

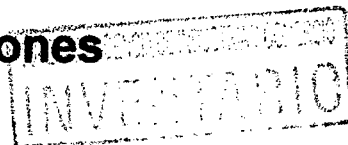


PCT

Industria y Comercio

SUPERINTENDENCIA

Delegatura de Propiedad Industrial
División de Nuevas Creaciones



SOLICITUD

PATENTE DE INVENCION

EXPEDIENTE No.

10^{PCT}-84554

TÍTULO

SISTEMA DE ALTA EFICIENCIA DE BARRAS
COLECTORAS DE FASES ACOPLADAS

SOLICITANTE

ELECTBUS CORPORATION

DOMICILIO

MIAMI (FLORIDA) ESTADOS UNIDOS

APODERADO

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Julio 9 de 2010

*Poder. Cu, Adm. numero de Pdb. Inter.
10-08-2011*



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PETITORIO



SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 10-084554- -00000-0000

Fecha: 2010-07-12 16:12:21 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 379 FASENACIONALI
Act 411 PRESENTACION Folios: 51

FORMULARIO UNICO DE SOLICITUD DE PATENTE PCT ENTRADA EN FASE NACIONAL

①

SOLICITUD DE:



Patente de Invención.



Patente de Modelo de Utilidad



Capitulo I.



Capitulo II

②

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PCT (86)

Solicitud Internacional No. PCT/US09/00131

Fecha 10/01/2009

Publicación Internacional No. WO 2009/089087 A1

Fecha 16/07/2009

⑥

Título (54): SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE
FASES ACOPLADAS

⑦

Clasificación Internacional (51): _____

⑧

Prioridad

SI



NO



(33) País de Origen

(32) Fecha

(31) N° de Solicitud

11

⑨

Comprobante de Pago N°.: _____

Fecha _____

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ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud.
- ☐ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☐ Poderes si fuere el caso.
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones.
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos).
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos).
- ☒ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA)
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- ☐ De ser el caso, certificado de deposito del material biológico.
- ☒ Arte final 12 x 12
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional.
- ☐ Otros.

11) FIGURA CARACTERÍSTICA:

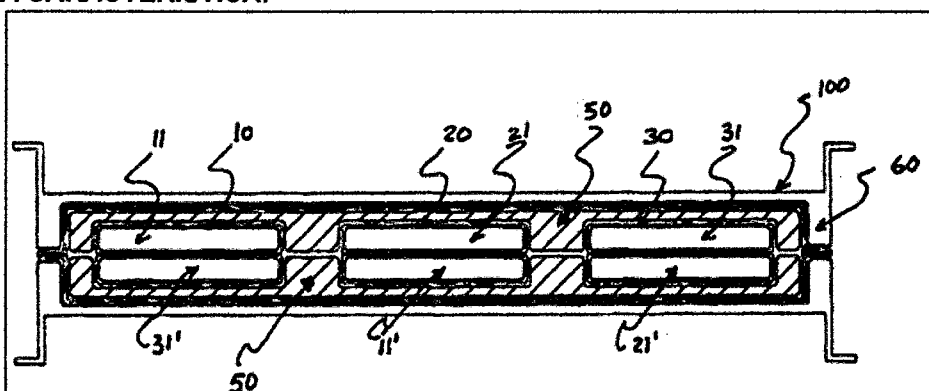


FIG 1

12) Solicito la consecución de la patente,

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T.P. 91835 del

I. TITLE: "HIGH EFFICIENCY PAIRED PHASES BUSWAY SYSTEM"

II. TECHNICAL FIELD

1. Field of the Invention.

The present invention relates to bus ways for electrical distribution systems, and more particularly, to such systems that include three phases and neutral conductor with paired phase arrangement.

III. BACKGROUND ART

2. Other Related Applications.

It has been well established in the art of designing polyphase (mostly three-phase systems) power distribution systems that the use of bus ways with paired phase arrangements for the bus conductors provides significant advantages in conduction efficiency, reduced impedance and balanced voltage drop for unbalanced loads. For a discussion on the paired phase conductor effect, refer to AIEE 54 - 329, Cataldo and Shakman paper, attached, where the theory, tests and result of this technology are explained. It has also been well established, that in the modern design of electrical systems, it is a general requirement to include a neutral conductor insulated from ground and that the last standards require the use of 200% current capacity for the neutral bus in cases where harmonical currents are present.

Several designs for bus way systems have been designed in the past. Electrical systems using the paired phase arrangement were described in detail

in U.S. patent numbers 2,287,502; 2,372,267; and 4,008,365, which propose different approaches to obtain designs of bus way systems using the paired phase arrangement for the conductors. These patents propose different options that improve the efficiency, and balance the impedance between the phases using paired phase arrangement, but none of them, however, discloses the encapsulation of each pair with the neutral bus, nor even consider the unbalanced impedance between the neutral bus and the phases' conductors. This problem is also present in other commonly used bus way designs, different from the ones that use paired phase arrangements, where unbalanced impedance and unbalanced voltage drops between phases and neutral are frequent. In those cases it's required to use transposition elements in order to compensate the unbalanced voltage drop as was disclosed in US patent No. 4,262,163 issued to Durrell, et al. on April 14, 1981 for a Busway Phase Transposition Assembly.

One of the problems is to topologically arrange the pairs and the neutral bus to obtain balanced impedance and balanced voltage drop within phases and neutral conductors in a simple and inexpensive way. As an example of the documentation of the problem, U.S. patent No. 2,955,147 issued to Carlson in 1960 is illustrative. The objective of Carlson's patent was to place derivations of the neutral bus in close proximity to every phase, inserting them between the paired buses. Col. 1, lines 62-65. However, this approach is complicated, not compatible with mass production technologies and thermally inefficient.

Another problem is to topologically arrange the pairs, the neutral bus and the enclosure in a paired phase system to get the maximal thermal efficiency, the small size and high short circuit capacity of the compact (sandwich type) design, where the bus bars, the duct and the electrical insulation are in intimate contact to provide efficient heat transfer from the bus bars to the enclosure by the way of conduction.

The thermally efficient compact design was described originally in the US patent No. 2350601 issued to William Frank in 1954, and improved in the US patents Nos. 3555293, 3571488, 3614297, 3644663, 4758172, 4804804, 4945188 and others, but none of them use the claimed paired phase arrangement in their designs.

Compact (sandwich type) are actually the most common bus way systems used for buildings and general industry, because of their lower cost, compact design and higher short circuit capacity. The paired phase systems are used mostly in particular cases where more efficiency and balanced impedance is required, as in metalwork and automotive industries. Even though the paired phase design provides better technical advantages over the sandwich type, their use is restricted because of their higher cost and non-compact designs.

IV. SUMMARY OF THE INVENTION

It is one of the main objects of the present invention to provide a bus duct for a three phase paired bus way system that maximizes its efficiency by maintaining substantially the same distance to neutral for all phases, in order to get lower and balanced voltage drops along the entire line.

It is another objective of this invention to provide an improved paired phase bus way where the neutral, the phases' conductors, the enclosure and the insulators are in intimate contact to provide efficient heat transfer from the bus bars through the neutral to the enclosure by the way of conduction.

It is another object of this invention to provide an improved paired phase bus way where the neutral conductor or bus bar is arranged in a way that it

compresses the three pairs of phase's buses in order to obtain a volumetrically efficient design and improved capability of withstanding short circuits.

It is yet another object of this invention to provide such a paired phase bus duct design that is inexpensive to manufacture and maintain while retaining its effectiveness.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

V. BRIEF DESCRIPTION OF THE DRAWINGS

With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Figure 1 represents a schematic representation of the paired phase conductors, sandwiched by a neutral bus N, in the flat-wise configuration.

Figure 2A, 2B and 2C correspond to configurations of prior art bus way arrangements.

Figure 2D corresponds to the present invention arrangement with encapsulated pairs of paired phase.

Figure 3 shows an alternate embodiment for encapsulated pairs of phase paired conductors, in the edge-wise configuration.

Figure 4 illustrates yet another embodiment for encapsulated pairs of phase paired conductors, in star configuration.

VI. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, where the present invention is generally referred to with numeral 100, it can be observed that it basically includes three pairs, 10; 20 and 30 of flat bar conductors 11; 11'; 21; 21'; 31 and 31', arrangement in a paired phase configuration, as shown in figure 1, surrounded and encapsulated by two covers acting as electrical neutral conductor 50, and a housing 60 is an enclosure that acts as ground. The distance between neutral conductor 50 and each one of the pairs 10; 20 and 30 is substantially the same. Achieving this provides for the most efficient utilization of the phase paired conductors effect. The phase conductors and the neutral conductor 50 are insulated with conventional film insulation.

Additionally, in the present invention neutral conductor 50 doubles as part of the heat sinking assembly, which also includes the enclosure or housing 60. Also, the encapsulation results in a mechanically stable structure that withstands the stress introduced by short circuits. Another function of neutral conductor 50 is to shield pairs 10; 20 and 30, reducing the magnetic leakage. The inventor has recorded improved paired phase effects.

In one of the preferred embodiments, neutral conductor 50 includes two substantially identical covers that sandwich the pairs 10; 20 and 30. Pair 10 includes, as shown in figures 1 and 2D, conductor 11 from phase R and conductor 31' from phase T'. Pair 20 includes conductor 21 from phase S and conductor 11' from phase R'. Finally, pair 30 includes conductor 31 from

phase T and conductor 21' from phase S'. The letter N designates neutral while the letter G corresponds to ground.

The foregoing description conveys the best understanding of the objectives and advantages of the present invention. Different embodiments may be made of the inventive concept of this invention. It is to be understood that all matter disclosed herein is to be interpreted merely as illustrative, and not in a limiting sense.

VII. INDUSTRIAL APPLICABILITY

It is apparent from the previous paragraphs that an improvement of the type for such a paired phases busway system is quite desirable for distributing electrical energy efficiently.

VIII. CLAIMS

What is claimed is:

1. A three-phase bus duct section comprising:
 - A) first, second and third bus bar pairs; each of said pairs including first and second flat bar conductors kept at a parallel and spaced apart relationship with respect to each other and said first and second flat bar conductors wherein said conductors are connected to achieve paired phase conductor effect, respectively;
 - B) neutral bus bar assembly having cooperative dimensions to encapsulate said first, second, and third pairs without being electrically connected; and
 - C) housing means supporting said neutral bus bar assembly.
2. The bus duct section set forth in claim 1 wherein the separation between said neutral bus bar assembly and said first, second, and third bus bar pairs is substantially the same.
3. The bus duct section set forth in claim 2 wherein said first and second flat bar conductors have opposing facing surfaces separated by an electrical insulator.
4. The bus duct section set forth in claim 3 wherein said housing means is grounded.

5. The bus duct section set forth in claim 4 wherein said neutral bus bar assembly transmits the heat from said flat bar conductors to said housing means so that said heat is dissipated.

6. The bus duct section set forth in claim 5 wherein the encapsulation of said first, second, and third pairs clamps the latter resulting in a mechanically stable structure to withstand the effects of short circuits.

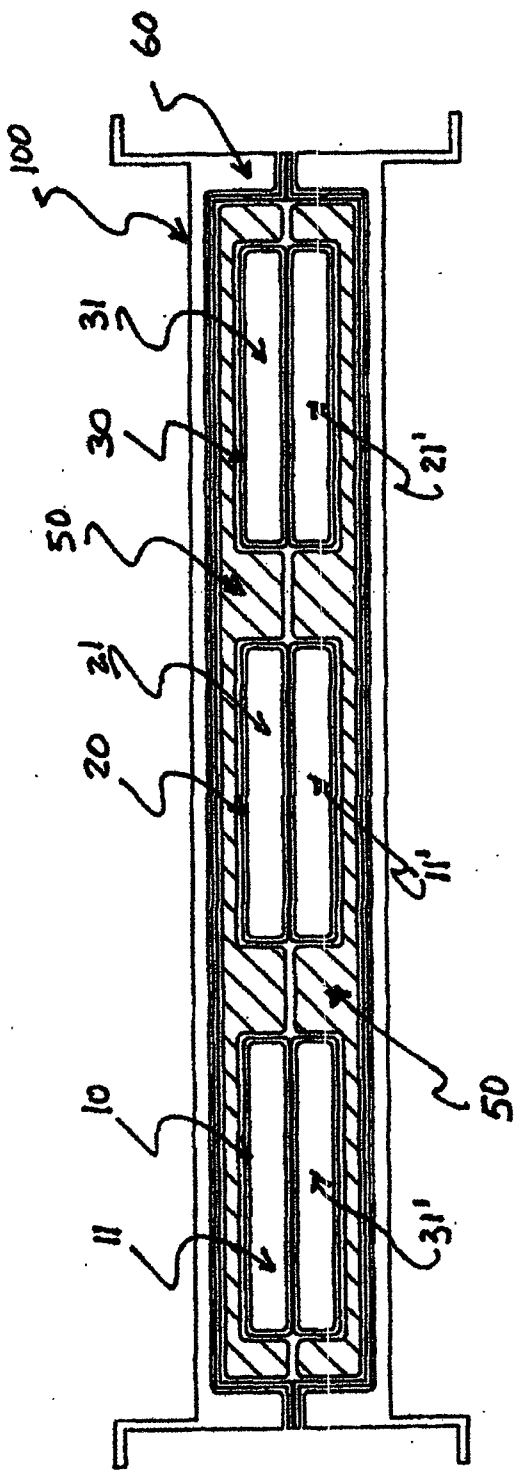


FIG 1

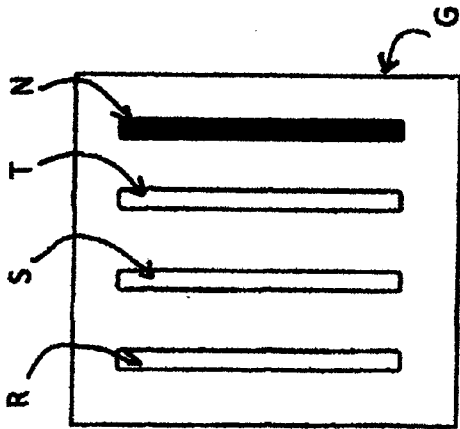


FIG 2A

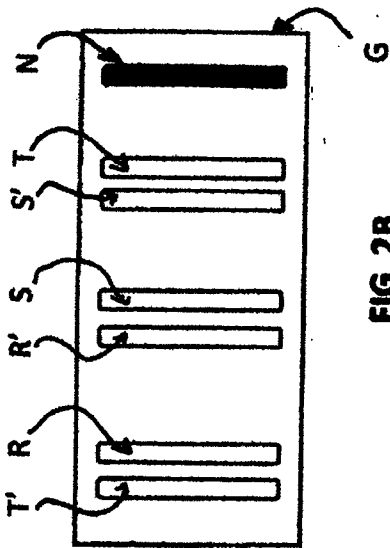


FIG 2B

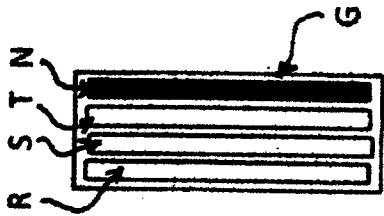


FIG 2C

PRIOR ART

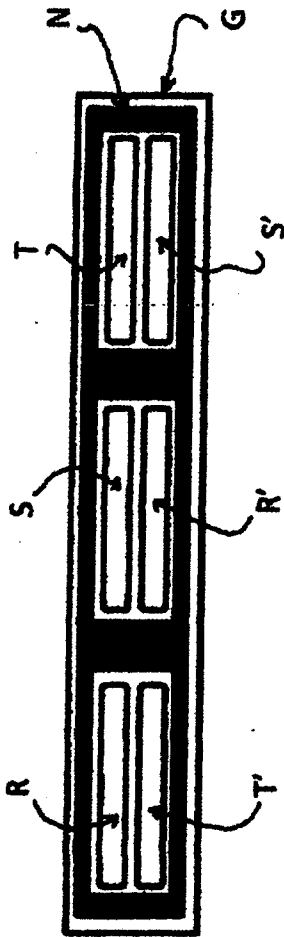


FIG 2D

PRESENT INVENTION

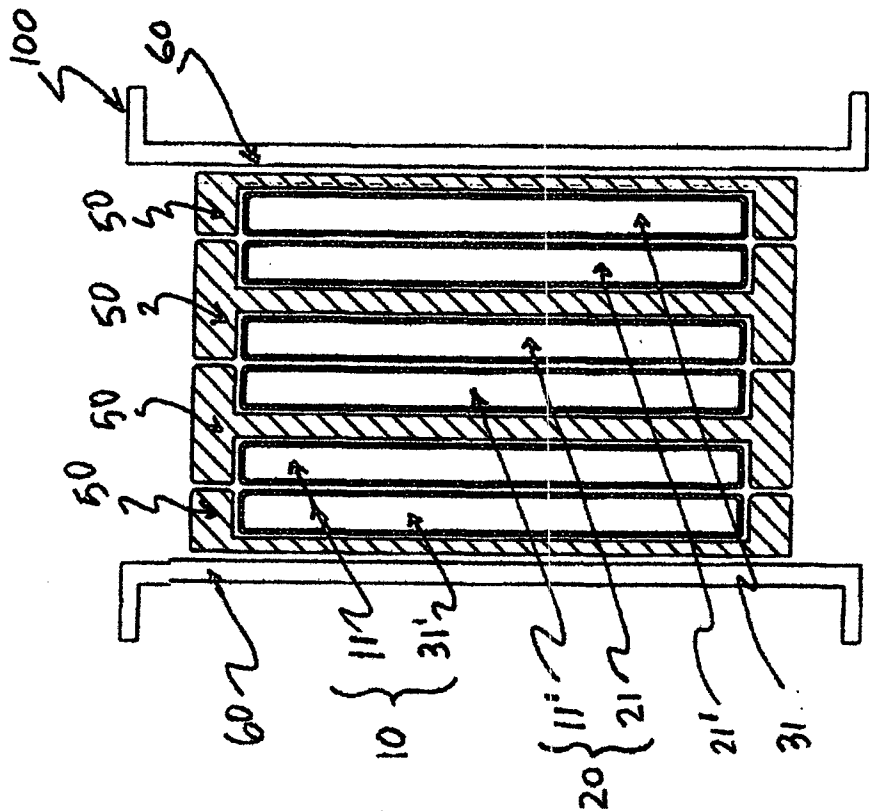
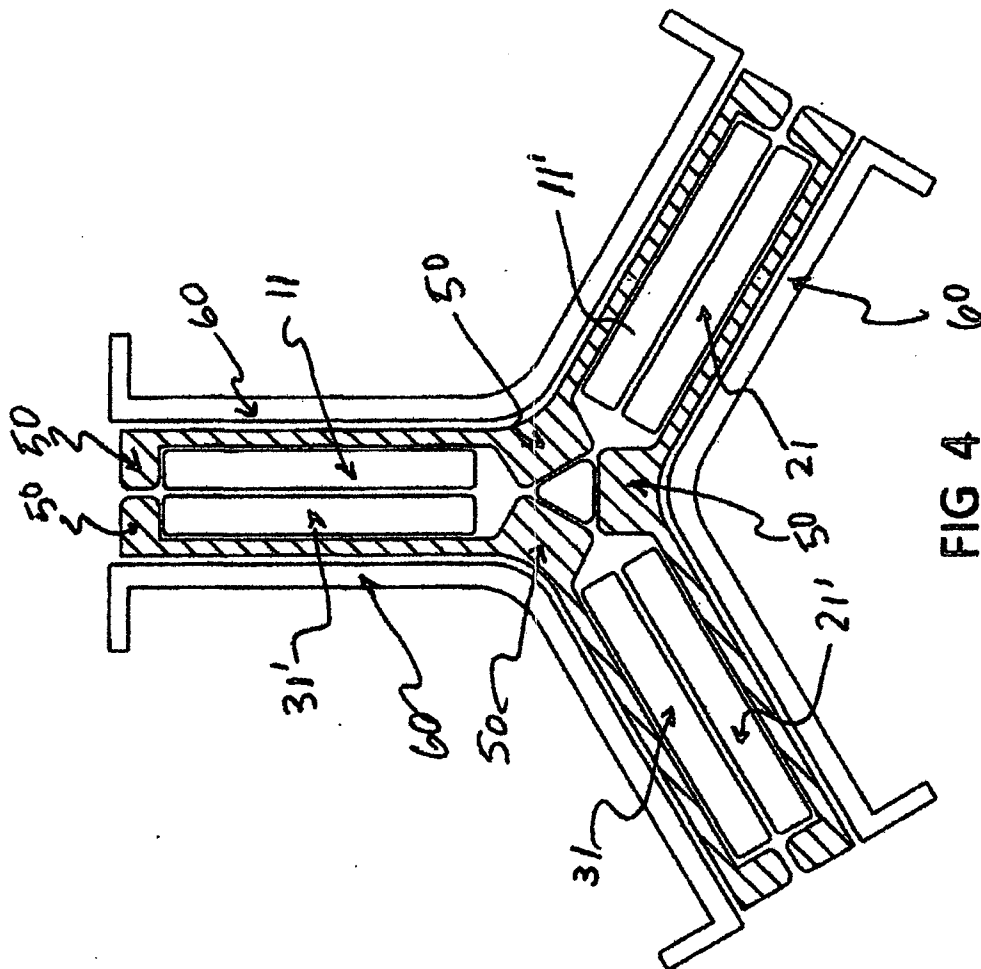


FIG 3



PATENTE DE INVENCION

I. SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE FASES ACOPLADAS

II. CAMPO TECNOLOGICO DE LA INVENCION:

1. Campo de la Invención:

La presente invención se refiere a sistemas de barras colectoras para distribución eléctrica y particularmente a sistemas que incluyen tres fases y conductor neutro con disposición de fases acopladas.

III. ANTECEDENTES:

2. Aplicaciones relacionadas:

Se ha establecido en el campo técnico de diseño de sistemas para distribución de energía polifásica (sistemas de tres fases) que el uso de barras colectoras acopladas para los conductores proveen ventajas evidentes en cuanto a eficiencia de la conducción, impedancia reducida y caídas de voltaje balanceadas para cargas no balanceadas. Para una discusión sobre efecto conductor de fases acopladas podemos referirnos a AIEE – 54-329, Cataldo y Shakman conjuntamente, donde el ensayo y la teoría y resultados de esta tecnología están explicados. También se ha establecido, que en el diseño moderno de sistemas eléctricos es requisito general incluir un conductor neutro aislado desde tierra y que los últimos estándares requieren el uso de un 200% de capacidad de corriente para la barra neutra en casos donde se presentan corrientes armónicas.

En el pasado se diseñaron varios modelos para sistemas de barras colectoras.

Los sistemas eléctricos que utilizan la disposición de fase acoplada se describen en detalle en la patente U. S. 2.287.502; 2.372.267; y 4.008.365 las cuales proponen diferentes intentos para obtener diseños de sistemas de barras colectoras con fase acoplada para los conductores. Esas patentes ofrecen diferentes opciones que mejoran la eficiencia y equilibran la impedancia entre las fases utilizando disposición de fases acopladas, pero ninguna de ellas describe la encapsulación de cada par con la barra neutra como tampoco consideran la impedancia no balanceada entre la barra neutra y las fases de los conductores acoplados.

Este problema se presenta igualmente en otros diseños comúnmente utilizados en barras colectoras, diferentes de los que utilizan disposición de fase acoplada, donde la impedancia no balanceada así como las caídas de voltaje entre las fase y la barra neutra son frecuentes. En estos casos se requiere usar transposición de elementos para compensar la caída de voltaje no balanceada tal como se describe en la patente U. S. 4.262.163 otorgada a Durrell, et al., en abril 14 de 1.981 para un ensamble de transposición de fases en barras colectoras.

Uno de los problemas es disponer topológicamente los acoples y la barra neutro para obtener una impedancia balanceada y una caída de voltaje balanceado en las fases y los conductores neutros de un modo simple y económico. Como un ejemplo documental del problema, la patente U. S. 2.955.147 otorgada a Carlson en 1.960 es ilustrativa. El objetivo de la patente de Carlson era colocar derivaciones de la barra neutro en estrecha proximidad a cada fase, insertando entre ellas las barras acopladas. Col. 1

líneas 62 65. Por otra parte este intento es complicado, no compatible con tecnologías de producción y térmicamente ineficiente.

Otro problema es disponer topológicamente los pares o acoples, del colector neutro y su cubierta en un sistema de fase acoplada para buscar la máxima eficiencia térmica, tamaño pequeño y alta capacidad en cortos circuitos de la modalidad compacto (tipo sánduche), donde las barras colectoras del ducto y el aislamiento eléctrico están en íntimo contacto lo cual provee una eficiente transferencia de calor desde las barras a la cubierta por medio de la conducción.

El diseño compacto con eficiencia térmica se describió inicialmente en la patente U. S. 2.350.601 otorgada a William Frank en 1.954 y mejorada por las patentes U. S. 3.555.293, 3.571.488, 3.614.297, 3.644.663, 4.758.172, 4.804.804, 4.945.188 y otras, pero ninguna de las cuales utiliza en su diseños el arreglo o disposición de fases acopladas.

El compacto (tipo sánduche) es actualmente uno de los sistemas para barras colectoras comúnmente utilizados para las construcciones y la industria en general, dado su bajo costo su diseño compacto y su alta capacidad en cortos circuitos. Los sistemas de bases acopladas se utilizan principalmente en casos especiales donde se requiere más eficiencia y balance en la impedancia, tales como la industria metalmecánica y la industria automotriz. Con todo el diseño de fases acopladas provee mejores ventajas técnicas sobre el diseño tipo sánduche, y su uso se ha restringido dado su alto costo y diseño no compactos.

IV. RESUMEN DE LA INVENCION:

Uno de los principales objetos de la invención es proveer un ducto o canalización para barras acopladas en tres fases, sistema que maximiza su eficiencia por mantener sustancialmente la misma distancia con la barra neutra en todas las fases a fin de reducir y balancear las caídas de voltaje a lo largo de toda la línea.

Otro objetivo de la invención es proveer unas barras colectoras de fase acoplada donde la barra neutra los conductores de fase, la cubierta y el aislamiento van en un estrecho contacto para proveer una eficiente transferencia de calor desde las barras a través de la barra neutra a la cubierta por vía de conducción.

Otro objetivo es proveer unas barras colectoras de fase acoplada, donde la barra neutra colectora se dispone de modo que comprima las tres barras de fase acoplada en orden a obtener un diseño volúmetricamente eficiente y una capacidad mejorada de resistir corto circuitos.

Otro objetivo de la invención es proveer un diseño de ducto para las barras colectoras económico en su manufactura y mantenimiento que puede mantener su efectividad.

Objetivos adicionales al invento se harán evidentes dentro de la descripción sin limitaciones en las mismas.

V. DESCRIPCION DE LAS FIGURAS:

Con base en los objetivos anteriores, la invención consiste en detalles de construcción y combinación de partes que se entenderán a partir de la siguiente descripción y en conjunto con las siguientes figura en las cuales:

La figura 1 presenta una vista esquemática de los conductores de fase acoplada coligados por una barra neutral N dentro de una vista alargada.

Las figuras 2A , 2B y 2C corresponden a configuraciones de barras colectoras en la técnica anterior.

La figura 2D corresponde a la disposición objeto de la presente invención con acoples encapsulas de fase acoplada.

La figura 3 muestra una forma alterna para acoples encapsulados de conductores de fase acoplada en configuración extrema.

La figura 4 ilustra otra alternativa para acoples encapsulados de conductores de fase acoplada en configuración estrella.

VI. DESCRIPCION DETALLADA DE LA INVENCION:

Refiriéndonos a la figura 1 que representa a la invención con (100) puede observarse que incluye básicamente tres pares o acoples (10) (20) y (30) o conductores de barra plana (11) (11') (21) (21') (31) y (31') dispuestos en una configuración de fases acopladas rodeados y encapsulados por dos cubiertas que actúan como un conductor eléctrico neutro (50) y una carcaza (60) que actúa a su vez como masa a tierra. La distancia entre el conductor (50) y cada uno de los acoples (10) (20) y (30) es la misma a fin de proveer la mas eficiente utilización y efecto de estos conductores de

fases acopladas. Los conductores de fase y el conductor neutro (50) van aislados con aislante convencional en película.

Adicionalmente en el presente invento el conductor (50) actúa como un ensamble amortiguador de calor, que también incluye a la carcaza (60). Igualmente la encapsulación origina una estructura mecánicamente estable que reduce los esfuerzos originados por los cortos circuitos. Otra función del conductor (50) es blindar los pares (10) (20) y (30) reduciendo la dispersión magnética, efectos mejorados registrados por el inventor.

En una de las alternativas preferidas, el conductor (50) incluye dos cubiertas sustancialmente idénticas que comprimen los pares (10) (20) y (30). El par o acople (10) que incluye como se ve en las figuras 1 y 2D, un conductor (11) desde la fase R y un conductor (31') desde la fase T'. El acople o par (20) incluye un conductor (21) desde la fase S y un conductor (11') desde la fase R'. Finalmente el acople o par (30) un conductor (31) desde la fase T y un conductor (21') desde la fase S'. La letra N designa neutro o neutral mientras la letra G designa masa o a tierra.

La presente descripción conduce a mejor entendimiento de los objetivos y ventajas de la presente invención. Diferentes incorporaciones pueden hacerse dentro de la misma, y deben entenderse que lo aquí descrito o mencionado debe interpretarse simplemente a título ilustrativo y no a título limitativo.

VII. APLICACIÓN INDUSTRIAL:

Es evidente por lo previamente mencionado que un mejoramiento del tipo de sistemas de barras colectoras con fase acoplada es muy deseable para una distribución eficiente de la energía eléctrica.

VIII. REIVINDICACIONES

1. Una sección de ducto para barras colectoras de tres fases que comprende:
 - A) un primero un segundo y un tercero acople o pares de barras colectoras; cada uno de ellas incluyendo primero y segundo conductores planos paralela y espaciadamente colocados entre sí y donde dichos primeros y segundos planos van conectados para obtener un efecto conductor de fases acopladas respectivamente;
 - B) un ensamble de barra neutro que tiene dimensiones cooperantes para encapsular dicho primero segundo y tercer acople o pares sin estar eléctricamente conectados; y
 - C) medios de cubierta o carcaza que soportan dicho ensamble de barra neutra.
2. Una sección de ducto conforme a la reivindicación 1 donde la separación entre dicha barra neutra y dicho primero segundo y tercer acople de par de barras es sustancialmente la misma.
3. Una sección de ducto según la reivindicación 2 donde dicho primero y segundo conductor plano tienen superficies opuestas separadas por un aislante eléctrico.
4. Una sección de ducto conforme a la reivindicación 3 donde dicha carcaza o cubierta está puesta a tierra.

5. Una sección de ducto conforme a la reivindicación 4 donde dicho ensamble de barra neutro transmite el calor desde los conductores planos hacia dichos medios de carcaza o cubierta para disipar el calor.
6. Una sección de ducto conforme a la reivindicación 5 donde el encapsulamiento de dicho primero segundo y tercer para o acoples se caracteriza por una estructura mecánicamente estable para contrarrestar los efectos de corto circuitos.

RESUMEN

Un sistema de barras colectoras de fases acopladas para distribución de energía eléctrica donde los tres pares o acoples de conductores están rodeados y encapsulados por un conductor neutro y empacados entre sí con la carcasa a manera de un elemento compacto para obtener igual separación entre la barra neutra y los conductores de fase acopladas. El ensamble de la barra o conductor neutro consiste de dos cubiertas que aprisionan los tres pares de conductores de fase y las capas aislantes a fin de obtener una mínima e igual distancia entre ellos y reducir y balancear la impedancia entre la barra neutra y los conductores acoplados. La carcasa comprime cada par a través del conductor neutro y la capa aislante para mantener un contacto entre los conductores, la barra neutra y la carcasa con miras a una eficiente disipación del calor al exterior.

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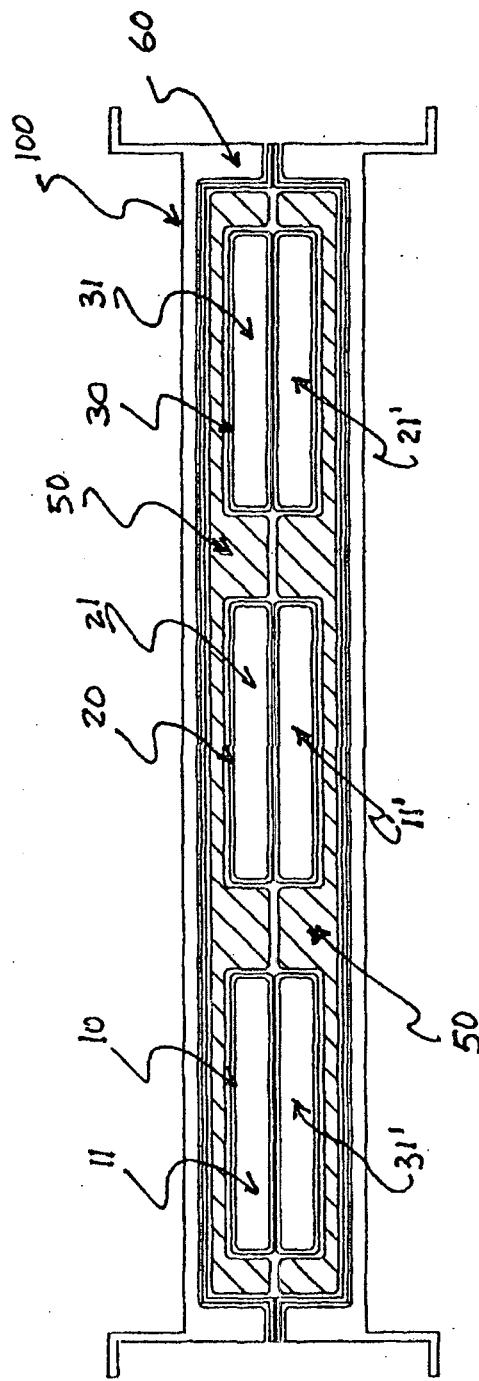


FIG 1

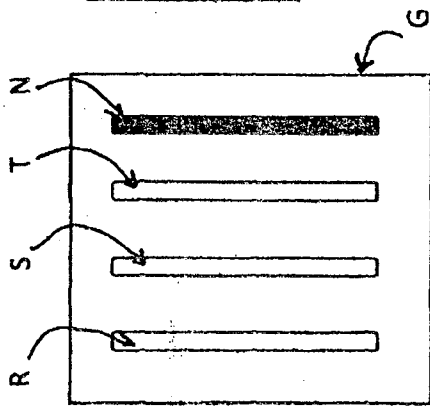


FIG 2A

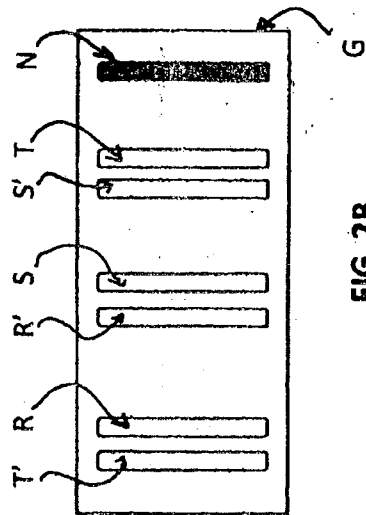


FIG 2B

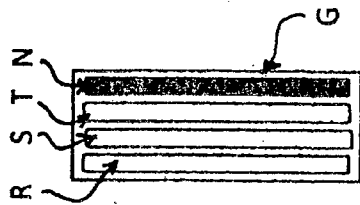


FIG 2C

TECNICA
ANTERIOR

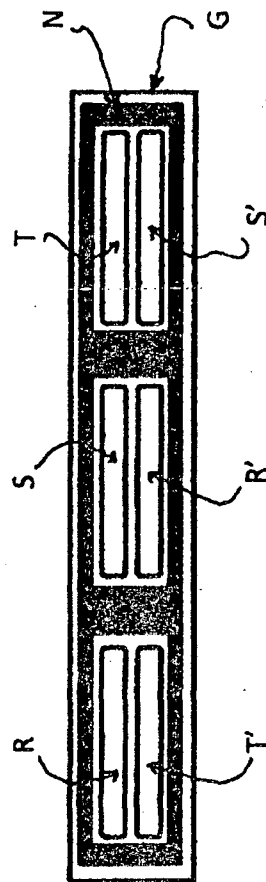


FIG 2D

INVENCION
PRESENTE

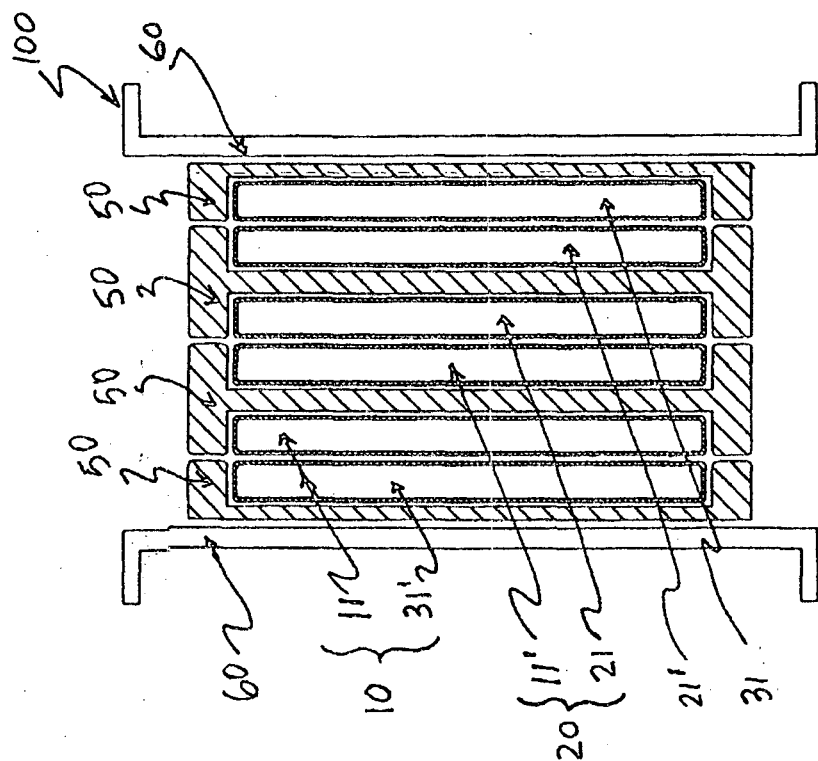
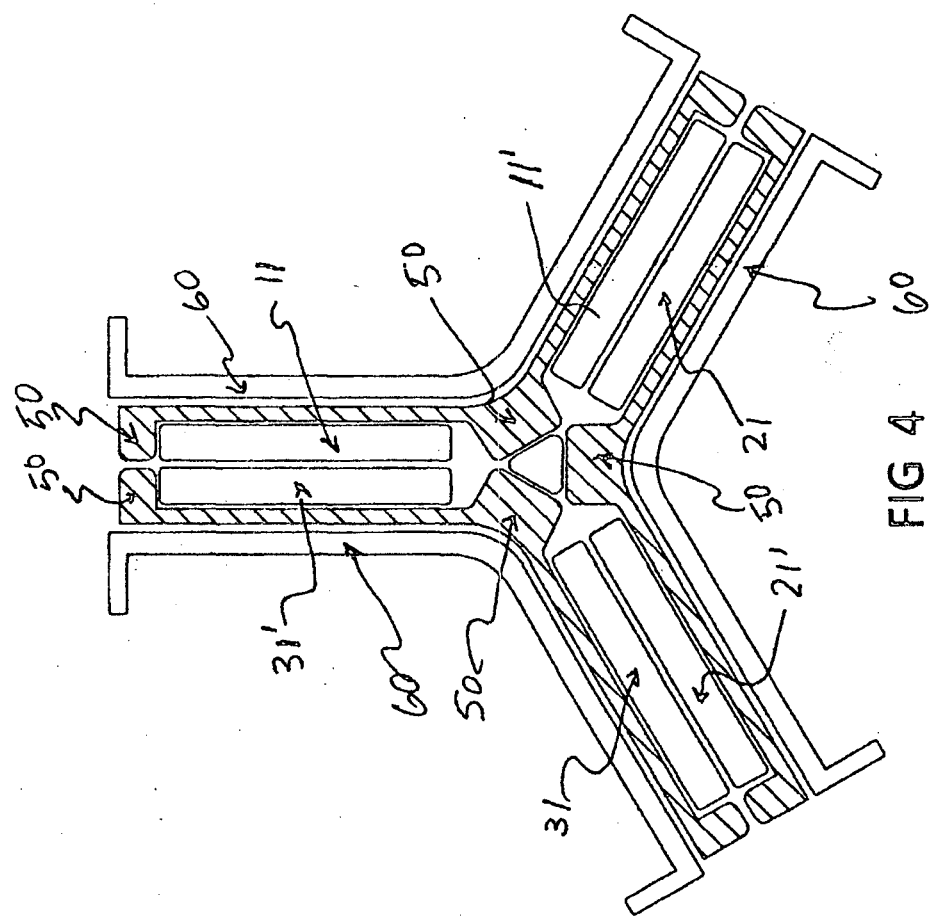


FIG 3



PATENT COOPERATION TREATY
PCT
INTERNATIONAL SEARCH REPORT
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 280367	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 09/00131	International filing date (day/month/year) 10 January 2009 (10.01.2009)	(Earliest) Priority Date (day/month/year) 10 January 2008 (10.01.2008)
Applicant ELECTBUS CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

OK ☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,

OK ☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

OK ☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. 1

OK ☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/00131

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01B 11/02 (2009.01)

USPC - 174/27

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)

USPC - 174/27

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 174/24, 27, 68.2, 99B, 117FF, 117AS, 658 (keyword limited, see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(PGPB,USPT,EPAB,JPAB); Google. Search Terms Used: heat, short circuit, clamp, housing, ground, 3 phase, insulate, encapsulate, bus, neutral, enclose, envelope, contain, surround, paired phase, power, distribution, electrical, transmission, three pairs

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1096632 A1 (Burguera) 02 May 2001 (02.05.2001) entire document, especially: Fig. 2B, Fig. 5, para. [0011], [0022], [0023]	1-6
Y	US 5,854,445 A (Graham et al.) 29 December 1998 (29.12.1998) Fig. 3A, col. 3, ln 47-49, 59-64, col. 5, ln 4-22	1-6
A	US 4,945,188 A (Jackson) 31 July 1990 (31.07.1990) entire document	1-6
A	US 4,112,249 A (Carlson) 05 September 1978 (05.09.1978) entire document	1-6

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

* 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 but published on or after the international filing date

"L" document which may throw doubts on 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

"P" 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 combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

16 February 2009 (16.02.2009)

Date of mailing of the international search report

24 FEB 2009

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT QSP: 571-272-7774

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
16 July 2009 (16.07.2009)

PCT

(10) International Publication Number
WO 2009/089047 A1

- (51) International Patent Classification:
H01B 11/02 (2006.01)

(21) International Application Number:
PCT/US2009/000131

(22) International Filing Date: 10 January 2009 (10.01.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/972,256 10 January 2008 (10.01.2008) US

(71) Applicant (for all designated States except US): ELECT-BUS CORPORATION [US/US]; 2111 N.W. 79 Avenue, Miami, FL 33122 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): BURGUERA, Elio [US/US]; 2111 N.W. 79 Avenue, Miami, FL 33122 (US).

(74) Agent: SANCHELIMA, Jesus; 235 S.W. Le Jeune Road, Miami, FL 33134 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, 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

(54) Title: HIGH EFFICIENCY PAIRED PHASES BUSWAY SYSTEM

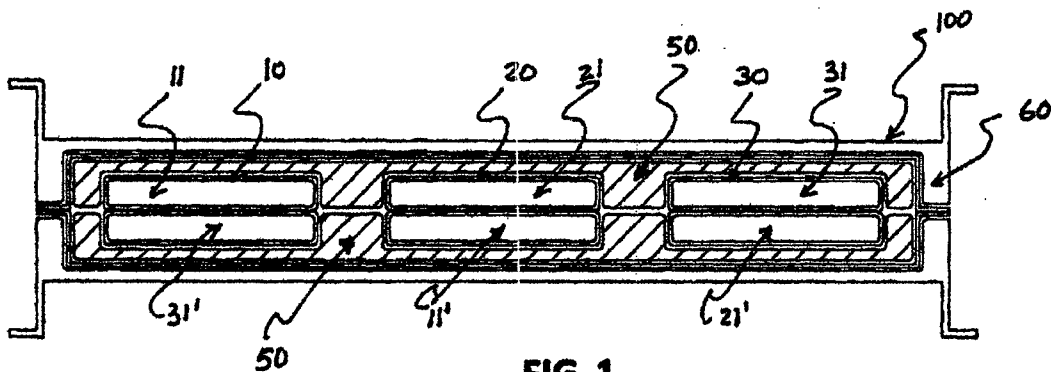


FIG 1

(57) Abstract: A paired phase electrical power distribution bus way system wherein the three phase paired conductors are surrounded and encapsulated by the neutral conductor and packed all together with the housing as a company element to obtain equal separation between the neutral bus bar assembly and the paired phase conductors. The neutral conductor or bus bar assembly consists of two covers that sandwich the three pairs of phase conductors and the insulator layers to achieve minimum and equal distance between them and to reduce and balance the impedance between the neutral and the paired conductors. The housing compresses each pair through the neutral conductor and insulation layer to maintain contact between the conductors, the neutral, and the housing to get efficient heat conduction to the outside.

WO 2009/089047 A1

32

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE AS
INTERNATIONAL SEARCHING AUTHORITY FOR THE PCT

In Re: Application of:
Electbus Corporation

Date: July 12, 2010

Serial No: PCT/US09/00131

Examiner: Lee W. Young

Filed: 01/10/2009

Priority Date: 01/10/2008

Atty. Dkt. No. 280367

Title: HIGH EFFICIENCY PAIRED PHASES BUSWAY SYSTEM

AMENDMENT UNDER ARTICLE 19

EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as EXPRESS mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C., 20231, on _____.

I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001), and may jeopardize the validity of this application, document, registration or patent resulting therefrom.

Yvette Ruiz, Patent Department
(Printed name of the person signing the certificate)

(Signature of the person signing the certificate)

Papers included: Amendment, Declaration, photographs, and postcard.

Hon. Commissioner of Patents
Mail Stop: PCT
P.O. Box 1450
Alexandria, VA 22313-1450

5 Sir:

In response to the International Preliminary Search Report, please amend the above referenced international application under article 19 as shown in the enclosed substitute pages.

10

INTRODUCTORY COMMENTS

The Examiner has rejected claims 1 through 6 for lacking an inventive step under PCT Article 33(3) as being obvious over EP 1096632

15 A1 to Burguera in view of US 5,854,445 A to Graham et al.

Applicant respectfully disagrees.

AMENDMENTS TO THE CLAIMS

1. (Original) A three-phase bus duct section comprising:

5 A) first, second and third bus bar pairs; each of said pairs including first and second flat bar conductors kept at a parallel and spaced apart relationship with respect to each other and said first and second flat bar conductors wherein said conductors are connected to achieve paired phase conductor effect, respectively;

10 B) neutral bus bar assembly having cooperative dimensions to encapsulate said first, second, and third pairs without being electrically connected; and

15 C) housing means supporting said neutral bus bar assembly.

2. (Original) The bus duct section set forth in claim 1 wherein the separation between said neutral bus bar assembly and said first, second, and third bus bar pairs is substantially the same.

20 3. (Original) The bus duct section set forth in claim 2 wherein said first and second flat bar conductors have opposing facing surfaces separated by an electrical insulator.

25 4. (Original) The bus duct section set forth in claim 3 wherein said housing means is grounded.

5. (Original) The bus duct section set forth in claim 4 wherein said neutral bus bar assembly transmits the heat from said flat bar conductors to said housing means so that said heat is dissipated.

5 6. (Original) The bus duct section set forth in claim 5 wherein the encapsulation of said first, second, and third pairs clamps the latter resulting in a mechanically stable structure to withstand the effects of short circuits.

10

REMARKS

The Examiner has rejected claims 1 through 6 for lacking an inventive step under PCT Article 33(3) as being obvious over EP 1096632 A1 to Burguera in view of US 5,854,445 A to Graham et al.

Applicant respectfully disagrees. The Examiner explains that Applicant's prior European patent publication (Burguera) teaches a three-phase bus duct section with the conductors achieving paired phase conductor effect. The Examiner admits that Burguera does not teach that the neutral bus bar assembly has cooperative dimensions to encapsulate the paired phase conductors. The Examiner combines the teachings in Graham for a proposed encapsulation of the three paired phase conductors and points out protective sheet 52b. This element, however, is not an electrical conductor and, consequently, is not capable of producing the same effect as an encapsulating neutral bus bar assembly, as claimed in claim 1. If anything, the proposed combination teaches away from the invention.

Nobody, including the Applicant himself, had thought of this novel approach notwithstanding more than five decades of use of this technology. There is no reasonable expectation to make the additional modification to the combination proposed by the Examiner of replacing the insulating protective sheet 52b with an electrical conduct bus assembly carrying an electrical neutral.

There is nothing in Graham to suggest that it intended to reduce magnetic leakage. While increasing heat dissipation, improved mechanical stability, and reduction of magnetic leakage are desirable goals, there is no reasonable expectation to make the proposed
5 combination, much less to change an insulator for a conductor.

With respect to claim 2, it is evident, when compared to the prior art, that the separation between the neutral bar assembly and the paired conductors is not as uniform as in the present invention where the
10 paired-phase conductors are encapsulated by the neutral.

Claims 3 and 4 are dependent claims and carry the same limitations as the claims from which they depend.

15 Finally, with respect to claim 5, Burguera discloses a device with heat dissipation through two points only. The encapsulation in the claimed invention provides greater areas for heat dissipation. This is an additional advantage of the present invention.

20 Applicant believes its application is not obvious in view of the cited art, taken singly or in combination, and that the claimed subject matter meets the inventive step requirements of PCT Article 33(3).

25 Respectfully submitted,

SANCHELIMA AND ASSOC., P.A.
Attorneys for Applicant
Reg. No. 28,755

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

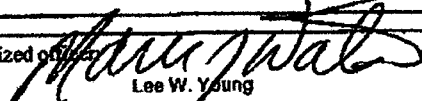
To:
JESUS SANCHELIMA
235 S.W. LE JEUNE ROAD
MIAMI, FL 33134

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) 24 FEB 2009	
Applicant's or agent's file reference 280367	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US 09/00131	International filing date (day/month/year) 10 January 2009 (10.01.2009)
Applicant ELECTBUS CORPORATION	

- ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.
Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):
When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.
Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 740 14 35
For more detailed instructions, see the notes on the accompanying sheet.
- ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
- ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
- Reminders**
Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.
The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.
Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.
In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.
See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer  Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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Form PCT/ISA/220 (January 2004)

(See notes on accompanying sheet)

Serial No. PCT/US09/00131

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re: Application of:
Electbus Corporation

Date: April 24, 2009

5 Serial No: PCT/US09/00131

Examiner: Lee W. Young

Filed: 01/10/2009

Priority Date: 01/10/2008

Atty. Dkt. No. 280367

Title: **HIGH EFFICIENCY PAIRED PHASES BUSWAY SYSTEM**

10

DECLARATION OF ELIO BURGUEIRA

The undersigned declares as follows:

15

1. I am the Applicant herein. I am the owner and chief operating officer of Electbus Corporation. This company is dedicated to manufacturing, selling, and installing paired phases busway systems.

20

2. I am an electrical engineer and have been working in the paired phases busway systems for over 30 years.

25

3. Until shortly after filing the present application, my company manufactured and sold paired phases busway systems as conventionally known, such as the one disclosed in patent publication EP 1,096,632. Since then, however, my company is currently changing the entire production to the new design, as claimed in the present application, wherein the neutral conductor encapsulates the three paired conductors. This achieves more efficiency in that all paired conductors have the same separation from the electrical neutral.

30

4. Inherent with my new claimed design is a more compact and efficient busway system. See picture "A", attached. Being more volumetrically efficient permits the use of my system where space limitations are critical.

5. The new design has been well accepted and our company is incorporating it in multi-million dollar building structure projects. See attached pictures "B" and "C" of our recent project with our claimed paired phases busway system. In this project, the original conventional system installed had a capacity of 600 amperes and it was not enough. We were able to install two of our busway systems providing a combined capacity of 12,400 amperes. The space limitations prevented the use of the conventional system.

15

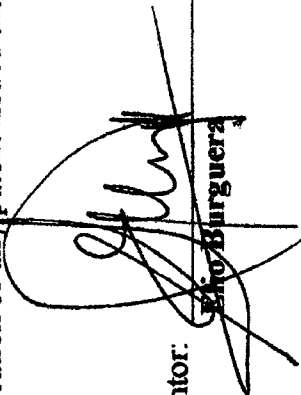
20

25

30

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

10 Inventor:


Mario Burguera

Date:

April 24/2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/00131

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01B 11/02 (2009.01)
USPC - 174/27

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)
USPC - 174/27

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 174/24, 27, 68.2, 99B, 117FF, 117AS, 658 (keyword limited, see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(PGPB,USPT,EPAB,JPAB); Google. Search Terms Used: heat, short circuit, clamp, housing, ground, 3 phase, insulate, encapsulate, bus, neutral, enclose, envelope, contain, surround, paired phase, power, distribution, electrical, transmission, three pairs

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1096632 A1 (Burguera) 02 May 2001 (02.05.2001) entire document, especially: Fig. 2B, Fig. 5, para. [0011], [0022], [0023]	1-6
Y	US 5,854,445 A (Graham et al.) 29 December 1998 (29.12.1998) Fig. 3A, col. 3, ln 47-49, 59-64, col. 5, ln 4-22	1-6
A	US 4,845,188 A (Jackson) 31 July 1990 (31.07.1990) entire document	1-6
A	US 4,112,249 A (Carlson) 05 September 1978 (05.09.1978) entire document	1-6

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

- * 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 but published on or after the international filing date
- "I" document which may throw doubts on 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
- "P" 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 combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search
16 February 2009 (16.02.2009)

Date of mailing of the international search report
24 FEB 2009

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer
Lee W. Young
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: JESUS SANCHELIMA
235 S.W. LE JEUNE ROAD
MIAMI, FL 33134

Date of mailing
(day/month/year) 24 FEB 2009

Applicant's or agent's file reference
280367

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/US 09/00131

International filing date (day/month/year)
10 January 2009 (10.01.2009)

Priority date (day/month/year)
10 January 2008 (10.01.2008)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H01B 11/02 (2009.01)
USPC - 174/27

Applicant ELECTBUS CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioners for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Date of completion of this opinion
16 February 2009 (16.02.2009)

Authorized officer:

Lee Y. Young
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 09/00131

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ on paper
☐ in electronic form
 - c. time of filing/furnishing
☐ contained in the international application as filed
☐ filed together with the international application in electronic form
☐ furnished subsequently to this Authority for the purposes of search
4. ☐ * In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 09/00131

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-6	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-6	NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6 lack an inventive step under PCT Article 33(3) as being obvious over EP 1096632 A1 to Burguera in view of US 5,854,446 A to Graham et al. (hereinafter 'Graham').

As per claim 1, Burguera teaches a three-phase bus duct section comprising: first, second and third bus bar pairs (Fig. 5, para. [0022]); each of said pairs including first and second flat bar conductors kept at a parallel and spaced apart relationship with respect to each other and said first and second flat bar conductors wherein said conductors are connected to achieve paired phase conductor effect, respectively (Fig. 5, para. [0022]); and a neutral bus bar assembly (para. [0011]); and a housing means supporting said neutral bus bar assembly (Fig. 2B, Fig. 5, para. [0023]). Burguera does not teach that the neutral bus bar assembly has cooperative dimensions to encapsulate said first, second, and third pairs without being electrically connected. However, Graham does teach that the assembly (protection sheet, 52b) has cooperative dimensions to encapsulate said first, second, and third pairs without being electrically connected (Fig. 3A, col. 5, in 16-22). It would have been obvious to one of ordinary skill in the art to modify the neutral bus bar assembly so that it additionally encapsulates the buses, as taught by Graham, because this allows for an increase in heat dissipation, improves mechanical stability, and reduces magnetic leakage, thus improving the quality of the overall system.

As per claim 2, Burguera teaches the bus duct section set forth in claim 1 wherein the separation between said neutral bus bar assembly and said first, second, and third bus bar pairs is substantially the same (Fig. 5, para. [0011]).

As per claim 3, Burguera teaches the bus duct section set forth in claim 2 wherein said first and second flat bar conductors have opposing facing surfaces separated by an electrical insulator (Fig. 5, para. [0023]).

As per claim 4, Burguera in view of Graham teaches the bus duct section set forth in claim 3. Burguera does not teach wherein said housing means is grounded. However, Graham does teach wherein said housing means is grounded (col. 3, in 47-49). It would have been obvious to one of ordinary skill in the art to modify the housing so that it is grounded, as taught by Graham, because this improves the reliability of the grounding in the duct system, thus increasing the safety and improving the overall performance of the system.

As per claim 5, Burguera teaches the bus duct section set forth in claim 4 wherein said neutral bus bar assembly transmits the heat from said flat bar conductors to said housing means so that said heat is dissipated (para. [0011], [0023]).

As per claim 6, Burguera in view of Graham teaches the bus duct section set forth in claim 5. Burguera does not teach that wherein the encapsulation of said first, second, and third pairs clamps the latter resulting in a mechanically stable structure to withstand the effects of short circuits. However, Graham does teach that wherein the encapsulation of said first, second, and third pairs clamps the latter resulting in a mechanically stable structure to withstand the effects of short circuits (col. 3, in 59-64, col. 5, in 4-14). It would have been obvious to one of ordinary skill in the art to modify the duct system so that a clamping mechanism is used to provide a mechanically stable structure to withstand the effects of short circuits, as taught by Graham, because this improves the reliability and safety of the system thus improving the overall performance.

Claims 1-6 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

PATENTE

☒

MODELO DE UTILIDAD

DISEÑO INDUSTRIAL

ELECTBUS CORPORATION

SOLICITANTES/ RAZON SOCIAL O APELLIDOS Y NOMBRES

DOMICILIO

MIAMI (FLORIDA) ESTADOS UNIDOS

APODERADO

CAROLINA VERA MATIZ

TITULO

SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE FASES ACOPLADAS

CLASIFICACION

EXPEDIENTE No.

FECHA DE SOLICITUD

12/07/2010

ROLLO MICROFILM

CERTIFICADO No.

FECHA DE CONCESION

VIGENCIA DESDE

HASTA

PRORROGA

CAMBIO DE NOMBRE

TRASPASO A

INVENTOR (ES)

ELIO BURGUERA

OTROS

85

(21) N° de solicitud: (22) Fecha de solicitud: **12 de julio de 2010**

(51) Clasificación Internacional :

(71) Solicitante(s)

ELECTBUS CORPORATION

(72) Inventor(es)

ELIO BURGUEIRA

(74) Agente: **CAROLINA VERA MATIZ**

(30) Prioridad

(31) No. Prioridad (32) Fecha (33) - País

(85) Fecha inicio fase nacional:

(86) Datos relativos a la presentación de la solíc. PCT

Fecha de presentación de la solicitud:

No. de solicitud PCT/

(87) Publicación internacional:

Fecha:

No. Publicación : WO

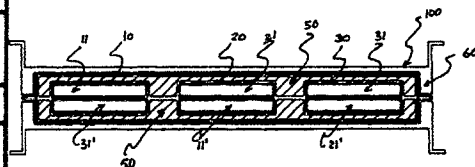


FIG 1

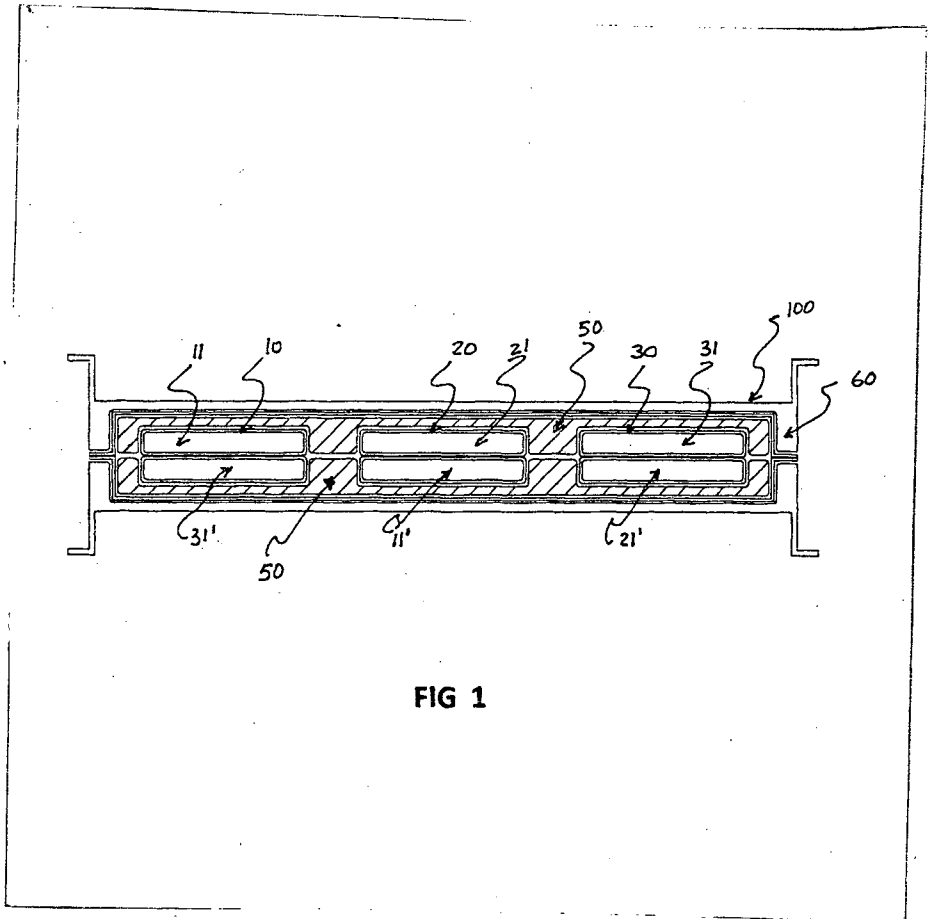
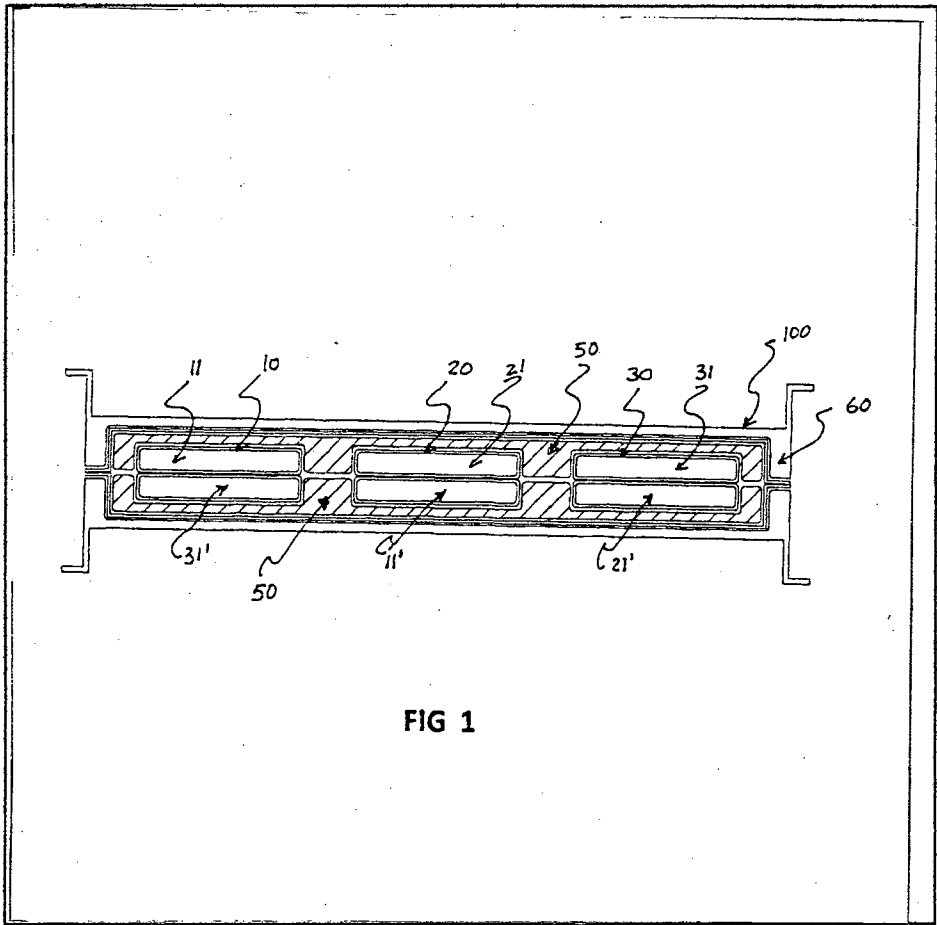
(54) Título:

SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE FASES ACOPLADAS

(57) Resumen: Un sistema de barras colectoras de fases acopladas para distribución de energía eléctrica donde los tres pares o acoples de conductores están rodeados y encapsulados por un conductor neutro y empacados entre sí con la carcasa a manera de un elemento compacto para obtener igual separación entre la barra neutra y los conductores de fase acopladas. El ensamble de la barra o conductor neutro consiste de dos cubiertas que aprisionan los tres pares de conductores de fase y las capas aislantes a fin de obtener una mínima e igual distancia entre ellos y reducir y balancear la impedancia entre la barra neutra y los conductores acoplados. La carcasa comprime cada par a través del conductor neutro y la capa aislante para mantener un contacto entre los conductores, la barra neutra y la carcasa con miras a una eficiente disipación del calor al exterior.

CONTINUA AL RESPALDO ... 

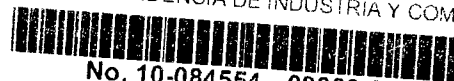
Mixta SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE
FASES ACOPLADAS
Clase: P1



 Industria y Comercio SUPERINTENDENCIA		SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES EXTRACTO PARA PUBLICACIÓN SOLICITUD DE PATENTE DE INVENCION	
(21) N° de solicitud: 22) Fecha de solicitud: 12 DE JULIO 2010 (30) Prioridad (31) No. Prioridad 32) Fecha (33) País		(51) Int Cl: (71) Solicitante(s) ELECTBUS CORPORATION (72) Inventor(es) ELIO BURGUERA (74) Agente: CAROLINA VERA MATIZ	
(54) Título: SISTEMA DE ALTA EFICIENCIA DE BARRAS COLECTORAS DE FASES ACOPLADAS			
Reivindicación(es):			

1. Una sección de ducto para barras colectoras de tres fases que comprende:
 - A. un primero un segundo y un tercero acople o pares de barras colectoras; cada uno de ellas incluyendo primero y segundo conductores planos paralela y espaciadamente colocados entre sí y donde dichos primeros y segundos planos van conectados para obtener un efecto conductor de fases acopladas respectivamente;
 - B. un ensamble de barra neutro que tiene dimensiones cooperantes para encapsular dicho primero segundo y tercer acople o pares sin estar eléctricamente conectados; y
 - C. medios de cubierta o carcaza que soportan dicho ensamble de barra neutra.
2. Una sección de ducto conforme a la reivindicación 1 donde la separación entre dicha barra neutra y dicho primero segundo y tercer acople de par de barras es sustancialmente la misma.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 10-084554- -00000-0000

Fecha: 2010-07-12 16:12:21 Dep. 2020 DIR.NUEVASOR
 Tra. 11 PATENTEIYII Eve: 379 FASENACIONALII
 Act. 411 PRESENTACION Folios: 51

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 10 - 56,615
 FECHA : JULIO 9 DE 2010

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
VERA ABOGADOS ASOCIADOS	CONSIGNACION	BANCO DE BOGOTA	062754387	354822241	09/07/2010	554,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
1		TRAMITES DE SOL. DE PATENTE DE IN	554,000.00
		TOTAL :	\$ 554,000.00

SON: QUINIENTOS CINCUENTA Y CUATRO MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____



No. 10-084554- -00000-0000

Fecha: 2010-07-12 16:12:21

Dep. 2020 DIR.NUEVASCR

Tra. 11 PATENTEIYII

Eve: 379 FASENACIONALII

Act 411 PRESENTACION

Folios: 51

PATENTE DE INVENCION ☐MODELO DE UTILIDAD ☐

Art 33 Decisión 486/00

☐	Indicación que se solicita una patente.
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Descripción de la invención
☐	Dibujos de ser estos pertinentes
☐	Comprobante de pago de las tasas establecidas (De ser el caso formato de descuento)
Completa ☐	Incompleta ☐

PATENTE DE INVENCION PCT ☒MODELO DE UTILIDAD PCT ☐

Art.33 Decisión 486/00, Circular Única

☒	Indicación que se solicita una PCT
☒	Copia de la solicitud en español, tal como fue presentada inicialmente (capítulo descriptivo, reivindicatorio, resumen)
☐	Dibujos de ser estos pertinentes
☒	Comprobante de pago de las tasas establecidas (de ser el caso formato de descuento)
Completa ☐	Incompleta ☐

DISEÑO INDUSTRIAL ☐

(Art. 119 Decisión 486/00)

☐	Indicación que se solicita Diseño industrial
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica y fotográfica del Diseño industrial o muestra del material que incorpora el diseño
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐

ESQUEMA DE TRAZADO ☐

(Art. 92 Decisión 486/00)

☐	Indicación que se solicita un esquema de trazado
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica de un esquema de trazado
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐

Bogotá D.C.,
2020

Doctor(a)
VERA MATIZ CAROLINA
Apoderado(a) y/o Representante de
ELECTBUS

REFERENCIA	Radicación No.	10 084554
	Solicitud internacional	PCT/US2009/00131
	Fecha inicio fase nacional	10/08/2010
	Trámite	11
	Evento	379
	Actuación	430
	Oficio No.	1 36 2 24

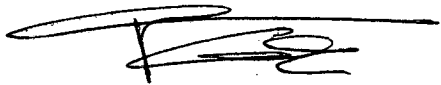
Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

1. La solicitud no contiene el poder debidamente otorgado, con el lleno de los requisitos exigidos por los artículos 63 y subsiguientes del Código de Procedimiento Civil. Adicionalmente, deberá presentar el documento que acredita la existencia y representación legal de la sociedad solicitante, cuando ésta fuere persona jurídica.
2. Debe aclarar el número de la publicación internacional de fecha.
3. La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente del inventor al solicitante o a su causante, conforme a lo establecido por el artículo 26 literal k) de la Decisión 486 de la Comisión de la Comunidad Andina. Cuando se trate de documentos otorgados en el extranjero, estos deberán legalizarse de conformidad con lo dispuesto por los artículos 259 y 260 del Código de Procedimiento Civil. Cuando se trate de las declaraciones a que hace referencia la Regla 4.17 ii) del Tratado de Cooperación en Materia de Patentes PCT., el alcance de las tales declaraciones se determinará según indiquen claramente una cesión de derechos del inventor al solicitante o su causante, de conformidad con lo dispuesto en el numeral 5.2.15 del Capítulo Quinto, Título X de la Circular Única de Superintendencia de Industria y Comercio.

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Continúa en la página siguiente...

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Unica No.10 de 2001.



JOSE LUIS SALAZAR LOPEZ
Director de Nuevas Creaciones (C)

02 SET. 2011

El anterior requerimiento fue notificado por fijación en lista de fecha _____
adpa11