334 A (YOUNG) 13 January 1998, entire document.	3
A	US 5,478,303 A (FOLEY-NOLAN et al.) 26 December 1995, entire document.	1-3

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Date of the actual completion of the international search

16 AUGUST 2000

Date of mailing of the international search report

06 SEP 2000

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/09560

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-18
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.