

TM TAMAYO & ASOCIADOS
INTERNATIONAL PATENT AND TRADEMARK OFFICE

Trademark
Patent
Health Permit
Software
Commercial Name
Design

Marcas
Patentes
Registros Sanitarios
Soporte Lógico
Nombres Comerciales
Diseños

Señor
JEFE DIVISION DE NUEVAS CREACIONES
SUPERINTENDENCIA DE INDUSTRIA Y
E. S. D.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 07-022858-00002-0000

Fecha: 2007-05-04 16:30:45 Dep. 2020 NUECREACIONES
Tra. 11 PATENTEIYII Eje: 379 FASENACIONALII
Act. 329 CTOINFORMACION Folios: 65

REF: EXPEDIENTE : 07-022858

PATENTE PCT : "DISPOSITIVO DE CONSUMO DE ENERGIA
PORTATIL"

ACTUACION : COMPLEMENTO DE INFORMACION
: DOCUMENTOS ANEXOS AL PCTM.

Estimados señores:

Damos alcance a la solicitud de patente PCT Fase nacional, presentada ante su Despacho y radicada el día 07 de marzo de 2007 con expediente citado en la referencia, con el fin de presentar copias de documentos expedidos según el Tratado de Cooperación en Materia de Patentes, así:

1. Carta remisoría de pedido solicitando que la solicitud internacional siga el proceso, con su traducción al español formulario PCT/RO/101
2. Copia de la Publicación Internacional WO 2006/022871 A2
3. Copia de la Publicación Internacional WO 2006/022871 A3 con su traducción al español

Patentes
Registros Sanitarios
Deposito de Autor
Software

Carrera 13 A No. 28-38 Mz 2 Bufete 245 Parque Central Bavaria
Tel. (57 1) 341 9841 - FAX (57 1) 336 8592 - Cel. (315) 317 1181
E-mails: consultas@tmtamayo.net, carlos.tamayo@tmtamayo.net
www.tmtamayo.com / Bogotá D.C., COLOMBIA, S.A.



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Diseños

105 /

Ruego a usted tener en cuenta los anteriores documentos y una vez finiquitada esta diligencia, ordenar lo pertinente para que el expediente siga su curso normal.

Del señor Jefe,

CARLOS ORLANDO MAYA RODRIGUEZ

No.17.117.818 expedida en Bogotá,

T.P No. 17.402 del C.S.J.

TM

Patentes
Registros Sanitarios
Derechos de Autor
Software

Carrera 13 A No. 28-38 Mz 2 Bufette 245 Parque Central Bavaria
Tel. (57 1) 341 9841 - FAX (57 1) 336 8592 - Cel. (315) 317 1181
E-mails: consultas@tmtamayo.net, carlos.tamayo@tmtamayo.net
www.tmtamayo.com / Bogotá D.C., COLOMBIA, S.A.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) 090238800038

Box No. I TITLE OF INVENTION PORTABLE ENERGY CONSUMING DEVICE	
Box No. II APPLICANT ☐ This person is also inventor	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (see State of residence is indicated below.)	
POWERPULSE TECHNOLOGIES, L.P. 740 East Campbell Road Richardson, Texas 75081 United States of America 75081	
State (that is, country) of nationality: US	State (that is, country) of residence: US
This person is applicant for the purposes of: ☒ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (see State of residence is indicated below.)	
EVANYK, Walter R. 3200 Sherry Drive Plano, Texas 75074-4893 United States of America	
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
RADEN, James B. JONES DAY 77 West Wacker Chicago, Illinois 60601-1692 United States of America	
Telephone No. 312-269-4340	Facsimile No. 312-782-8585
Teleprinter No.	Agent's registration No. with the Office 24,594
☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Continuation of Box No. III <i>PL</i> OTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (if no State of residence is indicated below.)</i> LONG, Tim 202 Utah Street Sherman, Texas 75090 United States of America	This person is: ☐ applicant only ☐ applicant and inventor ☒ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this box is the applicant's State (that is, country) of residence (if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Supplemental Box If the Supplemental Box is not used, this sheet should not be included in the request.

1. If in any of the Boxes, except Boxes Nos. VII(2) to (4) for which a special continuation has been provided, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." (indicate the number of the Box) and furnish the information in the same manner as required according to the caption of the Box in which the space was insufficient, in particular:
 - (a) If more than two persons are to be indicated as applicants under invention and an "invention sheet" is available: in such case, write "Continuation of Box No. II" and indicate for each additional person the same type of information as required in Box No. II. The country of the address indicated in this Box is the applicant's State (that is, country) of residence (the State of residence is indicated below);
 - (b) If in Box No. II or in any of the sub-items of Box No. II, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (in the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (or, where applicable, ABPO, European, European or OAPI patent) for the purpose of which the named person is applicant;
 - (c) If in Box No. II or in any of the sub-items of Box No. II, the inventor or the inventor-applicant is not inventor for the purpose of all designated States or for the purpose of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (in the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (or, where applicable, ABPO, European, European or OAPI patent) for the purpose of which the named person is inventor;
 - (d) If in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
 - (e) If in Box No. VI, there are more than three earlier applications where priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI.
2. If the applicant intends to make an indication of the wish that the international application be treated, in certain designated States, as an application for a patent of addition, certificate of addition, inventor's certificate of addition or utility certificate of addition: in such a case, write the name or two-letter code of each designated State concerned and the indication "patent of addition," "certificate of addition," "inventor's certificate of addition" or "utility certificate of addition," the number of the parent application or parent patent or other parent grant and the date of grant of the parent patent or other parent grant or the date of filing of the parent application (Rules 4.11(a)(ii) and 4.11a.1(a) or (b)).
3. If the applicant intends to make an indication of the wish that the international application be treated, in the United States of America, as a continuation or continuation-in-part of the earlier application: in such a case, write "United States of America" or "US" and the indication "continuation" or "continuation-in-part" and the number and the filing date of the parent application (Rules 4.11(a)(iii) and 4.11a.1(a)).

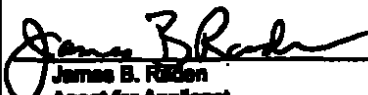
CONTINUATION OF BOX IV:

BAM, Stacy
 BLACKMAN, Marc S.
 CAMPAGNA, Mark V.
 GOLANT, Joseph H.
 RADEN, James B.
 SANDLER, Ronald A.
 SCHWARTZ, Krista S.
 WEISS, Sandra B.
 WITCOFF, David L.
 KELLAM, Matthew D.
 MARLOTT, John A.

All of the above attorneys are members of JONES DAY, 77 West Wacker, Chicago, Illinois 60601-1692, United States of America, as indicated in Box No. IV.

6
109

Box No. V DESIGNATIONS				
The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents. However, ☐ DE Germany is not designated for any kind of national protection ☐ KR Republic of Korea is not designated for any kind of national protection ☐ RU Russian Federation is not designated for any kind of national protection <i>(The check-boxes above may be used to exclude (irrevocably) the designations concerned in order to avoid the causing of the effect, under the national law, of an earlier national application from which priority is claimed. See the Notes to Box No. V as to the consequences of such national law provisions in these and certain other States.)</i>				
Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
Item (1) 10.08.04 (10 August 2004)	60/500208	US		
Item (2)				
Item (3)				
☐ Further priority claims are indicated in the Supplemental Box.				
The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as: ☐ all items ☒ Item (1) ☐ Item (2) ☐ Item (3) ☐ other, see Supplemental Box <i>* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)): . . .</i>				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / US Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year) Number Country (or regional Office)				
Box No. VIII DECLARATIONS				
The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):				Number of declarations
☐ Box No. VIII (i)	Declaration as to the identity of the inventor			:
☐ Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent			:
☐ Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application			:
☐ Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)			:
☐ Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty			:

Box No. IX CHECK LIST, I. JUDGE OF FILING																																																								
This international application contains: (a) In paper form, the following number of sheets: <table border="0"><tr><td>request (including declaration sheets)</td><td>: 5</td></tr><tr><td>description (excluding sequence listing and/or tables related thereto)</td><td>: 17</td></tr><tr><td>claims</td><td>: 11</td></tr><tr><td>abstract</td><td>: 1</td></tr><tr><td>drawings</td><td>: 4</td></tr><tr><td>Sub-total number of sheets</td><td>: 38</td></tr><tr><td>sequence listing</td><td>:</td></tr><tr><td>tables related thereto</td><td>:</td></tr><tr><td colspan="2"><i>(for both, actual number of sheets if filed in paper form, whether or not also filed in computer readable form; see (c) below)</i></td></tr><tr><td>Total number of sheets</td><td>: 38</td></tr></table> (b) ☐ only in computer readable form (Section 801(a)(i)) (i) ☐ sequence listing (ii) ☐ tables related thereto (c) ☐ also in computer readable form (Section 801(a)(ii)) (i) ☐ sequence listing (ii) ☐ tables related thereto Type and number of carriers (diskette, CD-ROM, CD-R or other) on which are contained the: ☐ sequence listing ☐ tables related thereto <i>(additional copies to be indicated under items 9(ii) under 10(ii), in right column)</i>		request (including declaration sheets)	: 5	description (excluding sequence listing and/or tables related thereto)	: 17	claims	: 11	abstract	: 1	drawings	: 4	Sub-total number of sheets	: 38	sequence listing	:	tables related thereto	:	<i>(for both, actual number of sheets if filed in paper form, whether or not also filed in computer readable form; see (c) below)</i>		Total number of sheets	: 38	This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item): <table border="0"><tr><td>1. ☒ fee calculation sheet</td><td>:</td></tr><tr><td>2. ☐ original separate power of attorney</td><td>:</td></tr><tr><td>3. ☐ original general power of attorney</td><td>:</td></tr><tr><td>4. ☒ copy of general power of attorney, reference number, if any:</td><td>:</td></tr><tr><td>5. ☐ statement explaining lack of signature</td><td>:</td></tr><tr><td>6. ☐ priority document(s) identified in Box No. VI as item(s):</td><td>:</td></tr><tr><td>7. ☐ translation of international application into (language):</td><td>:</td></tr><tr><td>8. ☐ separate indications concerning deposited microorganisms or other biological material</td><td>:</td></tr><tr><td>9. ☐ sequence listing in computer readable form (indicate type and number of carriers)</td><td>:</td></tr><tr><td>(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application):</td><td>:</td></tr><tr><td>(ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter</td><td>:</td></tr><tr><td>(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing mentioned in left column</td><td>:</td></tr><tr><td>10. ☐ tables in computer readable form related to sequence listing (indicate type and number of carriers)</td><td>:</td></tr><tr><td>(i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application)</td><td>:</td></tr><tr><td>(ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater)</td><td>:</td></tr><tr><td>(iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column</td><td>:</td></tr><tr><td>11. ☒ other (specify): .Tree-rat</td><td>:</td></tr></table>	1. ☒ fee calculation sheet	:	2. ☐ original separate power of attorney	:	3. ☐ original general power of attorney	:	4. ☒ copy of general power of attorney, reference number, if any:	:	5. ☐ statement explaining lack of signature	:	6. ☐ priority document(s) identified in Box No. VI as item(s):	:	7. ☐ translation of international application into (language):	:	8. ☐ separate indications concerning deposited microorganisms or other biological material	:	9. ☐ sequence listing in computer readable form (indicate type and number of carriers)	:	(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application):	:	(ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter	:	(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing mentioned in left column	:	10. ☐ tables in computer readable form related to sequence listing (indicate type and number of carriers)	:	(i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application)	:	(ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater)	:	(iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column	:	11. ☒ other (specify): .Tree-rat	:
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11. ☒ other (specify): .Tree-rat	:																																																							
Figures of the drawings which should accompany the abstract:	Language of filing of the international application: English																																																							
Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE <i>Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).</i>  James B. Riden Agent for Applicant																																																								

For receiving Office use only	
1. Date of actual receipt of the purported international application:	2. Drawings: ☐ received ☐ not received
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	6. ☐ Transmittal of search copy delayed until search fee is paid

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

PCT. PEDIDO

El que suscribe solicita que esta solicitud internacional siga el proceso de acuerdo con el Tratado de Cooperación sobre Patentes.

Para uso exclusivo de la Oficina receptora

Solicitud Internacional N°

Fecha de Presentación Internacional

Nombre de la Oficina Receptora y "Solicitud Internacional PCT"

Referencia de Archivo del Solicitante o Agente: 090238600036

(Si se desea) (máximo: 12 caracteres)

Casillero N°I: TITULO DE LA INVENCIÓN

DISPOSITIVO DE CONSUME DE ENERGÍA PORTÁTIL

Casillero N°II: SOLICITANTE

[] Esta persona es también inventor

Nombre y domicilio: *(Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)*

POWERPULSE TECHNOLOGIES, L.P.

740 East Campbell Road

Richardson, Texas 75081

Estados Unidos de América 75081

N° telefónico:

N° de fax:

N° de télex: --

Número de inscripción del Solicitante ante la Oficina:

Estado (es decir, país) de nacionalidad: Estados Unidos

Estado (es decir, país) de domicilio: Estados Unidos

Esta persona es solicitante para los propósitos de:

☒ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☐ sólo Estados Unidos de América

☐ los Estados indicados en el casillero complementario

Casillero N°III: OTRO(S) SOLICITANTE(S) Y/U OTRO(S)

INVENTOR(ES):

Nombre y domicilio: *(Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)*

EVANYK, Walter R.

3200 Sherrye Drive

Plano, Texas 75074-4693

Estados Unidos

Esta persona: ☐ sólo solicitante ☐ solicitante e inventor

☒ sólo inventor. *(Si marca este casillero, no complete la información de más abajo)*

Número de inscripción del Solicitante ante la Oficina:--

Estado (es decir, país) de nacionalidad:

Estado (es decir, país) de residencia:

Esta persona es solicitante para los propósitos de:

☐ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☐ sólo Estados Unidos de América

☐ los Estados indicados en el casillero complementario

☐ Se indican otros solicitantes y/o (otros) inventores en una página continuación

Casillero N°IV: AGENTE O REPRESENTANTE; O DOMICILIO PARA CORRESPONDENCIA

La persona identificada a continuación ha sido designada/es designada por la presente para que actúe en nombre del(os) solicitante(s) ante las Autoridades Internacionales competentes, como: ☒ agente ☐ representante

Nombre y domicilio: *(Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y nombre del país)*

RADEN, James B.

JONES DAY

77 West Wacker

Chicago, Illinois 60601-1692

Estados Unidos

N° telefónico: 312-268-4340

N° de fax: 312-782-8585

N° de télex: -----

Número de Inscripción del Agente ante la Oficina: 24.594

☐ Domicilio para Correspondencia: Marque este casillero si no se ha designado ningún agente o representante y si el espacio de precedente ha sido usado en cambio para indicar un domicilio especial al cual ha de enviarse correspondencia.

Formulario PCT/RO/101 (página uno) (enero de 2004)

Ver Notas al formulario de pedido

Página N° 2

Continuación del Casillero N° III. OTROS SOLICITANTES Y/O
(OTROS) INVENTORES

Si no se usa ninguno de los siguientes subcasilleros, esta página no deberá incluirse en el pedido.

Nombre y domicilio: *(Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)*

LONG, Tim

202 Utah Street

Sherman, Texas 75090

Estados Unidos

Esta persona: ☐ sólo solicitante ☐ solicitante e inventor

☒ sólo inventor. (Si marca este casillero, no complete la información de más abajo)

Número de inscripción del Solicitante ante la Oficina:--

Estado (es decir, país) de nacionalidad:

Estado (es decir, país) de residencia:

Esta persona es solicitante para los propósitos de:

☐ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☒ sólo Estados Unidos de América

☐ los Estados indicados en el casillero complementario

Nombre y domicilio: (Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)

Esta persona: ☐ sólo solicitante ☐ solicitante e inventor

☐ sólo inventor. (Si marca este casillero, no complete la información de más abajo)

Número de inscripción del Solicitante ante la Oficina: --

Estado (es decir, país) de nacionalidad:

Estado (es decir, país) de residencia:

Esta persona es solicitante para los propósitos de:

☐ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☐ sólo Estados Unidos de América

13
116

☐ los Estados indicados en el casillero complementario

Nombre y domicilio: (Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)

Esta persona: ☐ sólo solicitante ☐ solicitante e inventor

☐ sólo inventor. (Si marca este casillero, no complete la información de más abajo)

Número de inscripción del Solicitante ante la Oficina:--

Estado (es decir, país) de nacionalidad:

Estado (es decir, país) de residencia:

Esta persona es solicitante para los propósitos de:

☐ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☐ sólo Estados Unidos de América

☐ los Estados indicados en el casillero complementario

Nombre y domicilio: (Apellido seguido del nombre; para empresas, razón social completa. El domicilio debe incluir código postal y país. El país del domicilio indicado en este Casillero es el Estado del solicitante (es decir el país) de residencia si no se indica Estado de residencia abajo)

Esta persona: ☐ sólo solicitante ☐ solicitante e inventor

☐ sólo inventor. (Si marca este casillero, no complete la información de más abajo)

K
117

Número de inscripción del Solicitante ante la Oficina:--

Estado (es decir, país) de nacionalidad:

Estado (es decir, país) de residencia:

Esta persona es solicitante para los propósitos de:

☐ todos los Estados designados ☐ todos los Estados designados salvo Estados Unidos de América ☐ sólo Estados Unidos de América

☐ los Estados indicados en el casillero complementario

☐ Se indican otros solicitantes y/o (otros) inventores en una página continuación

Página N° 3

Casillero Suplementario Si no se usa el Casillero Suplementario, no es necesario incluir esta página en el pedido

1. Si, en alguno de los Casilleros, excepto los Casilleros VIII(i) a (v) para el cual se provee un casillero de continuación especial, el espacio es insuficiente para proporcionar toda la información: en tal caso, escriba "Continuación del Casillero No...." (indique el número del Casillero) y proporcione la información en la misma forma requerida de acuerdo con los subtítulos del Casillero en el cual el espacio fue insuficiente, en particular:

(i) si se debe indicar a más de dos personas como solicitantes y/o inventores y no hay "página continuación": en tal caso, escriba "Continuación del Casillero No. III" e indique para cada persona adicional el mismo tipo de información requerida en el Casillero No. III. El país del domicilio indicado en este Casillero es el Estado del Solicitante (es decir, el país) de residencia si no se indica ningún Estado de residencia abajo;

(ii) si, en el Casillero No. II o en alguno de los sub-casilleros del Casillero No. III, se marca la indicación "los estados indicados en el Casillero Suplementario": en tal caso, escriba "Continuación del Casillero No. II" o "Continuación del Casillero No. III" o "Continuación de los Casilleros No. II y III" (según sea el caso), indique el nombre del solicitante(s) y, a continuación de (cada) nombre, el Estado(s) (y/o, cuando corresponda, patente ARIPO, Eurasia, Europea u OAPI) para cuyos propósitos la persona mencionada es solicitante;

(iii) si, en el Casillero No. II o en alguno de los sub-casilleros del Casillero No. III, el inventor o el inventor/solicitante no es inventor para los propósitos de todos los Estados designados o para los propósitos de Estados Unidos de América: en este caso, escriba "Continuación del

Casillero No. II" o "Continuación del Casillero No. III" o "Continuación de los Casilleros No. II y No. III" (según sea el caso), indique el nombre del inventor(es) y, junto a cada nombre, el Estado(s) (y/o, cuando corresponda, patente ARIPO, Eurasia, Europea u OAPI), para cuyos propósitos la persona mencionada es inventor;

(iv) si, además del agente(s) indicado en el Casillero IV, hay otros agentes: en tal caso, escriba "Continuación del Casillero No. IV" e indique, para cada agente adicional el mismo tipo de información requerida en el Casillero No. IV;

(v) si, en el Casillero No. VI, hay más de tres solicitudes anteriores cuya prioridad se reivindica: en tal caso, escriba "Continuación del Casillero No. VI" e indique para cada solicitud anterior adicional el mismo tipo de información requerida en el Casillero No. VI.

2. Si, el solicitante desea indicar que desea que la solicitud internacional sea tratada, en ciertos estados designados, como una solicitud de patente adicional, certificado de adición, certificado de adición del inventor o certificado de adición de utilidad: en ese caso, escriba el nombre o el código de dos letras de cada Estado designado referido y la indicación "patente adicional" o "certificado de adición" o "certificado de adición del inventor" o "certificado de adición de

utilidad", el número de la solicitud madre o de la patente madre o de otra concesión madre y la fecha de concesión de la patente madre u otra concesión madre o la fecha de presentación de la solicitud madre (Normas 4.11(a)(iii) y 49bis.1(a) o (b)).

3. Si el solicitante desea indicar que desea que la solicitud internacional sea tratada, en Estados Unidos, como una continuación o continuación en parte de una solicitud anterior: en ese caso, escriba "Estados Unidos" o "US" y la indicación "continuación" o "continuación en parte" y el número y la fecha de presentación de la solicitud madre (Normas 4.11(a)(iv) y 49bis.1(d)).

CONTINUACIÓN DEL CASILLERO No. IV:

BAIM, Stacy

BLACKMAN, Marc S.

CAMPAGNA, Mark V.

GOLANT, Joseph H.

RADEN, James B.

SANDLER, Ronald A.

SCHWARTZ, Krista S.

WEISS, Sandra B.

WITCOFF, David L.

KELLAM, Matthew D.

MARLOTT, John A.

121 18

Todos los apoderados precedentes son socios de JONES DAY, 77 West Wacker, Chicago, Illinois 60601-1692, Estados Unidos de América, que se indican en el Casillero N° IV.

Casillero N° V DESIGNACIONES

La presentación de este pedido constituye conforme a la Norma 4.9(a), la designación de todos los Estados Firmantes obligados por el PCT en la fecha de presentación internacional, para la concesión de todos los tipos de protección y, cuando corresponda, para la concesión de patentes tanto regionales como nacionales.

Sin embargo,

[] DE Alemania no se designa para ningún tipo de protección nacional

[] KR República de Corea no se designa para ningún tipo de protección nacional

[] RU Federación Rusa no se designa para ningún tipo de protección nacional

(Los casilleros de verificación precedentes pueden usarse para excluir (irrevocablemente) las designaciones referidas para evitar que deje de estar en vigencia, conforme a la ley nacional, una solicitud de patente nacional anterior de la cual se reivindica prioridad. Véase las Notas al Casillero N°V, en cuanto a las consecuencias de las disposiciones de esa ley nacional en estos y otros Estados).

122

Casillero N°VI REIVINDICACIÓN DE PRIORIDAD

Por la presente se reivindica prioridad de la siguiente solicitud(es) anterior:

Fecha de presentación de la solicitud anterior (día/mes/año)	Número de la solicitud anterior	Cuando la solicitud anterior es:		
		solicitud nacional: país o Miembro de WTO	solicitud regional:* Oficina regional	solicitud internacional: Oficina receptora
item (1) 10-08-04 (10 de agosto de 2004)	60/600208	Estados Unidos		
Item (2)				
item (3)				

[] Se indican otras reivindicaciones de prioridad en el Casillero Complementario

Se solicita a la Oficina receptora que prepare y transmita a la Oficina Internacional una copia autenticada de la solicitud(es) anterior (solamente si la solicitud anterior se presentó ante la Oficina que para los propósitos de la presente solicitud internacional es la Oficina receptora) identificada anteriormente como:

[] todos los items [x] item (1) [] item (2) [] item (3)

123

[] item (4) [] item (5) [] otro, ver Casillero Suplementario

* Cuando la solicitud anterior sea una solicitud ARIPO, es obligatorio indicar en el Casillero Suplementario al menos un país miembro de la Convención de París para la Protección de la Propiedad Industrial para el cual se presentó la solicitud anterior (Norma 4.10(b)(ii)).

Casillero N°VII AUTORIDAD DE BÚSQUEDA INTERNACIONAL

Elección de la Autoridad de Búsqueda Internacional (ISA) (si dos o más Autoridades de Búsqueda Internacional son competentes para realizar la búsqueda internacional, indique la Autoridad elegida; puede usarse un código de dos letras): ISA/US

Pedido de uso de los resultados de una búsqueda anterior; referencia a esa búsqueda (si se ha realizado una búsqueda anterior o si ésta ha sido solicitada a la Autoridad de Búsqueda Internacional):

Fecha (día/mes/año) Número País (u Oficina regional):

Casillero N°VIII DECLARACIONES JURADAS

Las siguientes declaraciones juradas están	Número de
contenidas en los Casilleros VIII(i) a (v)	declaraciones
(marcar los casilleros de verificación	
aplicables siguientes e indicar en la columna	
de la derecha el número de cada tipo de	
declaración):	

124

- ☐ Casillero N°VIII(i) Declaración sobre la
identidad del
inventor
- ☐ Casillero N°VIII(ii) Declaraciones sobre
derecho del
solicitante, a la
fecha de presentación
internacional, de
presentar solicitudes
y que se le conceda
una patente
- ☐ Casillero N°VIII(iii) Declaración sobre el
derecho del
Solicitante, a la
fecha de presentación
internacional, de
reivindicar prioridad
de la solicitud
anterior
- ☐ Caillero N°VIII (iv) Declaración de
carácter de inventor
(solamente para los
propósitos de la
designación de

[] Casillero N°VIII (v)	Declaración	sobre
	revelaciones	no
	perjudiciales	o
	excepciones	a la
	falta de novedad	

Esta solicitud internacional contiene:

pedido (incluyendo 5
páginas de declaración)

(excluyendo la parte

y/o las tablas relacionadas

reivindicaciones	11
-------------------------	-----------

dibujos 4

Subtotal de número de páginas 38

Listado de secuencias

Tablas relacionadas con él

(para ambos, número real de

páginas si se presentan en

126 23

forma de papel, sean o no
 presentadas también en
 forma legible por
 computadora; ver (b) abajo) _____

Número total de páginas 38

(b) ☐ solamente en forma legible por computadora

(Artículo 801(a)(i))

(i) ☐ listado de secuencias

(ii) ☐ tablas relacionadas con él

(c) ☐ también en forma legible por computadora

(Artículo 801(a)(ii))

(i) ☐ listado de secuencias

(ii) ☐ tablas relacionadas con él

Escribir y numerar los portadores (diskette, CD-ROM, CD-R u
 otro) en los cuales están contenidos

☐ listado de secuencias

☐ tablas relacionadas con él

(las copias adicionales deben indicarse en los items 9(ii) y/o
 10(ii), en la columna de la derecha)

Esta solicitud internacional está acompañada	Número de
por el siguiente item(s) (marcar los casilleros	Items
de verificación e indicar en la columna de la	
derecha el número de cada item):	

1. ☒ planilla de cálculo de aranceles

127

2. ☐ poder original por separado

3. ☐ poder general original

4. ☒ copia del poder general;

número de referencia, si hubiera:

5. ☐ declaración de explicación de falta de firma

6. ☐ documento(s) de prioridad identificado(s)

en el Casillero N°VI como item(s): --

7. ☐ traducción de la solicitud internacional

al (idioma):

8. ☐ indicaciones por separado concernientes

a microorganismos u otro material biológico depositado

9. ☐ listado de secuencias de nucleótidos y/o

aminoácidos en forma legible por computadora

(indicar el tipo y número de portadores)

(i) ☐ copia presentada para los propósitos de

la búsqueda internacional conforme a la Norma 13ter

solamente (y no como parte de la solicitud internacional)

(ii) ☐ (solamente cuando se marcó el casillero (b)(i) o

(b)(ii) en la columna de la izquierda) copias adicionales que

incluyen, cuando corresponde, la copia para los propósitos de

la búsqueda internacional conforme a la Norma 13ter.

(iii) ☐ junto con la declaración relevante en cuanto a la

identidad de la copia o copias con la parte de listado de

secuencias mencionada en la columna de la izquierda

128

10. ☐ tablas en forma legible por computadora relacionadas con los listados de secuencias (indicar tipo y número de portadores)

(i) ☐ copia presentada con los propósitos de la búsqueda internacional conforme al Artículo 802(b-cuater) solamente (y no como parte de la solicitud internacional)

(ii) ☐ (solamente cuando se marca el casillero de verificación (b)(ii) o (c)(ii) en la columna de la izquierda) copias adicionales que incluyen, cuando corresponde, la copia para los propósitos de la búsqueda internacional conforme al Artículo 802(b-cuater)

(iii) ☐ junto con la declaración relevante en cuanto la identidad de la copia o copias con las tablas mencionadas en la columna de la izquierda

11. ☒ otros (especifique): Remisión

Figura de los dibujos que deberá acompañar al resumen:

Idioma de presentación de la solicitud internacional: INGLÉS

Casillero N°X FIRMA DEL SOLICITANTE, AGENTE O REPRESENTANTE

Junto a la firma, indique el nombre del firmante y el carácter con el que firma (si el mismo no se deduce de la lectura de la solicitud): [firma ilegible] James B. Raden. Agente del Solicitante

-----Para uso exclusivo de la Oficina Receptora-----

1. Fecha de recepción real de solicitud internacional: ____

2. Dibujos: ☐ recibidos ☐ no recibidos

3. Corrección de fecha de recepción real debido a la recepción posterior pero en plazo de documentos o dibujos que completan la solicitud internacional: ----

4. Fecha de recepción en plazo de las correcciones solicitadas conforme a la Cláusula II(2) del PCT: ---

5. Autoridad de Búsqueda Internacional (si dos o más son competentes): ISA/--

6. ☐ Remisión de copia de búsqueda demorada hasta que se efectúe el pago del arancel de búsqueda

-----Para uso exclusivo de la Oficina Internacional---

Fecha de recepción de la copia del registro por la Oficina Internacional:---

Formulario PCT/RO/101 (última página) (enero de 2004)

Ver notas al formulario de Pedido

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 March 2006 (02.03.2006)

PCT

(10) International Publication Number
WO 2006/022871 A3

(51) International Patent Classification:
A45D 28/12 (2006.01) F26B 7/00 (2006.01)

(21) International Application Number:
PCT/US2005/010788

(22) International Filing Date: 30 March 2005 (30.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60600,208 10 August 2004 (10.08.2004) US

(71) Applicant: POWERPULSE TECHNOLOGIES, L.P.
[US/US]; 740 East Campbell Road, Richardson, TX 75081
(US).

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GH, GI, GM, GR, GU, HT, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MY, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU,
ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(72) Inventors: EVANYK, Walter, R.; 3200 Sherry Drive,
Plano, TX 75074-4693 (US); LONG, Tim; 202 Utah
Street, Sherman, TX 75090 (US).

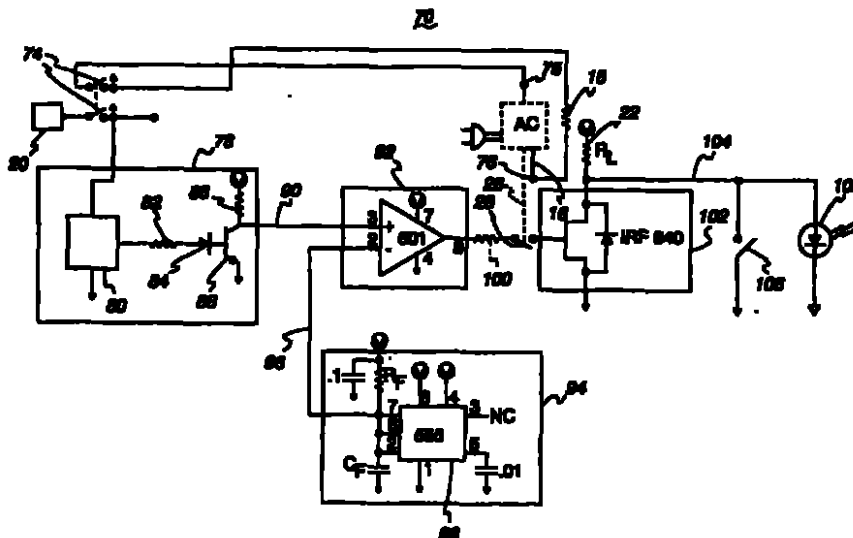
(74) Agents: RADEN, James, B. et al.; Jones Day, 77 West
Wacker, Chicago, IL 60601-1692 (US).

(88) Date of publication of the international search report:
1 February 2007

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: PORTABLE ENERGY CONSUMING DEVICE



(57) Abstract: An improved portable energy consuming device that uses an external power source to store kinetic energy in the device until a desired level is reached and then the external power source is disconnected from the device to form a portable device and an internal power source is automatically used to maintain the desired kinetic energy level. Thus, the external power source causes at least one device load to reach a desired operating level such as temperature and then, when the device is removed from a base on which it is mounted, the external power source is disconnected and an internal power source is automatically connected to the at least one device load to cause it to just maintain the desired operating level. A control circuit is coupled between the internal power source and its associated internal load to cause only sufficient power to be supplied to the load to maintain the desired operating level.

WO 2006/022871 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/10788

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A45D 20/12(2006.01)
F26B 7/00(2006.01)

USPC: 34/380,97

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. : 34/380, 97

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 (names of data base and, where practicable, search terms used)
EAST, PALM

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,155,925 A (CHOI) 20 October 1992, (20.10.1992), column 2 lines 14-55.	1-53
A	US 6,327,438 B1 (LO et al) 04 December 2001 (04.12.2001), column 4 lines 5-65.	1-53
A	US 4,757,183 A (KAREY et al) 12 June 1988 (12.06.1988), column 3 lines 3-66.	1-53

☐ Further documents are listed in the continuation of Box C.

☐ See patent family search.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may have been a priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"T" document published prior to the international filing date but later than the priority date claimed

"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

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is considered with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

18 September 2006 (18.09.2006)

Date of mailing of the international search report

11 DEC 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1458
Alexandria, Virginia 22313-1458

Facsimile No. (571) 273-3201

Authorized officer

Stephen Gravitt

Telephone No. 571 273 3700

132 24

(12) SOLICITUD INTERNACIONAL PUBLICADA DE ACUERDO CON EL
TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES (PCT)

(19) ORGANIZACIÓN MUNDIAL DE LA PROPIEDAD INTELECTUAL

Oficina Internacional

WIPO - OMPI

PCT

(43) Fecha de Publicación Internacional: 2 de marzo de 2006
(2-03-2006)

(10) Publicación Internacional Número: WO 2006/022871 A3

(51) Clasificación Internacional de Patentes⁷: A45D 20/12
(2006.01) F26B 7/00 (2006.01)

(21) Solicitud Internacional Número: PCT/US2005/010788

(22) Fecha de Presentación Internacional: 30 de marzo de 2005
(30-03-2005)

(25) Idioma de Presentación: inglés

(26) Idioma de Publicación: inglés

(30) Datos de la Prioridad:

60/600.208 10 de agosto de 2004 (10-08-2004) Estados Unidos

(71) Solicitante POWERPULSE TECHNOLOGIES, L.P. [Estados Unidos/Estados Unidos], 740 East Campbell Road, Richardson, TX 75081 (Estados Unidos)

(72) Inventores: EVANK, Walter R., 3200 Sherrye Drive, Plano, TX 75074-4693 (Estados Unidos). LONG, Tim, 202 Utah Street, Sherman, TX 75090 (Estados Unidos).

(74) Agentes: RADEN, James B., et al, Jones DAY, 77 West Wacker, Chicago, Illinois 60601 (Estados Unidos).

(81) Estados Designados (excepto que se indique de otro modo para todos los tipos de protecciones nacionales existentes):

AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Estados Designados (salvo que se indique de otro modo, para todos los tipos de protecciones regionales existentes):

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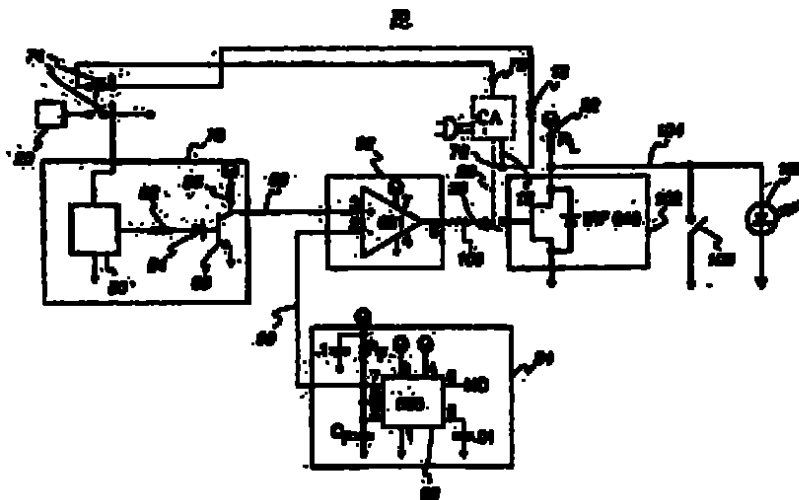
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(54) Título: DISPOSITIVO DE CONSUME DE ENERGÍA PORTÁTIL



(57) Resumen: Un dispositivo de consumo de energía portátil mejorado que usa una fuente de energía externa para almacenar

energía cinética en el dispositivo hasta que se alcance el nivel deseado y luego la fuente de energía externa se desconecta del dispositivo para formar un dispositivo portátil y una fuente de energía interna se usa automáticamente para mantener el nivel de energía cinética deseado. Por lo tanto, la fuente de energía externa hace que por lo menos una carga del dispositivo alcance un nivel de funcionamiento deseado tal como una temperatura y luego, cuando el dispositivo se retira de la base sobre la cual está montado, la fuente de energía externa se desconecta y una fuente de energía interna se conecta automáticamente a por lo menos una carga de dispositivo para hacer que mantenga solamente el nivel de funcionamiento deseado. Un circuito de control se conecta entre la fuente de energía interna y su carga interna asociada para hacer que se suministre solamente la energía suficiente a la carga para mantener el nivel de funcionamiento deseado.

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C. Documentos Considerados Relevantes

Categoría*	Cita de documento, indicando, si corresponde, los pasajes relevantes	Relevante para la reivindicación N°
A	US 5.155.925 A (CHOI) 20 de octubre 1992 (20-10-2992), columna 2, líneas 14-55	1-53
A	US 6.327.428 B1 (LO et al) 4 de diciembre de 2001 (4-12-2001), columna 4, líneas 5-65	1-53
A	US 4.757.183 A (KAREY et al) 12 de junio de 1988 (12-06-1988), columna 3, líneas 3-65	1-53

[] Se mencionan otros documentos en la continuación del Casillero C.

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Número de Fax: (571) 273-3201
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(71) Applicant: POWERPULSE TECHNOLOGIES, L.P.
[US/US]; 740 East Campbell Road, Richardson, TX 75081
(US).

(72) Inventors: EVANYK, Walter, B.; 3200 Sherrys Drive,
Piano, TX 75074-4893 (US); LONG, Tim; 202 Utah
Street, Sherman, TX 75090 (US).

(74) Agents: RADEN, James, B. et al.; Jones Day, 77 West
Wacker, Chicago, IL 60601-1692 (US).

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(54) Title: PORTABLE ENERGY CONSUMING DEVICE

(57) Abstract: An improved portable energy consuming device that uses an external power source to store kinetic energy in the device until a desired level is reached and then the external power source is disconnected from the device to form a portable device and an internal power source is automatically used to maintain the desired kinetic energy level. Thus, the external power source causes at least one device load to reach a desired operating level such as temperature and then, when the device is removed from a base on which it is mounted, the external power source is disconnected and an internal power source is automatically connected to the at least one device load to cause it to just maintain the desired operating level. A control circuit is coupled between the internal power source and its associated internal load to cause only sufficient power to be supplied to the load to maintain the desired operating level.

WO 2006/022871 A2

PORTABLE ENERGY CONSUMING DEVICE

This application claims the benefit of Provisional Application Serial No. 60/600,208, filed August 10, 2004.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates in general to portable energy consuming devices and, in its broadest sense, the novel invention utilizes an external power source to store kinetic energy in a portable energy device and simultaneously store electrical energy in an internal power source in the device only during the storing of the kinetic energy such that when the external power source is separated from the device, the internal power source is used to maintain the stored kinetic energy. In particular, the novel invention relates to improved portable energy consuming devices such as hair management devices and flat clothes iron devices that are brought to a desired operating level, such as temperature, with an external power source and then the external power source is disconnected and an internal power supply, e.g. batteries, maintains only the desired operating level thereby extending the life of the internal power supply as well as the life of the energy consuming device, e.g. heating elements.

2. Description of Related Art

There are many portable energy consuming devices. There are hair management devices such as hair curlers or blow dryers that use batteries to supply the necessary heat.

These devices cause a large current drain on the batteries and shorten the useful span of the batteries. In commonly assigned U.S. Patent No.'s 6,449,870 and 6,718,651, circuits are disclosed for manually controlling a desired set temperature of the energy consuming device. In commonly assigned co-pending provisional patent applications S.N. 60/545,783; and S.N. 60/573,716; and in commonly assigned U.S. Patent No. 6,732,447, circuits are disclosed for automatically providing input power, P_{in} , in an amount equal to the power losses, P_L (e.g. cooling and system losses) of the portable device so that the power output, P_o , is equal to the residual power, P_r , (e.g. kinetic energy such as heat,

142

-2-

mass rotation, and the like). Thus, at a desired operating level, such as a desired temperature, the input power supplied is simply equal to the power losses and the residual power is equal to the output power of the device.

While these devices function well, there is an immense current drain on the batteries to get the portable device to obtain a desired operating level. For instance, where a mass is required to be heated to a particular temperature, it takes a great deal of battery current to heat the mass (such as the metal mass of a hair curling iron) to the desired temperature. By controlling the current drain on the batteries as disclosed in the co-pending provisional patent applications, the remaining life of the batteries can indeed be extended.

However, it would be desirable to use an external power source to cause the mass to reach the desired temperature and then disconnect the external power source and enable the internal power supply, i.e. the batteries, to only maintain the desired temperature of the novel portable energy consuming device. In this novel system, the battery life is extended much further because very little current drain from the batteries is used UNTIL the desired operating level is already reached and the device is then used as a portable device with the internal power source simply maintaining that desired operating level (e.g. temperature). Should the internal power supply fail for any reason, the energy consuming device can be directly connected to the external power supply and used in a conventional manner.

SUMMARY OF THE INVENTION

With the present invention, the energy consuming device (e.g. hair curling iron, soldering guns, hot glue guns, flat clothes irons, mass rotors, and the like) is brought to a desired operating level (e.g. temperature, rotational speed, and the like) by a power source external to the energy consuming device such as an alternating current (ac) source or an external direct current (dc) source. Once the device reaches the desired operating level, the external power source is disconnected from the device and an internal power source automatically begins to supply power to the energy consuming device in an amount only sufficient to maintain the desired operating level. In other words, it supplies just enough

-3-

energy to compensate for power and system losses in the device thereby enabling the residual energy (e.g. temperature, mass rotation, and the like) to be maintained equal to the desired output power.

The external power source may be ac, dc, RF energy, magnetically coupled energy, and the like. Hereafter, for simplicity, the external power source will be identified as simply ac or dc. The energy consuming device, when a temperature controlled device, may have either a single heating element for accepting an external dc power source output for preheating as well as the internal power source (batteries) output to maintain the desired operating level or an ac heating element for connection to an ac external power source to obtain the desired operating level and a dc heating element for connection to the internal power source to maintain the desired operating level.

When both an ac heating element and a dc heating element is used, the resistive heating elements may be of several types such as ribbon type resistances arranged in different relationships such as electrically insulated coils wound together in adjacent interposed relationship with each other or in superimposed, electrically insulated, fashion. The resistive elements may also be of any known type such as wire wound, ceramic, and the like.

A switch may be arranged internally of the energy consuming device that disconnects the internal power source from the load (e.g. resistive heating element) when, and only when, the external power source is connected to the energy consuming device. Thus, when a connector (plug) connects the energy consuming device to the external power source, the connector engages and opens a switch so that the internal power source cannot supply current to the load.

However, when the device reaches the desired operating level and the external power source is disconnected from the device by removing the connector from engagement with the device, the switch in the device is closed thereby enabling the internal power source to maintain the desired operating level with the use of signals that control an electronic switch (such as a power FET) that couples the internal power source to the load.

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144

-4-

When the energy consuming device is a flat clothes iron, it is mounted on a base that has connectors that engage corresponding mating connectors on the flat clothes iron.

Again, either a single dc heating element or both a dc heating element and
5 an ac heating element may be used as the heating element in the flat iron. In either case, the proper power source is coupled to the corresponding connectors on the flat iron to first bring it to the desired operating temperature and then the flat iron is removed from the base and becomes a portable flat iron. The internal power source then maintains the desired operating temperature using the control
10 signals.

If desired, the flat iron may have no heating element for an external power source but would have the internal power source that can be coupled to an internal heating element.

In such case, the flat iron is mounted on a base unit having a flat heating
15 surface that is powered by an external power source. The heat is transferred by conduction, metal to metal, to the flat iron until the flat iron reaches the proper desired operating temperature. Connectors on the base unit again engage corresponding connectors on the flat iron to prevent the internal power supply from supplying power to the heating element until the flat iron is removed from
20 the base unit. The removed connectors then allow an internal switch to close and connect the internal power supply to the internal heating element to only maintain the desired heat.

In such case, it is clear that the internal power supply may consist of the batteries without the novel pulsing circuit disclosed herein. Thus, the unit is
25 heated to the desired temperature with the external power source and then, when the unit is removed from the external power source, the internal power supply, the batteries alone, may be connected to the heating element to maintain the desired heat as long as the batteries last. The internal batteries will not last as long as when the novel pulsing circuit is used to pulse battery power to the load but they
30 will last longer than a portable unit that uses the batteries alone to not only bring the unit to the desired temperature but also to maintain the desired temperature.

145

-5-

It is to be understood that with an internal power source, the power source must be insulated from the heat generated in the device. This can be accomplished in a number of ways. With a hair curling iron, the power supply (e.g. batteries) can be placed in the handle thereof which is on the opposite end of the curling iron from the heating element. The power source may consist of a plurality of series connected battery cells, a stick type battery, or other type power source (hereafter "power source") that can simply be inserted in or removed from the handle as necessary.

With a flat clothes iron, the batteries can again be placed in the handle of the flat iron which is already heat insulated from the ironing surface to enable a user to hold the iron by the handle. Again, the batteries may consist of a plurality of series connected battery cells or a stick type power source assembly that can simply be inserted in or removed from the handle as necessary. The internal power source, as stated earlier, may be charged when the energy consuming device is placed on a base unit.

Thus, it is an object of the present invention to provide a portable energy consuming device that uses an external power source to enable a desired operating level to be achieved and an internal power source to only maintain the desired operating level once the device is disconnected from the external power source to make it portable.

It is another object of the present invention to provide a single dc load in the portable energy consuming device for both bringing the device to the desired operating level with an external dc power source and to maintain the desired operating level with the internal dc power source when the device is disconnected from the external power source and becomes portable.

It is also another object of the present invention to provide a first ac load for bringing the energy consuming device to a desired operating level with an external power source and a second dc load for maintaining the desired operating level with an internal power source when the device is disconnected from the external power source and the device becomes portable.

It is still another object of the present invention to provide a base unit on which the energy consuming device may be placed; the base unit having an

external power source to enable the energy consuming device to be brought to a desired operating level and, optionally, for charging the internal power source in the energy consuming device only during the time that the external power source is supplying power to the energy consuming device.

5 It is yet another object of the present invention to couple a control circuit between the internal power source and the energy consuming load to automatically maintain the desired operating level thereby conserving the internally located power source as well as prolonging the life of the energy consuming load.

10 Thus the present invention relates to a method of creating a portable energy consuming device comprising the steps of forming a body portion with an energy consuming load associated therewith; causing the energy consuming load to achieve a desired operating level using a power source located externally of the body portion; removing externally supplied energy from the energy consuming
15 load when the desired operating level is reached; and only maintaining the desired operating level of the energy consuming load using a power source located internally of the body portion thereby creating a portable energy consuming device.

BRIEF DESCRIPTION OF THE DRAWINGS

20 These and other objects of the present invention will be more fully disclosed when taken in conjunction with the following DETAILED DESCRIPTION OF THE DRAWINGS in which like numerals represent like elements and in which:

25 FIG. 1 is a block diagram illustrating the use of an external power source only to bring an energy consuming device (device) to a desired operating level and then using an internal power source to just maintain the desired operating level and further illustrating the option of using the external power source to charge the internal power source (batteries) during the time that the device is connected to the external power source;

30 FIG. 2 is a block diagram illustrating the external power source connected to a device for bringing the device to a desired operating level while

142

-7-

simultaneously charging the internal batteries of the device and, further, illustrating the mechanical connector that disconnects the internal power source (batteries, in this instance) from the load while the device is coupled to the external power source;

5 FIG. 3 is a block diagram illustrating the energy consuming device in its portable state with a control circuit operating an electronic power switch to provide pulse time modulated power to the load to only maintain the desired operating level of the device.

10 FIG. 4 is a block diagram illustrating a base unit on which a flat clothes iron is placed and illustrating the electrical connections from the external power source to connectors on the base unit for engaging corresponding connectors on the flat clothes iron to both bring the flat clothes iron to a desired temperature (operating level) while simultaneously charging the internal batteries associated with the flat clothes iron;

15 FIG. 5 illustrates a base unit that has an AC/DC converter associated therewith for generating a dc power signal to bring an energy consuming device to a desired operating level while simultaneously generating a dc signal for charging the internal batteries in the energy consuming device;

20 FIG. 6A illustrates an ac resistive heating element and a dc resistive heating element in the form of two flat resistive metal strips wound in interposed, electrically insulated relationship, about a common support;

 FIG. 6B illustrates an ac resistive heating element and a dc resistive heating element in the form of two flat resistive elements placed in superimposed, electrically insulated relationship, for placement in an energy consuming device:

25 FIG. 7 is a schematic diagram illustrating an energy consuming device such as a hair curling iron mounted in a base unit and illustrating the external electrical connections for both preheating the device while simultaneously charging the device internal batteries;

30 FIG. 8 is a schematic diagram of a handle for a flat clothes iron or other energy consuming device illustrating the internal power source, i.e. batteries, in the form of either a plurality of series connected individual cells or a stick-type

battery that can be removed from the handle and replaced with another power source when and if needed;

FIG. 9 is a diagrammatic illustration of a flat clothes iron with the internal power source (batteries) in the handle that connects to a first heating element and a second, separate, heating element for connection to an external power source;

FIG. 10 is a diagrammatic illustration of a flat clothes iron that is heated by conduction from a plate on the base unit that is heated by the external power source and illustrating the connectors on the base that engage a switch in the flat clothes iron to prevent the internal power source from providing power to just maintain the desired operating temperature; and

FIG. 11 illustrates a control circuit shown in commonly assigned co-pending provisional patent application S.N. 60/573,716 that can advantageously be used with the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

It is well known that devices that require significant power to enable them to reach a desired operating level or condition are difficult to make into portable devices because of the size of the batteries or internal power source that are (is) required to just get the device to the desired operating level. By the time the desired operating level is reached, the internal power source (e.g. batteries) is (are) so depleted of energy that there is little internal power source energy remaining to use to just maintain the desired operating level.

If the device could be brought to the desired operating level or condition with the use of an external power source and then the device was made portable by disconnecting the external power supply, an internal power supply could then be used to just maintain the desired operating level. The device would then be truly portable and could be used without the physical interference of an ac cord.

The present invention meets these requirements by using an external power source to store kinetic energy (such as temperature or a rotating mass) in a selected energy consuming device until a desired operating level is reached and then the external power source is disconnected from the device to make the device

-9-

portable. An internal power source is then automatically used to just maintain the kinetic energy at the desired operating level.

Such a device is disclosed in FIG. 1 wherein is shown a block diagram 10 illustrating a generic embodiment of the present invention. As can be seen, an energy consuming device 12 (hereinafter called "device") has an external power source 14 removably coupled to the device 12 by means of conductors 16 to a load element 18 located within the device to cause the device 12 to reach a desired operating level. Then, when the desired operating level is reached, the external power source 14 is disconnected from the device 12, device 12 becomes portable, and an internal power supply 20 is coupled to its own load element 22 to just maintain the desired operating level of the device 12.

The internal power source 20 may, as stated earlier, consist of internal batteries only and, in such case, the external power source 14 brings the device to the proper operating temperature and then it is disconnected and the internal batteries, alone, are connected to the device to maintain the temperature of the device. The batteries or power source 14 will not last as long as when used with the pulsing circuit disclosed herein but will last longer than a device that uses the internal batteries to both heat the device to a desired temperature and then maintain that desired temperature.

Of course, the internal power source 20 may consist of the internal batteries and a pulsing circuit as will shown hereafter to pulse the power of the internal batteries to the load. In such case, the life of the internal batteries is extended even longer as will be disclosed hereafter.

Consider, as an example only, a hair curling iron. The iron has a metal mass serving as the heated surface and it must be raised to a sufficiently high temperature to enable it to be used. This is accomplished in the prior art by the use of alternating current (ac) and it takes several minutes to bring the metal mass to a temperature sufficient for use in curling hair. Then when it is used, the ac cord must remain attached to keep the iron hot.

It is highly desirable to make the curling iron portable and eliminate the physical interference of the ac cord. However, if the curling iron is made portable, no cord is attached and no ac is used. Thus, the internal power source

-10-

must be placed under a severe power drain to bring the device to the desired operating level (in this example, temperature).

Thus, it can be seen with the block diagram of FIG. 1 that if the device 12 is a hair curling iron, it can be heated to the desired operating level or temperature with the external ac power source 14. When the mass of the curling iron reaches the desired operating level, or temperature, the ac cord 16 is disconnected from the hair curling iron 12 in a well know manner as by means, for example, of unplugging ac connectors from the device 12. An internal power source, as will be shown hereafter, is then automatically utilized to just maintain the desired operating level or temperature.

In the generalized embodiment shown in FIG. 1, the external ac power source utilizes and is connected to its own ac heating element located within the device 12.

Once the ac cord is disconnected from the device 12, the internal power source 20 is automatically connected to its own dc heating element 22, as will be explained hereafter, to cause the device 12 to maintain its desired temperature.

Also, as shown in FIG. 1, the external power source 14 may be used to charge the internal power source 20 by means of a second conductor 24, shown as a phantom line, whenever the device 12 is mounted in a base unit as will be shown hereafter.

Of course, the device 12 illustrated generally in FIG. 1 could, in addition to a hair curling iron, represent any hair management device, such as a blow dryer, that requires large amounts of energy to get the device to the proper temperature. Device 12 in FIG. 1 could also represent a flat clothes iron, a soldering gun, a glue gun, a rotating mass, and the like.

Further, when a blow dryer represents the hair management device, the life of the batteries can be further extended by causing the air generated by the blower fan to pass over the batteries and cool them. It is well known that as batteries are used continuously over an extended time period, the internal resistance of the batteries increases. This increased resistance causes the batteries to heat as well as to decrease their external output voltage. If the batteries are then cooled, the output voltage returns to a higher level. Thus, this unique

method of using the blower fan to cool the batteries extends the life of the batteries during a given RUN cycle as well

as extending the entire life of the battery. Such improvement is a valuable asset to the use of portable devices.

5 FIG. 2 is a schematic representation of a device 12 and illustrating a generalized version of the electronics associated therewith. The internal power source 20 in FIG. 2 is coupled, through switch 28, to a dc heating element 22. When the device 12 is to be brought to a desired operating level, such a temperature, an external ac source 14 and connected power cord 16 has on the end
10 thereof an elongated connector 26 of any well-known type in the art that is inserted in a mating receptacle (not shown) in the device 12 in a well-known manner to connect the external power source to an internally located ac load such as heating element 18, for example only, on lines 32 and 34.

At the same time, if desired, the ac input can be connected to an ac/dc
15 converter 30, either internal or external (shown here as internal) that can be used to charge the internal batteries 20 in a conventional manner.

When the ac heating element 18 causes the device 12, here a temperature device, to reach the desired operating level (temperature in this case), the connector 26 is withdrawn from the mating receptacle to make the device
20 portable. When that happens, switch 28 returns to its normally closed position thereby connecting internal power source 20 to its own dc load 22 on line 36. As will be shown hereafter in relation to FIG. 3 and FIG. 11, a control circuit 38 provides just sufficient energy from the internal power source 20 to cause the device 12 to only maintain the desired operating level.

25 The circuit shown schematically in FIG. 3 includes control circuit 38 that is powered by the internal power source 20. When connector 26 (here represented by a phantom line) is disconnected from the device 12, switch 28 closes as explained earlier.

An electronic switch 40, such as a power FET, is opened and closed by the
30 control circuit 38 with the use of Pulse Time Modulated signals to modulate the power signal to load 22 from the internal power source 20. A light emitting diode

152

-12-

(LED) 42 may be utilized, if desired, to let the user know that the control circuit 38 is functioning.

The novel invention works well with any load requiring heavy current to bring it to a desired operating level as explained earlier. FIG. 4 illustrates a flat clothes iron 46 mounted on a base unit 44 shown in cross-section. The flat iron 46 has a handle 47 that is sufficiently temperature insulated from the heated body portion of flat iron 46 to enable a user to pick up and use the heated flat iron 46.

It will be noted in FIG. 4 that an external power source 14 is coupled through cord 16 to a connector that is plugged into the base unit in a well-known manner as explained previously. In this example, external ac power is connected directly to connector 52 by conductor 50 to preheat the iron when a switch on the base (not shown here) is operated by a user when the user desires to use the flat iron. At the same time, if desired, the internal power source can be charged by the output from an ac/dc converter 48 on connector 26. When the iron reaches the desired temperature as may be shown in a well-known manner by an LED 76 shown in FIG. 10, the iron may be removed from base unit 44 and thus becomes a portable iron. It should be noted that while the ac/dc converter 48 is shown to be a part of the base unit 44, it can be external to the base unit 44 if desired. Thus, the flat iron 46 shown in FIG. 4 utilizes first and second heating elements located internally of the flat iron 46. One heating element is an ac heating element (to be used by the external power source) and the other is a dc heating element (to be used by the internal power source).

The flat iron 46 could, if desired, have only one heating element and that is a dc heating element that would be used first during the preheating on the base unit 44 and then, when the flat iron 46 is disconnected from the base unit 44 to make the flat iron portable, the single dc heating element would be connected to the internal power source 20 to just maintain the desired temperature. As shown in FIG. 5, the base unit 44 has an ac/dc converter 48 associated therewith, either internal (as shown) or external to the base unit 44. The device, then, uses the dc power source for preheating a single dc heating element and when the device is disconnected from the base unit 44 to make the device portable, the internal dc source is coupled to the same single dc heating element. Such a connection

-13-

would be obvious to one skilled in the art given the assignment of creating such connection and therefore is neither shown nor explained here.

When two heating elements, an ac and a dc element, are desired to be used, they may be formed in any desired manner. For example, if the device is a hair curling iron, the resistive heating elements may be wound in a circular fashion about a non-electrically conductive cylinder 17 as shown in FIG. 6A. The two resistive elements 18 and 22 are wound about non-electrically conductive cylinder 17 in an interposed, spaced, non-electrical conducting relationship as shown. Of course, one skilled in the art would know how to create other types of arrangements such as a side-by-side relationship.

If the heating elements are of the flat resistive types, one may be superimposed over the other in a non-electrical conducting relationship as shown in FIG. 6B where a flat ac heating element 18 has superimposed thereon and electrically insulated therefrom by insulator 54 a flat dc heating element 22. One skilled in the art would know of other fashions in which the two heating elements 18 and 22 could be advantageously arranged.

FIG. 7 illustrates a base unit 44 on which a hair curling iron 64 (shown in phantom lines) could be mounted for preheating and charging of its internal power supply. The internal power supply may be batteries as is well known in the art. Again, an ac power source, represented by electrical plug 14, is connected by cord 16 to a connector 56 on the base unit 44 as explained earlier. Also as explained earlier, the hair curling iron 64 could have a single heating element for both preheating and portable operation. As shown, however, a first heating element is used for preheating with the external ac power source and a second heating element is used for portable operation with the internal dc power source.

The ac input from the external power source is connected directly to connector 62 on the base unit 44 while the dc power for simultaneously charging the internal power source comes from an ac/dc converter 58 whose dc output is coupled to connector 60.

The power cord 16 terminates at the base unit 44 with a connector 56. Advantageously, connector 56 is identical to the connector 62 on base unit 44. If, for any reason, the portable operation of the device 64 is prohibited, the ac

-14-

connector 56 can be plugged directly into the device 64 where power is normally supplied by connector 62. In such case, the hair curling iron 64 may advantageously continue to be used as a conventional cord attached, non-portable hair curling device.

5 In any use of batteries with a heating device, the batteries must not be subject to heating from the heating elements. In a hair curling iron, the batteries may be placed in a heat insulated handle as is well-known in the art and which is heat insulated from the heating element.

When the novel invention is used with a flat clothes iron, the batteries
10 must be especially protected from the heat maintained by the large metal mass. One such way of heat insulating the batteries is shown in FIG. 8. As shown, the batteries may be separate battery cells 20 or a well known battery "stick" 66 that can be inserted in well known fashion into the handle 47. With battery "stick" 66, the battery is simply slid into and out of the handle to replace it or to charge it
15 externally of the flat clothes iron in a well known fashion. In like manner, the top of the handle 47 could be a hinged plate (not shown) that could be opened and closed in a well known manner to remove and insert batteries. One skilled in the art would understand other methods of mounting, and insulating, the batteries to protect them from the heat.

20 FIG. 9 is a diagrammatic depiction of a portable flat clothes iron 46 having a handle 47 with batteries 20 (internal power source) located therein. The batteries are diagrammatically shown to be connected to a dc load 22 such as a dc heating element while an ac load such as an ac heating element 18 is shown connected to at least one receptacle 50 for receiving power from an external
25 power source while preheating.

FIG. 10 illustrates schematically an alternate embodiment of the invention.

In this embodiment, the flat clothes iron 46 has no internal heating element for preheating. In this embodiment, the base unit 68 has an upper plate 70 that is preheated by the external power source represented by wall plug 14
30 through cord 16. The flat clothes iron 46 simply sits on the heated plate 70 in metal to metal contact to preheat the flat iron 46. When the flat iron 46 is preheated, as may be indicated in a well known fashion by LED 76, it is made

portable by removing it from the base unit upper plate 70. At least one connector 72 has prevented the internal power source 20 from powering the do heating element during preheating. When the flat iron 46 is removed from the base unit 68, the at least one connector 72 is removed from a corresponding receptacle that
5 enables the portable, internal power, operation as explained previously with respect to FIG. 2.

Of course, in all of the embodiments described above, a switch 74 diagrammatically illustrated in FIG. 10 can be used to prevent the device 12 from preheating while it is placed on the base unit.

10 FIG. 11 is a schematic diagram of the electronic control circuit for the novel invention herein that supplies only sufficient Pulse Time Modulated energy to the device to replace only load losses and to maintain the desired power output and thereby conserve battery energy that would otherwise be wasted. This
15 diagram has been explained in detail in co-pending commonly assigned provisional patent application S.N. 60/573,716.

Briefly, however, unit 78 is a detector that senses the desired operating level (e.g. a temperature sensor 80 as shown in Fig. 11). Oscillator 94 generates, in this case, a sawtooth wave output on line 96 that is coupled, along with the amplified detector 78 signal on line 90 to a comparator 92. As long as the
20 amplitude of the amplified output of detector 78 on line 90 is greater than the amplitude of the oscillator 94 output on line 96, there is a constant output from the comparator 92 through resistor 100. This signal is coupled through switch 28 to the gate of power FET 102 causing it to conduct and apply maximum power to the load 22.

25 However, as explained earlier, to save the internal batteries, the device has, in this instance, an ac heating element 18 that is heated to bring the device to the desired operating temperature. As can be seen in Fig. 11, the device is first heated to the desired operating temperature with an external ac power supply 44. The external power supply 44 is coupled to the energy consuming device by
30 means of, in this case, a male connector 26 that makes contact with points 75 and 76 (on line 16) to provide power to the ac load 18 in the device. Switch 74 is a double pole, single throw switch that first couples the external ac source to the ac

156

-16-

load heating element 18. In addition, the other half of switch 74 couples the internal power supply (batteries) to the control circuit described above. Because the control circuit uses such little power, little drain is placed on the internal batteries during the time the external power supply is bringing the device to the desired operating temperature. As explained earlier, the male connector, represented by phantom line 26, physically opens switch 28 thus preventing the FET from receiving any signal from the control circuit of the device. Thus no power is being supplied to the dc load 22 during the time that the external ac power source is heating the device to the desired operating temperature with the use of ac heating element 18. When the ac heating element or load 18 causes the device to reach the desired temperature (which can be indicated in a well known manner by illumination of an LED), the device is removed from its base and the male connector 26 is removed from the device closing switch 28 and allowing the signal from the comparator 92 of the control circuit to be connected to the power FET 102 which begins to apply power to the dc load 22. Because dc load 22 is in physical proximity to the metal mass that has been heated by the external power source 44, the dc load 22 is already heated to the approximate desired operating temperature and the power FET 102 now is Pulse Time Modulated by the control circuit to provide just enough energy to dc load 22 to maintain the desired operating temperature of the device.

An LED 103, if desired, may be coupled across FET 102 and pulses with the pulsing of the FET to indicate to the user that the control circuit is functioning.

Thus, there has been disclosed a novel improved portable energy consuming device that uses an external power source to cause the device to reach a desired operating level and then when the device is removed from its base, the external power source is disconnected from the device and the internal power supply is then automatically connected to a dc load to maintain the desired operating level of the device. A control circuit is coupled between the internal power source and the dc load to Pulse Time Modulate the signal applied thereto to replace only load losses and to just maintain the desired operating level. As explained earlier, the desired operating level is intended to mean a desired

157

-17-

operating temperature, a desired operating rpm, or any other type of load operating condition that has kinetic energy that will maintain the desired operating condition if sufficient energy is provided to just replace the device losses.

- 5 While particular embodiments of the invention have been shown and described in detail, it will be obvious to those skilled in the art that changes and modifications of the present invention, in its various embodiments, may be made without departing from the spirit and scope of the invention. Other elements, steps, methods, and techniques that are insubstantially different from those
- 10 described herein are also within the scope of the invention. Thus, the scope of the invention should not be limited by the particular embodiments described herein but should be defined by the appended claims and equivalents thereof.

- It is to be understood that the term "electronic switch" as used herein is intended to cover suitable switch that can be controlled to intermittently supply
- 15 power to a load including mechanically operated switches such as a relay or a solid state switch such as a Field Effect Transistor (FET) as discussed herein previously.

158

-18-

Claims:

1. **A method of creating a portable energy consuming device comprising the steps of:**
 - forming a body portion with an energy consuming load associated therewith, the load having system power losses;**
 - causing the energy consuming load to achieve a desired operating level using a power source located externally of the body portion;**
 - removing the external power source from the energy consuming load when the desired operating level is reached; and**
 - maintaining the desired operating level of the energy consuming load using a power source located internally of the body portion to offset system power losses thereby creating a portable energy consuming device.**
2. **The method of claim 1 further comprising the steps of:**
 - associating at least one heating element with the body portion as the energy consuming load;**
 - causing the at least one heating element to obtain a desired temperature representing the desired operating level by connecting the externally located power source thereto;**
 - removing the external power source from the at least one heating element when the at least one heating element has reached the desired temperature; and**
 - automatically causing the internally located power source to be connected to the at least one heating element to provide sufficient power to maintain the desired temperature only upon disconnecting the first power source.**
3. **The method of claim 2 further comprising the steps of:**
 - using alternating current (ac) as the externally located power source; and**
 - using batteries (dc) as the internally located power source.**
4. **The method of claim 3 wherein the step of associating at least one heating element with the body portion further comprises the steps of:**

-19-

removably connecting the externally located ac power source to an ac heating element associated with the body portion to cause the ac heating element to heat to the desired temperature; and

automatically associating a dc heating element with the body portion for heating by the internal batteries to provide sufficient power to maintain the desired temperature only when the external ac power source is removed from the ac heating element.

5 5. The method of claim 2 further comprising the steps of:
 using direct current (dc) as the externally located power source;

10 and

 using batteries (dc) as the internally located power source.

6. The method of claim 5 wherein the step of associating at least one heating element with the body portion further comprises the steps of:

 forming a single dc heating element in the body portion;

15 rectifying an external ac power supply output to obtain a dc output that is applied to the single dc heating element to obtain the desired temperature; and

 automatically connecting the internally located batteries to the single dc heating element to provide only sufficient power to maintain the desired temperature only when the single heating element is disconnected from the dc output of the rectified external ac power supply.

20

7. The method of claim 1 further including the steps of:
 placing a normally closed electrical switch between the at least one energy consuming load and the internally located second power source; and

25 automatically opening the electrical switch when the external power source is connected to the at least one energy consuming load to prevent the internally located power source from being connected to the at least one energy consuming load.

8. The method of claim 7 further including the steps of:

30 providing an electrical plug to insert into a receptacle associated with the body portion of the energy consuming device to connect the external power source to the energy consuming load; and

59
161

-21-

using the generated feedback signal to reduce the power input applied to the energy consuming load by the internal power source to an amount sufficient only to replace system losses thereby conserving electrical power by maintaining a desired load operating level with reduced power input.

5 15. The method of claim 14 further comprising the steps of:

coupling an electronic power switch between the energy consuming load and the internal power source; and

turning the electronic power switch ON and OFF with Pulse Time Modulation signals to reduce the power input such that only sufficient power is supplied to the energy consuming load to maintain the desired operating level.

10 16. The method of claim 1 further including the step of using the heating element of a selected one of a hair management device and a flat clothes iron device as the energy consuming load.

15 17. The method of claim 16 further comprising the steps of:

forming a base unit on which to place a selected one of the hair management device and the flat clothes iron device when not being used as a portable device; and

placing at least one electrical connector on the base unit for connecting the external power supply to the heating element to preheat the heating element to a desired operating level prior to the selected one of the devices being used as a portable energy consuming device

20 18. The method of claim 17 further comprising the steps of:

placing additional electrical connectors on and associating additional electronic circuits with the base unit for providing a charging voltage to the internal power source only when the heating element of the selected one of the devices placed on the base unit is receiving power from the external power source.

25 19. The method of claim 12 further comprising the steps of:

forming a base unit on which to place the body portion of the energy consuming device when not being used as a portable device; and inserting at least one of the additional electrical connectors associated with the base unit for insertion in at least one receptacle associated

SA
162

-22-

with the body portion for connecting the external power source to the single dc heating element to preheat the heating element to a desired operating level.

20. The method of claim 4 further comprising the steps of:

5 using a first wound resistance strip in the form of a coil as the ac heating element; and

using a second wound resistance strip in the form of a coil interspaced with, and electrically insulated from, the first wound resistance strip as the dc heating element.

21. The method of claim 4 further comprising the steps of:

10 using a first flat conductor resistance as the ac heating element; and

superimposing a second flat conductor resistance on, and electrically insulated from, the first flat conductor resistance as the dc heating element.

15 22. The method of claim 16 further comprising the steps of:

forming a portion of the selected one of the hair management device and the flat clothes iron device as a handle; and

placing the power source within the handle of the selected device.

23. The method of claim 22 further comprising the step of:

20 inserting a stick type battery within the handle of the selected device as the internal power source.

24. The method of claim 22 further comprising the step of:

inserting a plurality of individual battery cells in series within the handle of the selected device as the internal power source.

25 25. The method of claim 1 further comprising the steps of:

utilizing batteries as the power source located internally of the body portion;

providing a fixture to hold the body portion with the energy consuming device associated therewith;

30 associating at least one first electrical connector with the fixture to couple the external power source to the energy consuming device to cause the energy consuming device to reach the desired operating level; and

60
163

-23-

associating at least one second electrical connector with the fixture to enable an external dc power source to be used to charge the internally located batteries only when the energy consuming device is attached to the fixture such that when the desired operating level of the device is reached, the device can be removed from the fixture thereby disconnecting the external power source from the device and making the device portable by using the internally located batteries.

26. A method of creating a portable temperature generating device comprising the steps of:

10 forming a body portion with a heating element therein;
bringing the heating element to a desired temperature using a first, fixed location power supply;
disconnecting the heating element from the first power supply when the desired temperature is reached to create a portable temperature generating device; and

15 maintaining the desired temperature of the heating element with a second D.C. power supply located within the portable temperature generating device.

27. A method of operating a portable energy consuming device comprising the steps of:

20 storing kinetic energy in the device with the use of a power source located externally of the device;
simultaneously storing electrical energy in a power supply located internally of the device only during the storage of the kinetic energy in the device such that when the external power source is separated from the device, the internal power source provides the energy to maintain the stored kinetic energy; and cooling and extending the life of the internal power supply by blowing external air over the internal power source only when the internal power source is being used to maintain the stored kinetic energy thereby maximizing the amount

25 of energy available from the power supply.

30

28. The method of claim 14 further comprising the steps of:
coupling an electronic switch, comprising either one of a FET and
a relay, between the energy consuming load and the internal power source for
controlling power to the energy consuming load with Pulse Time Modulation
Signals.
29. A portable energy consuming device comprising:
a body portion with an energy consuming load associated
therewith, the load having system power losses;
a power source located externally of the body portion and
removably coupled to the energy consuming load associated with the body
portion for causing the energy consuming load to achieve a desired operating
level; and
a power source located internally of the body portion and coupled
to the energy consuming load only when the energy consuming load has reached
the desired operating level and the external power source is removed therefrom to
offset system power losses and to maintain the desired operating level of the
energy consuming load.
30. The device of claim 29 further comprising:
at least one heating element associated with the body portion as the
energy consuming load for obtaining a desired temperature when removably
connected to the external power source; and
the at least one heating element being automatically connected to
the internal power source only when the external power source is removed from
the device, the internal power source providing sufficient power to maintain the
desired temperature obtained with the external power source.
31. The device of claim 30 wherein:
the external power source is an alternating current (ac) source; and
the internal power source is a direct current (dc) source.

165
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-25-

32. The device of claim 31 wherein the at least one heating element comprises:

an ac heating element removably connected to the external power source for heating the device to the desired temperature; and

5 a dc heating element for automatic connection to the internal power supply maintain the desired temperature of the device only when the external power source is disconnected from the ac heating element.

33. The device of claim 30 wherein:

the external power source is a dc power source; and

10 the internal power source is also a dc power source.

34. The device of claim 33 further comprising:

a single dc heating element in the body portion;

15 an externally located ac power supply having a rectified output to provide a dc output that is applied to the single dc heating element to obtain the desired temperature; and

the internally located dc power supply being automatically connected to the single dc heating element to provide sufficient power to maintain the desired temperature only when the single dc heating element is disconnected from the dc output of the rectified external ac power source.

20 35. The device of claim 29 further comprising:

a normally closed electrical switch placed between and coupling the at least one energy consuming load to the internally located power supply; and

25 a connector associated with the external power source for automatically opening the normally closed electrical switch whenever the external power source is connected to the at least one energy consuming load to prevent the internally located power source from being connected to the at least one energy consuming load.

36. The device of claim 35 wherein the connector comprises:

30 an electrical plug for insertion into a receptacle associated with the body portion of the energy consuming device to connect the external power supply to the at least one energy consuming load; and

63
166

-26-

the electrical plug, when inserted into the receptacle, automatically opening the electrical switch and preventing the internally located power source from being connected to the at least one energy consuming load.

37. The device as in claim 36 further comprising:

5 a dc charging circuit associated with the external power source for automatically charging the internally located power source whenever the external power source is connected to the energy consuming load associated with the device.

38. The device of claim 29 further comprising:

10 a control circuit coupled between the internal power source and the energy consuming load to automatically maintain the desired operating level only when the device is portable thereby conserving the internally located power source as well as prolonging the life of the energy consuming load.

39. The device of claim 38 further comprising:

15 a feedback device for generating a signal representing the instantaneous load operating level; and
the control circuit using the feedback signal to reduce power input applied to the energy consuming load by the internal power source to an amount sufficient only replace system losses thereby conserving electrical power by
20 maintaining a desired load operating level with reduced power input.

40. The device of claim 39 further comprising:

an electronic power switch, formed of one of a FET and a relay,
coupled between the energy consuming load and the internal power source; and
the control circuit turning the electronic power switch ON and
25 OFF with Pulse Time Modulation signals to reduce the power input such that only sufficient power is supplied to the energy consuming load to maintain the desired operating level.

41. The device of claim 29 further comprising:

a selected one of a hair management device and a flat clothes iron
30 device being the energy consuming device; and
a heating element in the selected one of a hair management device and a flat clothes iron device being used as the energy consuming load.

67
167

-27-

42. The device of claim 41 further comprising:

a base unit for receiving the selected one of the hair management device and the flat clothes iron device; and

5 at least one electrical connector on the base unit for connecting the external power source to the heating element to preheat the heating element to a desired operating level prior to the selected one of the devices being used as a portable energy consuming device.

43. The device of claim 42 further comprising:

10 additional electrical connectors and circuits being associated with the base unit for providing a charging voltage to the internal power source only when the heating element of the selected device placed on the base unit is receiving power from the external source

44. The device of claim 37 further comprising:

15 a base unit on which to place the body portion of the energy consuming device when not being used as a portable unit; and the at least one electrical plug forming part of the base unit for insertion in the at least one receptacle associated with the body portion for connecting the external power supply to the single dc heating element to preheat the heating element to a desired operating level.

20 45. The device of claim 32 further comprising:

a first wound resistance strip in the form of a coil as the ac heating element; and

25 a second wound resistance strip in the form of a coil interspaced with and electrically insulated from the first wound resistance strip as the dc heating element.

46. The device of claim 32 further comprising:

a first flat resistance conductor as the as the ac heating element; and

30 a second flat resistance conductor on, and electrically insulated from, the first flat resistance conductor as the dc heating element.

65
168

-28-

47. The device of claim 41 further comprising:
a handle forming a portion of the selected one of the hair
management device and the flat clothes iron device; and
the internal power source being placed in the handle of the device.

5 48. The device of claim 47 wherein the internal power source placed in
the handle of the device comprises:
a stick type battery.

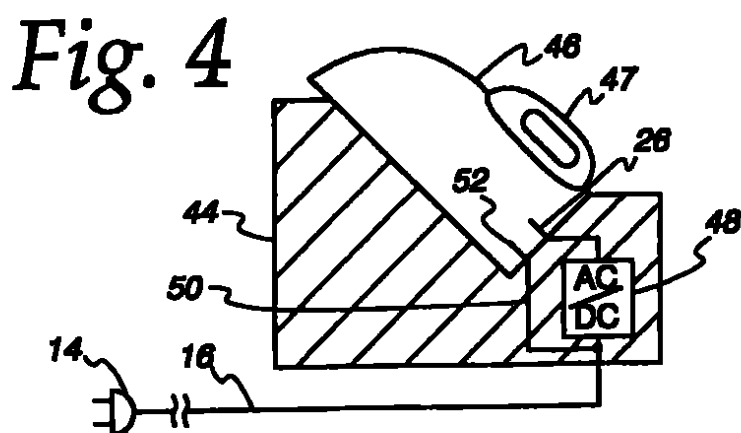
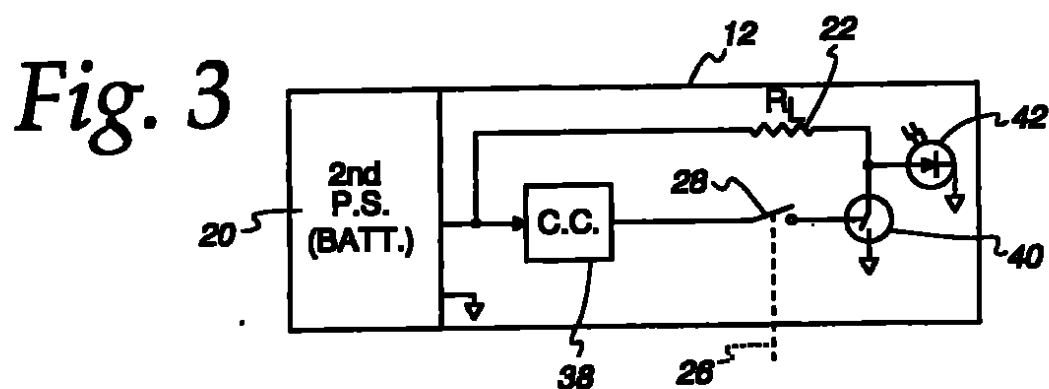
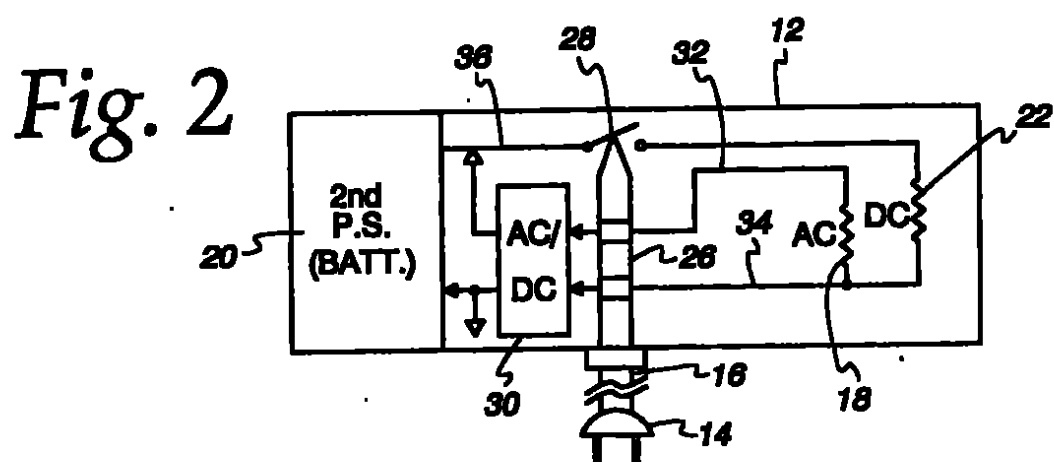
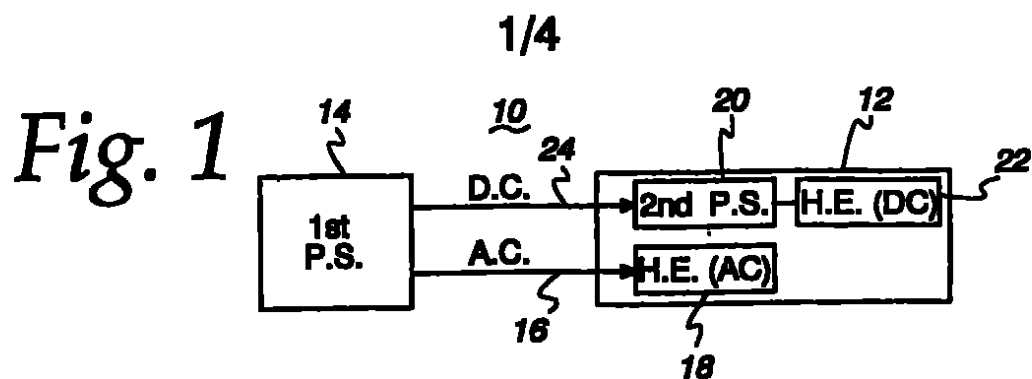
49. The device of claim 47 wherein the internal power source placed in
the handle of the device comprises:
10 a plurality of individual series coupled battery cells.

50. A portable temperature generating device comprising:
a body portion with a heating element therein;
an external power source removably coupled to the body portion
for bringing the heating element to a desired temperature and then being
15 disconnected from the body portion to form a portable device; and
an internal power supply selectively coupled to the heating element
to maintain the desired temperature of the heating element in the portable device.

51. An improved portable energy consuming device comprising:
a power source external to the device for storing kinetic energy in
20 the device at a desired level;
the external power source being disconnected from the device to
make the device a portable device when the stored kinetic energy reaches the
desired level; and
a power source internal to the device for maintaining the desired
25 level of the kinetic energy when the external power source is disconnected
therefrom.

52. The device of claim 51 wherein:
the stored kinetic energy is in the form of temperature.

53. The device of claim 51 wherein:
30 the stored kinetic energy is in the form of mass rotation.



63
170

Fig. 5

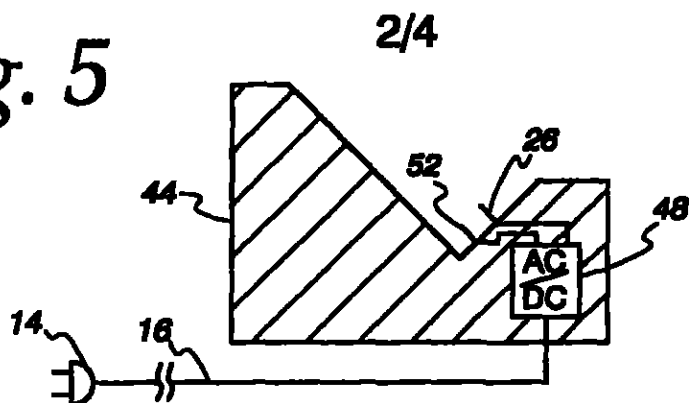


Fig. 6a

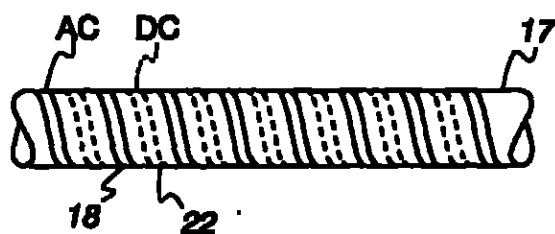


Fig. 6b

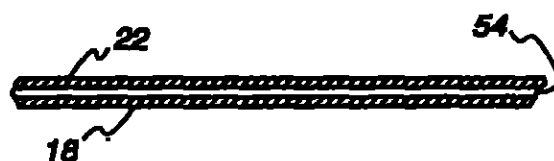
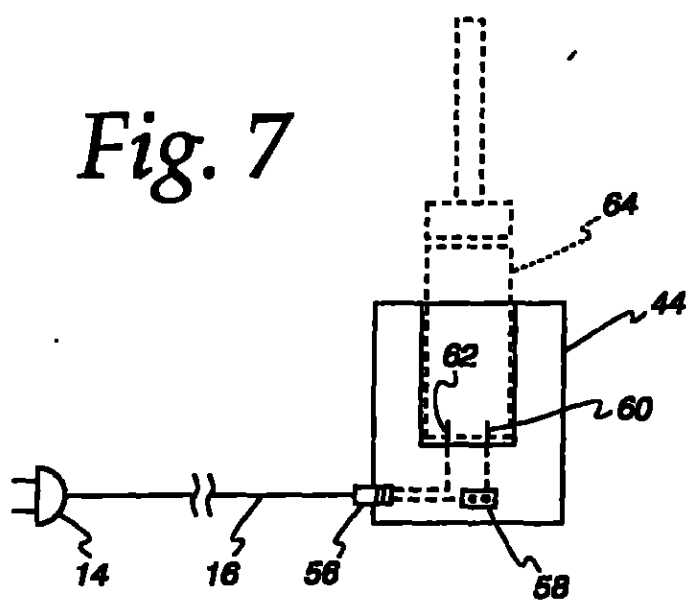


Fig. 7



SA
171

Fig. 8

3/4

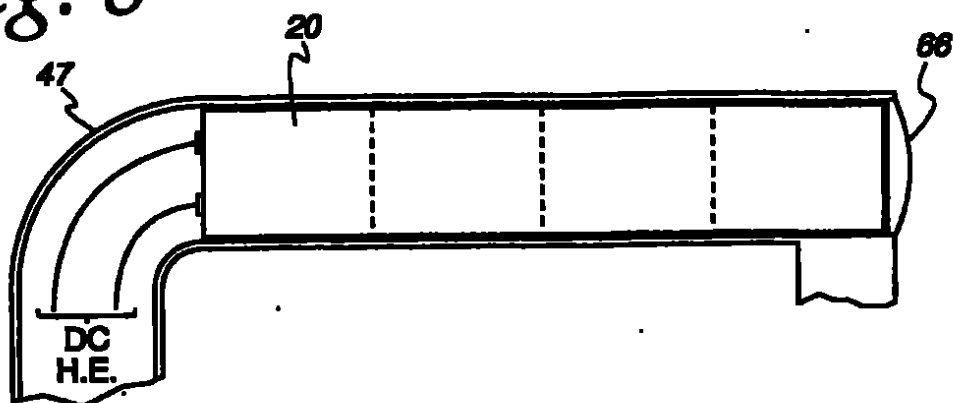


Fig. 9

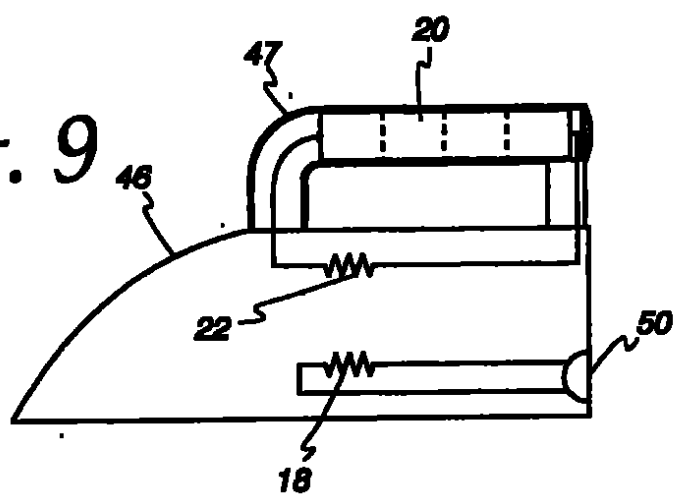


Fig. 10

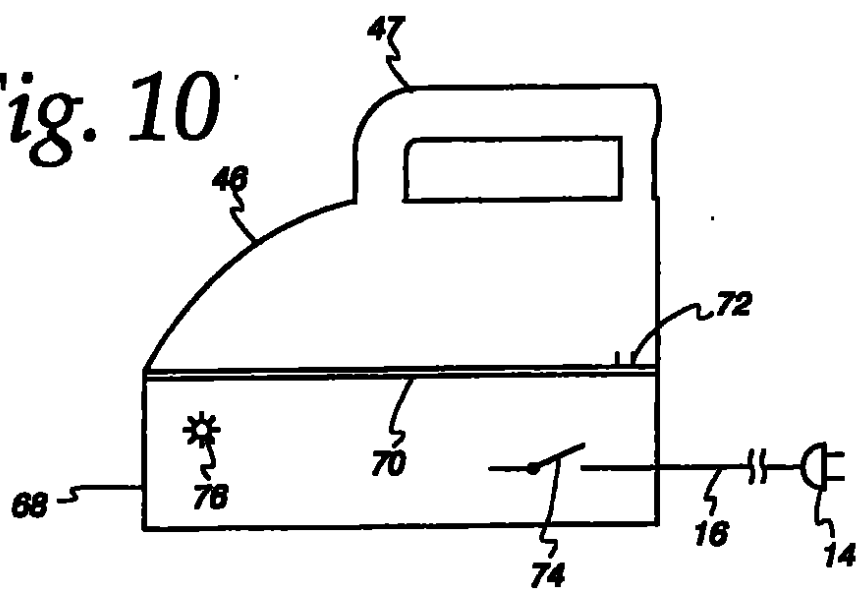


Fig. 11

