

Clarke, Modet & Cº

COLOMBIA

P-2667

SUPERINTENDENCIA DE INDUSTRIA Y COM
DIVISION DE NUEVAS CREACIONES

E.

S.

D.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 10-124686- -00002-0000

Fecha: 2010-11-22 16:06:56 Dep. 2020 DIR.NUEVASCR
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios: 102

Ref.: Expediente No. 10.124.686
Solicitud de Patente a nombre de
LEVITON MANUFACTURING CO. INC.

Yo, DILIA MARÍA RODRÍGUEZ D'ALEMAN, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, piso 6, obrando como apoderada de la sociedad LEVITON MANUFACTURING CO. INC., solicitante de la patente de la referencia, en respuesta al oficio No. 14007 notificado por fijación en lista el día 28 de octubre de 2010, atentamente me permito presentar:

1. Documento donde consta la cesión del derecho a la patente otorgada por los inventores a favor de mi mandante. Sobre el particular, es importante resaltar que de conformidad con las normas legales vigentes, artículo 1 de la Resolución 210 de 2001, expedida por el Superintendente de Industria y Comercio y artículo 2 de la Convención de la Haya, el documento en inglés que se pretenda aportar como parte de los trámites de propiedad industrial ante la Superintendencia de Industria y Comercio no requieren traducción. Por otro lado, la legalización consular y/o diplomática de los documentos expedidos en el extranjero no es necesaria. Por lo tanto, el documento de cesión anexo a este memorial es válidamente presentado en idioma inglés y con la correspondiente apostilla.

2. Copia auténtica del poder junto con el Certificado de Existencia y Representación Legal de dicha sociedad y con su respectiva traducción del inglés al español.

3. Copia certificada de la solicitud de Patente número 12/604,207 de 22 de octubre de 2009, con la debida traducción de lo pertinente

Espero con esto haber dado cabal cumplimiento a lo solicitado por ese despacho y de conformidad con lo indicado en los artículos 3º, inciso 3, 35 inciso 2 y 59 inciso 2 del CCA, al analizar este memorial, atentamente ruego se traten todas las cuestiones planteadas con motivo del mismo.


DILIA MARÍA RODRÍGUEZ D'ALEMAN
C.C. 41.654.882 de Bogotá.
T.P. 20824 CSJ

APOSTILLE

(Convention de La Haye du 5 octobre 1961)

1. Country: United States of America

This public document

2. has been signed by M. K. Carter

3. acting in the capacity of Certifying Officer

4. bears the seal/stamp of Patent and Trademark Office

Certified

5. at Washington, D.C.

6. the fourteenth of October, 2010

7. by Assistant Authentication Officer, United States Department of State

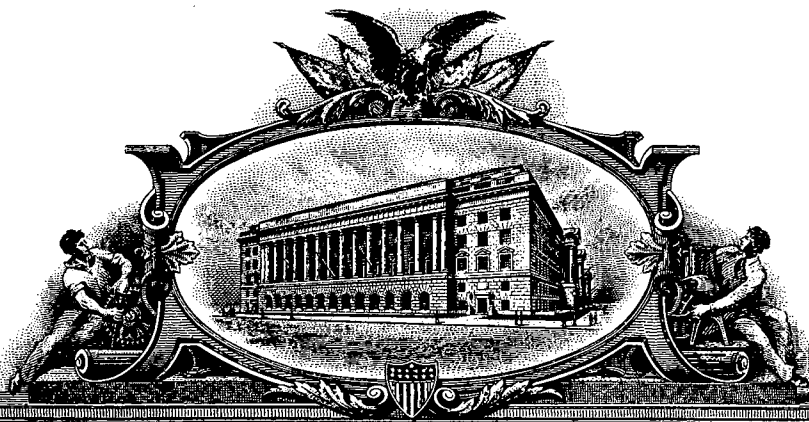
8. No. 11001539-10

9. Seal/Stamp:

10. Signature:

Sonya N. Johnson

A 7255593



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

September 02, 2010

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE
RECORDS OF THIS OFFICE OF A DOCUMENT RECORDED ON
MARCH 08, 2010.

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

M. K. CARTER
Certifying Officer



71

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT										
NATURE OF CONVEYANCE:	ASSIGNMENT										
CONVEYING PARTY DATA											
<table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>FRANKLIN C. MARTI</td> <td>10/20/2009</td> </tr> <tr> <td>JEFFREY ALAN POULSEN</td> <td>10/20/2009</td> </tr> <tr> <td>JASON ERICKSON</td> <td>10/20/2009</td> </tr> <tr> <td>JEFFREY P. SEEFRIED</td> <td>10/20/2009</td> </tr> </tbody> </table>		Name	Execution Date	FRANKLIN C. MARTI	10/20/2009	JEFFREY ALAN POULSEN	10/20/2009	JASON ERICKSON	10/20/2009	JEFFREY P. SEEFRIED	10/20/2009
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JEFFREY ALAN POULSEN	10/20/2009										
JASON ERICKSON	10/20/2009										
JEFFREY P. SEEFRIED	10/20/2009										
RECEIVING PARTY DATA											
<table border="1"> <tr> <td>Name:</td> <td>LEVITON MANUFACTURING CO., INC.</td> </tr> <tr> <td>Street Address:</td> <td>201 NORTH SERVICE ROAD</td> </tr> <tr> <td>City:</td> <td>MELVILLE</td> </tr> <tr> <td>State/Country:</td> <td>NEW YORK</td> </tr> <tr> <td>Postal Code:</td> <td>11747</td> </tr> </table>		Name:	LEVITON MANUFACTURING CO., INC.	Street Address:	201 NORTH SERVICE ROAD	City:	MELVILLE	State/Country:	NEW YORK	Postal Code:	11747
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Postal Code:	11747										
PROPERTY NUMBERS Total: 1											
<table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>12604207</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	12604207						
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Application Number:	12604207										
CORRESPONDENCE DATA											
Fax Number: (425)455-1046 <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i> Phone: 425.455.5575 Email: rchow@graybeal.com Correspondent Name: GRAYBEAL JACKSON LLP Address Line 1: 400 - 108TH AVENUE NE, SUITE 700 Address Line 4: BELLEVUE, WASHINGTON 98004											
ATTORNEY DOCKET NUMBER:	2672-009-03										
NAME OF SUBMITTER:	PAUL F. RUSYN										
Total Attachments: 3 source=2672-009-03_Assignment_20100308#page1.tif											

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PATENT
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PATENT
REEL: 024047 FRAME: 0517

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ASSIGNMENT

WHEREAS we, Franklin C. MARTI, Jeffrey Alan POULSEN, Jason ERICKSON, and Jeffrey P. SEEFRIED (hereinafter "ASSIGNORS"), having mailing addresses of 4347 Shadowood Drive, Clinton, Washington 98236-9541; 586 Elm Way, Edmonds, Washington 98020; 2222 - 222nd Street SE, Bothell, Washington 98021-4422; and 11512 - 18th Place SE, Lake Stevens, Washington 98258-2032, respectively, are the joint inventors of the invention(s) disclosed in an application for United States letters patent entitled, "HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS", having a filing date of October 22, 2009, and having been allotted United States Patent Application Serial No. 12/604,207 (if not present when this instrument is executed, applicants' attorney or agent is authorized to enter the application serial number and filing date upon receipt of the same from the United States Patent and Trademark Office);

WHEREAS, Leviton Manufacturing Co., Inc. (hereinafter "ASSIGNEE"), a juristic entity of the State of Delaware, having a principle place of business at 201 North Service Road, Melville, New York 11747, is desirous of acquiring the entire right, title, and interest in and to the invention(s), application(s), and/or any letters patent(s) that may be granted therefor in the United States and in any and all foreign countries;

NOW, THEREFORE, in exchange for good and valuable consideration, the receipt of which is hereby acknowledged, ASSIGNORS hereby sell, assign, and transfer unto said ASSIGNEE the entire right, title, and interest in and to said invention(s), said application(s), including any and all nonprovisional application(s) for letters patent claiming priority thereto, and any and all letters patent(s) which may be granted therefor in the United States of America and its territorial possessions and in any and all foreign countries, and in any and all divisional, reissue, continuation, continuation-in-part, and substitute application(s) thereof, including the right to file any foreign application(s) directly in the name of ASSIGNEE and to claim priority rights deriving from said United States application(s) to which said foreign application(s) are entitled by virtue of international convention, treaty, or otherwise, said invention(s), application(s) and any and all letters patent(s) granted therefor to be held and enjoyed

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by ASSIGNEE, its successors, and assigns as fully and entirely as same would have been held and enjoyed by ASSIGNORS had this assignment, transfer, and sale not been made;

ASSIGNORS hereby authorize and request the Director of the United States Patent and Trademark Office to issue any and all letters patent(s) on said invention(s) to ASSIGNEE;

ASSIGNORS hereby covenant that no assignment, sale, agreement, or encumbrance has been or will be made which would conflict with this assignment;

ASSIGNORS further transfer and assign to ASSIGNEE all causes of action, rights, and remedies arising under any such application(s) for United States and/or foreign letters patent(s) on said invention(s) prior to or after the effective date of this Assignment; and

ASSIGNORS agree to execute all instruments and documents required for the making and prosecution of applications for any and all application(s) for United States and/or foreign letters patent(s) on said invention(s), for litigation regarding any and all application(s) and/or letters patent(s), and/or for the purpose of protecting title to said invention(s), application(s), and/or letters patent(s) therefor.

ASSIGNEE's counsel is authorized to insert the official filing date and/or application serial number information when it becomes available.

10/20/09
Date

Franklin C. Marti
Franklin C. MARTI

State of WASHINGTON

County of SNOHOMISH

) ss.

I hereby certify that I know or have satisfactory evidence that Franklin C. MARTI is the person who appeared before me on the date specified above, and that said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.



Signature of Notary Public :

Printed Name of Notary Public :

My appointment expires :

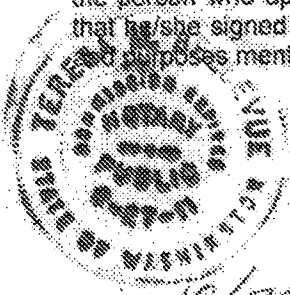
Teresa M. Bellevue
TERESA M. BELLEVUE
10/27/2011

Date 10/20/2009
State of WASHINGTON
County of SNOHOMISH

Jeffrey Alan Poulsen
Jeffrey Alan POULSEN

ss.

I hereby certify that I know or have satisfactory evidence that Jeffrey Alan POULSEN is the person who appeared before me on the date specified above, and that said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.



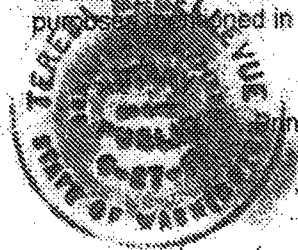
Signature of Notary Public : Teresa M. Bellevue
Printed Name of Notary Public : TERESA M. BELLEVUE
My appointment expires : 6/27/2011

Date 10/20/2009
State of WASHINGTON
County of SNOHOMISH

Jason Erickson
Jason ERICKSON

ss.

I hereby certify that I know or have satisfactory evidence that Jason ERICKSON is the person who appeared before me on the date specified above, and that said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.



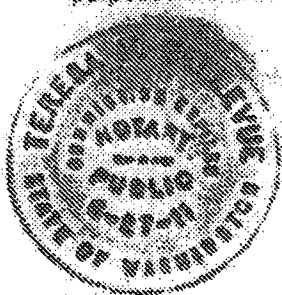
Signature of Notary Public : Teresa M. Bellevue
Printed Name of Notary Public : TERESA M. BELLEVUE
My appointment expires : 6/27/2011

Date 10/20/2009
State of WASHINGTON
County of SNOHOMISH

Jeffrey P. Seefried
Jeffrey P. SEEFRIED

ss.

I hereby certify that I know or have satisfactory evidence that Jeffrey P. SEEFRIED is the person who appeared before me on the date specified above, and that said person acknowledged that he/she signed this instrument and acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in the instrument.



Signature of Notary Public : Teresa M. Bellevue
Printed Name of Notary Public : TERESA M. BELLEVUE
My appointment expires : 6/27/2011

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Traducción oficial de un documento que está originalmente en inglés

Hoja adjunta:

"195723" Estado de Nueva York, Condado de Queens

Yo, Gloria D'Amico, Registrador del Condado de Queens y Registrador de la Suprema Corte en y para dicho Condado, la cual es una Corte de Registro, que tiene un sello, certifico por el presente documento que Ann Wilkinson cuyo nombre está suscrito al instrumento original anexo ha sido comisionada y autorizada como Notario Público de la ciudad de New York y ha archivado su firma autógrafa en esta oficina y que ella era al momento de tomar dicha prueba o reconocimiento o juramento debidamente autorizado por las Leyes del Estado de New York para tomarlo; que ella está bien familiarizada con la escritura de dicho funcionario público o ha comparado la firma que se encuentra en el certificado de prueba o reconocimiento o juramento con la firma autógrafa archivada en su oficina por dicho funcionario público y cree que la firma del instrumento original es genuina.

En constancia de lo anterior, pongo mi firma y mi sello oficial, hoy, 12 de octubre de 2010.

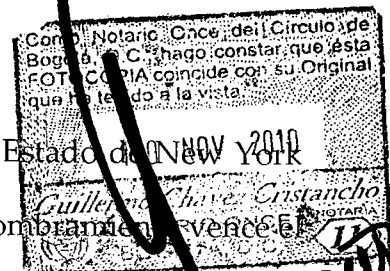
(Firma mecánica) Gloria D'Amico. Registrador de Condado-del Condado de Queens

Sello redondo del Contado de Queens.

Hay un sello rectangular: "Ann Wilkinson. Notario Público. Estado de New York

No. 01w16202587. Calificado en el Condado de Queens. Mi nombramiento vence el

16 de marzo de 2013".



Traductor Oficial

JORGE E. SIERRA REYES

Licencia 376 - 1993 Minjusticia

Apostilla adjunta:

APOSTILLA: (Convention de La Haye du 5 octobre 1961)	
1. País:	Estados Unidos de América
<u>El presente documento público</u>	
2. Ha sido firmado por:	Gloria D'Amico
3. Actuando en calidad de:	Registrador del Condado
4. Lleva el sello/estampilla de:	Condado de Queens
<u>Certificado</u>	
5. En:	New York, New York
6. El:	13 de octubre de 2010
7. Por:	Secretario del Estado, Estado de New York
8. Bajo el No.:	NYC-10765360B
9. Sello / estampilla:	"Estado de New York, Departamento de Estado"
10. Firma:	(Firmado) Sandra J. Tallman, Subsecretaria Especial del Estado

FIN DE LA TRADUCCIÓN

Certificación:

Certifico que la presente es una traducción auténtica y completa del inglés al español del documento adjunto, la cual he elaborado según mi leal saber y entender.

Documento: "Cert. Notarial"

Fecha: 2 de noviembre 2010.

Traductor: Jorge Enrique Sierra Reyes (Sello y firma digital debidamente registrada en el Departamento de Relaciones Exteriores de Colombia)

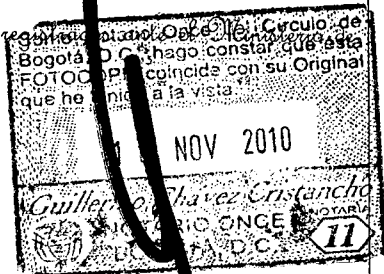
Licencia # 376 de 1993, expedida por el Ministerio de Justicia.

Dirección: Carrera 15 # 99-13 Of. 411, Bogotá, D.C.

Teléfonos: (571) 218 2308, (571) 623 2925.

E-mail: trescer1@yahoo.com

Traducción # 15-616



Traductor Oficial

JORGE E. SIERRA REYES

Licencia 376 - 1993 Minjusticia

P-2667 79

Apostille

(Convention de La Haye du 5 Octobre 1961)

1. Country: **United States of America**
This public document
2. has been signed by **Gloria D'Amico**
3. acting in the capacity of **County Clerk**
4. bears the seal/stamp of the county of **Queens**

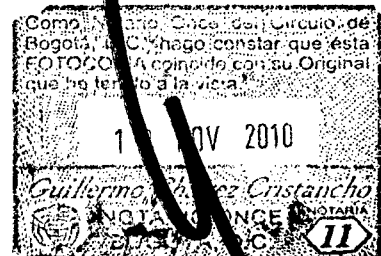
Certified

5. At New York, New York
6. the 13th day of October 2010
7. by Special Deputy Secretary of State, State of New York
8. No. NYC-10765360B
9. Seal/Stamp
10. Signature



Sandra J. Tallman

Sandra J. Tallman
Special Deputy Secretary of State



COLOMBIA

Carrera 11 N° 86-53 Piso 6 Bogotá Colombia Tel: (57 1) 6181088 Fax: (57 1) 6350824 Email: info@clarkernodet.com.co

PODER

Yo (nosotros), abajo firmante(s)

Meir Y. Blonder

en mi (nuestro) carácter de representante(s) legales de

Leviton Manufacturing Co., Inc.

una sociedad organizada y existente de acuerdo con las leyes de

Estados Unidos de América

y en actual cumplimiento de su objeto social, con domicilio en

201 North Service Road Melville NY 11747 USA.

por el presente instrumento confiero (conferimos) poder especial a favor de DILIA MARIA RODRIGUEZ D'ALEMAN, con Cédula de Ciudadanía No. 41.654.882 de Bogotá, y tp. 20824 y CLAUDIA LUCIA CARO RAMIREZ, con Cédula de Ciudadanía No. 40.017.374 de Tunja, y tp. 36448, con domicilio en Bogotá, Colombia, para que actuando en su orden en nombre del (de la) otorgante le (la) representen ante cualquier entidad, autoridad y/o persona, especialmente ante las del orden Administrativo, Contencioso Administrativo, Judicial, Tribunales de Arbitramento y/o cualquier otro en lo referente a los siguientes asuntos: *solicitud No. 12/604,207*

- 1) Solicitar, tramitar, obtener y/o registrar cualquiera de las modalidades de Propiedad Industrial, tales como: patentes de invención, modelos de utilidad; diseños industriales, variedades vegetales; marcas, lemas, nombres y enseññas comerciales y denominaciones de origen; así como sus renovaciones, prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 2) Solicitar, tramitar, obtener y/o registrar derechos de autor, en cualquiera de sus presentaciones así como la protección de secretos industriales y know-how.
- 3) Solicitar, tramitar, obtener y/o registrar registros sanitarios, permisos y/o licencias de funcionamiento; así como sus renovaciones o prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 4) Ejercer acciones de oposición, observación, reclamos, reconsideración, reposición, apelación, cancelación administrativa o judicial, nulidad, protección al consumidor, concesión de licencias, protección de secretos industriales y demás acciones y recursos relacionados con derechos derivados de los asuntos arriba indicados y en contra de la competencia desleal, acciones derivadas de la obtención o explotación de licencias, acciones de indemnización de perjuicios. También podrá(n) intervenir en juicios civiles, comerciales, penales, contencioso-administrativos, tutelas y de policía; en acciones o juicios promovidos por el (la) mandante o en contra el (ella).
- 5) Registrar nombres de dominio ante la entidad competente.
- 6) En el ejercicio de este mandato los mandatarios arriba mencionados quedan facultados para: conciliar, cancelar, transigir, comprometer en árbitros, desistir, recibir y tomar posesión de la cosa objeto de litigio y renunciar o desistir a derechos concedidos o en curso de concesión, admitir los hechos del proceso.
- 7) Ratificar o no la agencia oficiosa.
- 8) Así mismo faculto (facultamos) a los mencionados apoderados para recibir notificaciones y designar apoderados judiciales o extrajudiciales, sustituir el presente poder y revocar las sustituciones que hicieren.

Dado y firmado en

a los

días de

Granted and signed at Melville, NY, USA

on this 12

day of

October

2010

at Melville, NY, USA

by

Meir Y. Blonder

Notary Public

for the State of New York

Commission Expires

11/11/2011

Firma / signature

POWER OF ATTORNEY

I (we), the undersigned

Meir Y. Blonder

legal representative(s) of

Leviton Manufacturing Co., Inc.

an organization existing under the laws of

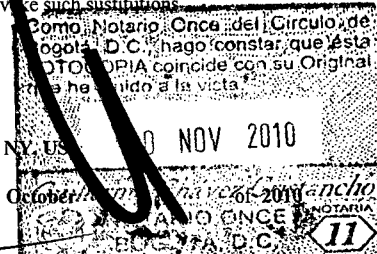
United States of America

and in present execution of its business activity, domiciled at
201 North Service Road, Melville, NY, 11747, USA

do hereby grant POWER OF ATTORNEY to DILIA MARIA RODRIGUEZ D'ALEMAN, identification card No. 41.654.882 of Bogotá, and tp. 20824 and CLAUDIA LUCIA CARO RAMIREZ, tp. 36448, identification card No. 40.017.374 of Tunja, residing in Bogotá, Colombia, to act in the order of their appointment in behalf of grantor before any entity, authority and/or natural or juridical person, specially before those Administrative, Administrative-Contentious, Judicial, arbitration courts, and/or any other, in all matters concerning the following:

For patent application based on US priority No. 12/604,207

- 1) To apply, process, obtain and/or register any of the modalities of Industrial Property, such as: Patents of Invention, Utility Models; Designs, plant varieties; Marks, Slogans, Trade Names and emblems and appellations of Origin; as well as their renewals, assignments, changes of name and/or domicile, agreements and licenses.
- 2) To apply, process, obtain and/or register copyrights of any kind as well as protection of industrial secrets or know-how.
- 3) To apply, process, obtain and/or register sanitary registrations, operating authorizations and/or licenses; as well as their renewals or assignments, changes of name and/or domicile, agreements and licenses.
- 4) To bring actions of opposition, observations, claims, reconsideration, appeal or legal remedies, cancellations, nullity, protection to the consumer, granting of licenses, protection of trade secrets and other actions related with rights derived from the above- mentioned matters and against the unfair competition, actions resulting from the obtaining or exploitation of licenses, recovering damages actions. They can also intervene or participate in Civil, Commercial, Criminal or Contentious-Administrative Trials; the actions for writ mandamus, police actions; in actions, lawsuits or litigations instituted by the grantor or against him.
- 5) To register domain names before the competent entity.
- 6) To the effect of this mandate the above-named proxy are empowered to: conciliate, cancel, settle, submit to arbitration, withdraw and to receive and take possession of the litigation related objet and waive or renounce the rights granted or in process of granting, admit the facts of the case.
- 7) To ratify or not the officious agency.
- 8) I (we) hereby appoint the above mentioned attorneys with powers to receive notifications and to designate judicial and extrajudicial attorneys, substitute this Power of Attorney and to revoke such substitutions.



State of New York }
County of Queens } ss:

No. 195723

Form 1

I, GLORIA D'AMICO, Clerk of the County of Queens, and Clerk of the Supreme Court in and for said county, the same being a court of record having a seal, DO HEREBY CERTIFY THAT

Ann. WILKINSON

whose name is subscribed to the annexed original instrument has been commissioned and qualified as a NOTARY PUBLIC

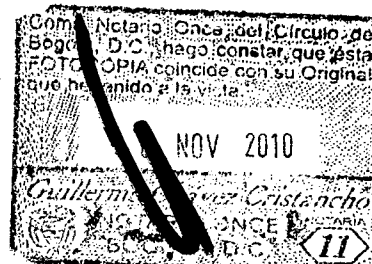


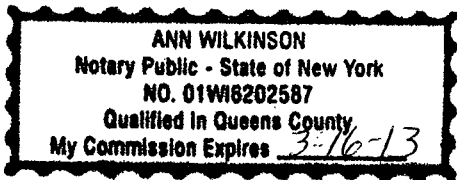
and has filed his autograph signature in this office and that he/she was at the time of taking such proof or acknowledgment or oath duly authorized by the laws of the State of New York to take the same; that he is well acquainted with the handwriting of such public officer or has compared the signature on the certificate of proof or acknowledgment or oath with the autograph signature filed in his office by such public officer, and he believes that the signature on the original instrument is genuine.

IN WITNESS WHEREOF, I have hereunto set my hand and my official seal this

OCT 13 2010

Gloria D'Amico
County Clerk, Queens County





CERTIFICADO NOTARIAL

(Cuando el solicitante es SOCIEDAD)

(Poderes otorgados en: El Salvador, Estados Unidos, México y Venezuela)

A los _____ días del mes de _____ de _____, el Notario que suscribe DA FE de que:

1. Meir Y. Blonder
(nombre de la persona que firma el poder)

mayor de edad y domiciliado en New York
USA firmó de su puño y letra el documento que antecede.

2. Conoce al (a la) otorgante y que este (a) está legalmente capacitado para el otorgamiento.

3. El otorgante ha firmado el referido documento en su carácter de _____
de la persona jurídica Leviton Manufacturing Co. Inc.

4. La citada persona jurídica con sede en _____ está legalmente constituida, que tiene actualmente existencia legal y que el acto para el cual se ha otorgado este poder está comprendido entre los que constituyen su objeto social.
5. El otorgante tiene efectivamente la representación que ostenta, que esta es legítima y que está facultado para otorgar este poder.
6. las anteriores certificaciones de los puntos 3, 4 y 5, me constan porque he tenido a la vista los documentos auténticos.

Notario Público

NOTA: A continuación de lo anterior, el Cónsul de Colombia debe autenticar la firma del Notario Público.

CERTIFICADO NOTARIAL (Cuando el solicitante es INDIVIDUO)

A los _____ días del mes de _____ de _____, el Notario que suscribe DA FE de que:

1. _____
(nombre de la persona que firma el poder)

mayor de edad y domiciliado en _____
firmó en su presencia el documento que antecede, conoce al otorgante y que este está legalmente capacitado para el otorgamiento.

Notario Público

NOTA: A continuación de lo anterior, el Cónsul de Colombia debe autenticar la firma del Notario Público.

Para todos los demás países el Señor Cónsul de Colombia o ante quien se otorgue, debe expedir una certificación dejando constancia 1) de la existencia legal de la sociedad, 2) de que esta ejerce actualmente su objeto social, y 3) de que la persona o personas que otorgan el poder están facultadas para hacerlo, dejando constancia así mismo de que tuvo a la vista las pruebas que acrediten tales circunstancias.

LEGALIZACIÓN POR EL CONSUL DE COLOMBIA O POR APOSTILLA

NOTARIAL CERTIFICATE

(When the applicant is a CORPORATION)

(Powers of attorney granted in: El Salvador, Mexico, U.S.A. and Venezuela)

This 12 day of October, 2010
the undersigned Notary CERTIFIES that:

1. Meir Y. Blonder
(name of the person who signs the power of attorney)

of legal age and domiciled in New York
USA set his hand on the foregoing document.

2. The grantor is to him personally known and that he/she has legal capacity to execute the document.

3. The grantor has executed the foregoing document in his capacity of Chief IP Counsel
of the juridical person Leviton Manufacturing Co. Inc.

4. The mentioned juridical person with place of business in Melville, NY, USA

is duly organized, has actual legal existence and that the purposes for which the power of attorney is granted are within the scope of its corporate purposes.

5. The grantor has in fact the referred quality and that his/her representation is legal and that he/she is empowered to grant this power of attorney.

6. I have based the above certifications 3, 4 and 5, on the authentic documents which for such purpose were exhibited to me.

Ann Wilkinson
Notary Public

NOTA: Then the Colombian Consul must legalize the signature of the Notary Public.

NOTARIAL CERTIFICATE (When the applicant is an INDIVIDUALS)

On this _____ day of _____
the undersigned Notary CERTIFIES that:

1. _____
(name of the person who signs the Power of Attorney)

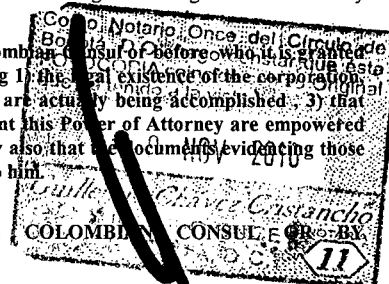
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signed in his presence the foregoing document, the grantor is to him personally known and that he/she has legal capacity to execute the document.

Notary Public

NOTA: Then the Colombian Consul must legalize the signature of the Notary Public.

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La presente es para certificar que el anexo es una copia fiel de los registros de la Oficina de Patentes y Marcas de los Estados Unidos, de los documentos de la solicitud de patente identificada más adelante, que cumplieron con los requerimientos para concederse una fecha de presentación de acuerdo con 35 USC 111.

Número de Solicitud: 12/604,207

Fecha de Presentación: Octubre 22, de 2009

EL CÓDIGO DEL PAÍS Y EL NÚMERO DE SU SOLICITUD DE PRIORIDAD, PARA SER USADA EN LA PRESENTACIÓN EXTRANJERA BAJO EL CONVENIO DE PARÍS ES US 12/604,207

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APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: *12/604,207*

FILING DATE: *October 22, 2009*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY
APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS
CONVENTION, IS *US12/604,207*

By Authority of the
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M. Tarver

M. TARVER
Certifying Officer

Electronic Acknowledgement Receipt

EFS ID:	6314985
Application Number:	12604207
International Application Number:	
Confirmation Number:	8056
Title of Invention:	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS
First Named Inventor/Applicant Name:	FRANKLIN C. MARTI
Customer Number:	77356
Filer:	Paul Rusyn/Rosanne F Chow
Filer Authorized By:	Paul Rusyn
Attorney Docket Number:	2672-009-03
Receipt Date:	22-OCT-2009
Filing Date:	
Time Stamp:	18:03:30
Application Type:	Utility under 35 USC 111(a)

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RAM confirmation Number	4167
Deposit Account	071897
Authorized User	RUSYN,PAUL F
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

89

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2672-009-03_Application_as_filed_20091022.pdf	207653 27d3019231821eabadb9587684c99b1d011b246e	yes	45
Multipart Description/PDF files in .zip description					
	Document Description		Start	End	
	Specification		1	31	
	Claims		32	44	
	Abstract		45	45	

Warnings:**Information:**

2	Drawings-only black and white line drawings	2672-009-03_Formal_Figures_as_filed_20091022.pdf	497894 ca06620c9399f528cb06726d7a62454adde d16aa	no	13
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Warnings:**Information:**

3	Application Data Sheet	2672-009-03_ADS_20091022.pdf	1404602 6e2b3a8c5a0d196d1fe5434c7550dea5e56 49e27	no	5
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Warnings:**Information:**

4	Oath or Declaration filed	2672-009-03_Declaration_20091022.pdf	388454 aa39bf391454a439af935fd1d0070f3f16bb 4c5	no	1
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Warnings:**Information:**

5	Power of Attorney	2672-009-03_General_POA_20091022.pdf	517155 cd126bdc16e0ba84bd8579be8ed3dad9b1 ceaf8b	no	1
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Warnings:**Information:**

6	Information Disclosure Statement (IDS) Filed (SB/08)	2672-009-03_IDS_20091022.pdf	1025921 edc3008ca1f4b26edc4e6f7171803ece8cc9 105d	no	7
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Warnings:

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Information:					
7	Foreign Reference	JP2000113941A.pdf	379316 f15cd4b1806720425cca7faaf47bfe5abf22b7b8	no	6
Warnings:					
Information:					
8	Foreign Reference	WO2009039459A2.pdf	1315063 678d69777e05e06ac80d85d0de0516a1b70ddd9a	no	31
Warnings:					
Information:					
9	NPL Documents	ISR-WO2009039459A3.pdf	187815 502d751e8bd98cd737cc93db73ed6cc131b46f53	no	4
Warnings:					
Information:					
10	NPL Documents	WrittenOp-WO2009039459.pdf	170398 0c0ba735c78453efcb56fc67f819e9e3ca7ea3a	no	4
Warnings:					
Information:					
11	NPL Documents	US12234597.pdf	1292248 67cae7e19701b53a0e5ebeda2a96ce8c5f81a14c	no	37
Warnings:					
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12	NPL Documents	US12401587.pdf	2187438 5a593300cec9733c8ebab5f9a6df60c9ae6f8734	no	59
Warnings:					
Information:					
13	Fee Worksheet (PTO-875)	fee-info.pdf	38030 6536b22038ab3e657955ea9022bfd772f5157531	no	2
Warnings:					
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

**HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS,
SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN
COMMUNICATIONS SYSTEMS**

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PRIORITY CLAIM

[1] The present application is a Continuation-in-Part of co-pending United States Patent Application No. 12/234,597, filed September 19, 2008, which claims the benefit of United States Provisional Patent Application No. 60/973,675, filed September 19, 2007, now abandoned. The present application is also a Continuation-in-Part of co-
10 pending United States Patent Application No. 12/401,587, filed March 10, 2009. All of the foregoing applications are incorporated herein by reference in their entireties.

TECHNICAL FIELD

[2] The present invention relates generally to communications systems and,
15 more specifically, to high speed data communications connector circuits, systems, and methods for reducing the level of crosstalk in communications systems in which these circuits and methods are used.

BACKGROUND

20 [3] The speed of data communications networks has been increasing steadily and substantially over the past several decades, requiring newly designed components to enable the networks to operate at these new higher speeds. As the speed of networks increases, the frequency at which electrical signals are transmitted over communications

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channels in these networks likewise increases. As a result, electrically conductive paths within the communications channels of the network, which presented no problems at lower frequencies, can become antennae that broadcast and receive electromagnetic radiation and cause errors in the data being communicated. This unwanted coupling of signals from one electrically conductive path to another is known as "crosstalk" and degrades the overall performance of the network. Unwanted crosstalk can occur between any proximate electrically conductive paths that physically form parts of the network, such as individual pairs of physical wires within a given communications cable, between or among nearby communications cables, and within connectors used to connect communications cables to desired electronic components, such as routers and network switches, within the network.

[4] Figure 1 is a diagram illustrating a portion of a conventional communications network 100 including a typical communications channel 101. The channel 101 includes a communications outlet 102 into which a communications plug 104 of a cable 106 is inserted to thereby connect a first electronic subsystem 108, such as a computer system, to the communications network 100. The communications outlet 102 fits within an opening 110 of a wall plate 112 to expose an aperture 114 in the communications outlet into which the plug 104 is inserted. Electrical signals are then communicated to and from the computer system 108 through the cable 106, plug 104, outlet 102 and a cable 116. The cable 116 includes another communications outlet 118 on the other end of the cable, with the communications outlet 118 often being part of another network component such as a patch panel 120. A second electronic subsystem 122, such as a network switch or other network component, is connected to outlet 118

through a cable 124 and plug 126 to interconnect the communications channel 101 to other components in the network 100 as indicated by the arrow 127.

[5] The cables 106 and 116, plug 104 and 126, and outlets 102 and 118 are standardized components that include specified numbers of electrically conductive paths and a fixed configuration or arrangement of such paths within the plugs and outlets. Where the system 100 utilizes the Ethernet communications standard, for example, data is communicated through one or more twisted-pairs of conductive wires in the cables 106, 116. The plugs 104, 126 and outlets 102, 118 likewise include four corresponding pairs of electrically conductive elements or paths, such as in RJ45 outlets and plugs. For historical reasons, the physical arrangement of such electrically conductive paths within the plugs 104 and 126 is such that unwanted crosstalk is generated between pairs of electrically conductive paths. The outlets 102, 118, are designed in such a manner as to nullify the crosstalk generated by the plugs. As the speed at which data is communicated increases, so does the frequency range of operation for all components of the communications channel 101, making nullification of the unwanted crosstalk more difficult to achieve for reasons understood by those skilled in the art. This arrangement of electrically conductive paths within the plugs 104, 126 and outlets 102, 118 has nonetheless been retained even for current high-speed networks to provide compatibility between old and new network components.

[6] As the speed or frequency at which networks operate continues to increase, crosstalk can become significant and can interfere with the proper operation of the network 100. There are generally two types of crosstalk. The first type of crosstalk occurs among the pairs of electrically conductive paths within an individual communications channel 101 and is termed "internal crosstalk." Internal crosstalk is the

unwanted signals communicated from one pair to another within a single communications channel.

[7] The second type of crosstalk is known as "alien crosstalk" and occurs between or among pairs of electrically conductive paths in different communications channels 101. Alien crosstalk can be defined as unwanted signals communicated between pairs in different channels. Alien crosstalk can occur between most components of communications networks 100, and is particularly significant between those components which are physically located proximate to each other. For example, assume that nearby the cables 106, 116, plugs 104, 126, and outlets 102, 118 of the communications channel 101 of Figure 1, there are several additional similar communications channels (not shown) having corresponding components. This would typically be the case in the network 100. In this situation, alien crosstalk can occur between the communications channel 101 and the additional physically proximate communications channels.

[8] One particular type of alien crosstalk is known as "modal alien crosstalk" and is initiated by the unequal electrical exposures of some of the electrically conductive paths within the plugs 104, 126 to other comparable electrically conductive paths. These unequal electrical exposures result in a modal conversion of signals that causes unwanted electromagnetic waves of a different mode to propagate on electrically conductive paths in a given communications channel 101. These unwanted electromagnetic waves of a different mode can cause crosstalk in adjacent communications channels 101 that can interfere with the proper operation of such channels, particularly at the ever increasing frequencies at which networks operate. Since the outlets 102, 118 have conductors similarly arranged to those of the plug 104,

126 to be mechanically compatible, both the outlets and the plugs in a given channel cause modal conversion of signals. In addition, compensation circuitry used in the outlet to neutralize internal crosstalk can further add to the modal conversion of signals. Thus, both plugs and outlets contribute to the generation of modal alien crosstalk.

5 [9] There is a need for improved communications outlets designed to neutralize the modal conversion of signals initiated in the plug, reduce that generated in the outlet itself, and reduce internal crosstalk without significantly increasing the complexity of manufacturing the outlet or its cost.

10 SUMMARY

[10] According to one aspect of the present invention, a communications outlet includes a plurality of electrically conductive paths arranged in pairs and an electrically conductive shield. A plurality of conductive elements each connected to a corresponding conductive path and the conductive elements configured, for each pair, to
15 balance a capacitive coupling between the electrically conductive shield and the conductive paths of that pair. The electrically conductive shield may be floating, where a floating electrically conductive shield is understood by those skilled in the art to be a conductive shield that is not directly electrically connected to any other circuit or ground connection.

20 [11] According to another aspect of the present invention, a method of reducing alien crosstalk in a communications outlet having an electrically conductive shield and a plurality of electrically conductive paths arranged in pairs. The method includes, for each pair, connecting a conductive element to at least one of the

electrically conductive paths of the pair to balance a capacitive coupling between each of the electrically conductive paths of the pair and the electrically conductive shield.

[12] According to another aspect of the present invention, the floating electrically conductive shield, when used in combination with tines having electrical
5 crossovers as described in U.S. Patent No. 5,186,647, internal crosstalk cancellation on the rigid printed circuit board as described in U.S. Patent No. 6,379,157, modal alien crosstalk compensation on the rigid printed circuit board as described in U.S. Patent Application No. 12/401,587, and alien near end crosstalk ("ANEXT") cancellation by a snap-on connector isolation shield as described in U.S. Patent No. 7,273,396, enables
10 an outlet to perform to the desired level in meeting the cabling requirement standards for CAT6A.

BRIEF DESCRIPTION OF THE DRAWINGS

[13] Figure 1 is a diagram illustrating a portion of a conventional
15 communications network including a communications outlet.

[14] Figure 2 is a more detailed perspective view of a communications outlet including internal crosstalk, modal alien crosstalk, and alien crosstalk compensation stages according to one embodiment of the present invention.

[15] Figure 3 is a perspective view of the communications outlet of Figure 2
20 with the body removed to show in more detail possible locations of the internal crosstalk, modal alien crosstalk, and alien crosstalk compensation stages according to embodiments of the present invention.

[16] Figure 3A is another perspective view of the communications outlet of Figure 2 this time with the body attached but transparent to better illustrate the physical

positioning of the electrically conductive shield on the outer surface of the insulating body relative to various components within the outlet.

[17] Figure 3B is a cut-away perspective view of the communications outlet of Figure 3A showing in more detail the formation of the electrically conductive shield on the outer surface of the insulating body according to one embodiment of the present invention.

[18] Figure 4 is a schematic of the communications outlet of Figures 2 and 3 including the internal crosstalk, modal alien crosstalk, and alien crosstalk compensation stages according to one embodiment of the present invention.

[19] Figure 5 is a representative front view of the rigid printed circuit board of a first and second conventional communications outlet positioned side-by-side and contained within a conventional insulating body for each of these communications outlets.

[20] Figure 6 is a table illustrating the relative levels of power sum alien near end crosstalk (PSANEXT) between the pairs in the first and second communications outlets when the outlets are positioned as shown in Figure 5.

[21] Figure 7 is a table illustrating the levels of power sum alien near end crosstalk (PSANEXT) between the pairs in the first and second communications outlets when the position of the outlets is reversed relative to that shown in Figure 5.

[22] Figure 8 is a representative front view of the rigid printed circuit board of a first and second communications outlet positioned side-by-side and including an electrically conductive shield formed on the outer surface of the insulating body for each of the outlets.

[23] Figure 9 is a graph illustrating alien crosstalk levels as a function of frequency between pairs in two communications outlets in close proximity to each other that shows unwanted resonant peaks occurring at certain frequencies that cause the alien crosstalk to exceed desired limits.

5 [24] Figure 9A is a graph illustrating alien crosstalk levels as a function of frequency between pairs in two communications outlets in close proximity to each other without the unwanted resonant peaks.

[25] Figure 10 is a representative front view of the rigid printed circuit board of one of the communications outlets of Figure 8 that illustrates in more detail the capacitance between each of the insulation displacement connectors in one of the pairs and the electrically conductive shield formed on the outer surface of the insulating body.

10 [26] Figure 11 is a representative front view of the rigid printed circuit board in the communications outlet of Figures 2 and 3 illustrating in more detail coupling traces added on the rigid printed circuit board for selected conductive paths of the pairs.

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DETAILED DESCRIPTION

[27] Figures 2, 3, 3A, and 3B are perspective views of a communications outlet 200 including a system for high speed data transmission. According to embodiments of the present invention, the outlet 200 is a system comprised of a number of different components including: 1) an internal crosstalk compensation stage 205 including a flexible printed circuit board (PCB) physically and electrically connected to conductive outlet tines, a plurality of resilient, elongated spring members, crossover portions of selected pairs of the conductive outlet tine and a rigid printed circuit board; 2) a modal alien crosstalk compensation stage 207 placed on the flexible printed circuit board

and/or the rigid printed circuit board as described in more detail in U.S. Patent Application No. 12/401,587; and 3) an alien crosstalk compensation stage 209 including an electrically conductive floating shield portion and associated capacitive compensation portion, some aspects of which are described herein and some aspects of which are described in U.S. Patent No. 7,273,396 ("396 Patent"). In operation, the crosstalk compensation stages 205, 207 and 209 reduce internal, modal alien, and alien crosstalk levels in communications channels containing the communications outlet 200 as described in more detail below.

[28] Referring to Figure 2, the outlet 200 includes an insulating housing or body 201 having an electrically conductive shield 202 formed on at least a portion of the outer surface of the insulating body. The electrically conductive shield 202 is illustrated in more detail in subsequent Figures 3, 3A, and 3B and will be described in more detail with reference to these subsequent figures. The outlet 200 includes a plurality of resilient conductive outlet tines T1-T8 in parallel arrangement within an interior receptacle 203 of the body. Each of the outlet tines T1-T8 is illustrated in Figure 3 and several are also shown and labeled in Figure 2. Note that in the present description, when referring generally to any one of a number of similar components, such as the tines T1-T8, the number designation may be omitted, such as for the tines T. When referring to a specific one or ones of the components, such as tine T4, the number designation will be included. The receptacle 203 is formed in a front 204 of the body 201 and the outlet tines T1-T8 within the receptacle are connected to wire termination contacts 206 (see Figure 3) situated within a termination block 210 at a back 208 of the body. Wires within a cable (not shown) of a communications channel, such as the

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channel 101 of Figure 1, are then connected to the wire termination contacts 206, or otherwise electrically connected, as will be appreciated by those skilled in the art.

[29] Figure 3 is a perspective view of the communications outlet 200 of Figure 2 with the insulating body 201 removed to show in more detail the inner structure of the

5 outlet including the internal crosstalk compensation stage 205, modal alien crosstalk compensation stage 207, and alien crosstalk compensation stage 209 according to one embodiment of the present invention. The alien crosstalk compensation stage 209 is

formed by the combination of the electrically conductive shield 202 (not shown in Figure 3) and capacitive coupling traces CCT1-CCT4 formed on a rigid printed circuit

10 board 300 of the communications outlet 200, as described in more detail below. Two of the capacitive coupling traces, namely traces CCT3 and CCT4, are shown in Figure 3.

The wire termination contacts 206 are attached to the rigid printed circuit board 300, and each of the outlet tines T1-T8 has a fixed end 302 that is also attached to the printed

circuit board. Conductive traces CT1-CT8, generally designated as simply CT in Figure

15 3 (see Figure 4 for more detail), are formed on the printed circuit board 300 and interconnect the wire termination contacts 206 and fixed ends 302 of the tines T. The

capacitive coupling traces CCT1-CCT4 forming part of the alien crosstalk compensation stage 209 are also formed on the rigid printed circuit board 300 in the

embodiment of Figure 3 as previously mentioned. The tines T1-T8 include free ends

20 304 positioned proximate the front 204 (Figure 2) of the outlet 200. A contact point CP is shown and corresponds to a point where the tines of a plug (not shown) inserted in the

outlet 200 will contact the tines T1-T8 of the outlet. The outlet 200 further includes

nonconductive and resilient spring arms 306 positioned under the tines T1-T8 to support

the tines.

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[30] Figure 3A is another perspective view of the communications outlet 200 with the insulating body 201 attached as it would be when the communications outlet is assembled as in Figure 2. In contrast to Figure 2, however, in Figure 3A the insulating body 201 and electrically conductive shield 202 are transparent to better illustrate the physical positioning of the electrically conductive shield relative to the wire termination contacts 206 and capacitive coupling traces CCT1-CCT4 on the rigid circuit board 300. In the embodiment of Figure 3A, the electrically conductive shield 202 is formed on the outer surface of the body 201, as previously mentioned. Figure 3B is a cut-away perspective view of the communications outlet 200 of Figure 3A showing in more detail the formation of the electrically conductive shield 202 on the outer surface of the insulating body 201 according to one embodiment of the present invention. In this embodiment, the electrically conductive shield 202 is formed over the entire outer surface of the insulating body 201 and is floating, meaning the electrically conductive shield is not directly electrically connected to any component or connection within the outlet or to a ground connection. Instead, the floating electrically conductive shield 202 is capacitively coupled to components within the outlet 200, primarily the capacitive coupling traces CCT1-CCT4 and wire termination contacts 206, to form the alien crosstalk compensation stage 209. In other embodiments, the electrically conductive shield 202 is directly connected to circuitry within the outlet 200 or a system containing the outlet, such as a ground reference plane or connection.

[31] In the embodiment of Figures 3A and 3B the electrically conductive shield 202 is formed over the entire outer surface of the insulating body 201 to fully enclose the capacitive coupling traces CCT1-CCT4, rigid circuit board 300, tines T and other components within the outlet 200. The electrically conductive shield 202 is

NO1

formed over only a portion of the outer surface of the insulating body 201 in other embodiments. The electrically conductive shield 202 is formed from a suitable material, such as copper, aluminum, or other type of metal or other highly conductive material. In yet another embodiment, the electrically conductive shield 202 is
5 impregnated within the insulating body 201. Once again, the electrically conductive shield 202 may be contained over the entire body 201 to fully enclose capacitive coupling traces CCT1-CCT4, rigid circuit board 300, tines T and other components, or only over a portion or portions of the body to achieve the desired electrical characteristics.

10 [32] The electrically conductive shield 202 can be attached to the insulating body 201 in a variety of different ways. For example, as previously mentioned the electrically conductive shield 202 can be formed from an array of conductive fibers encased within the material, such as plastic, forming the insulating body 201. The electrically conductive shield 202 could alternatively be formed from a sheet, such as
15 a sheet of aluminum foil, adhered to the outer surface of the insulating body 201. Such a sheet can be glued, otherwise adhered, or otherwise affixed to the insulating body 201. Finally, in still other embodiments, the electrically conductive shield 202 is not formed in or on the insulating body 201 at all, but is instead formed on other components of the communications outlet 200 or on other separate structures (not
20 shown in Figures 3A and 3B) suitably positioned to achieve the desired electrical characteristics to reduce alien crosstalk with adjacent communications outlets.

[33] Figure 4 is a schematic of the communications outlet 200 of Figures 2, 3 and 3A, including the internal crosstalk, modal alien crosstalk and alien crosstalk compensation stages 205, 207 and 209, according to one embodiment of the present

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invention. Before discussing the operation of the crosstalk compensation stages 205, 207 and 209 in more detail, the schematic will first be discussed more generally and certain terms associated with the outlet 200 will be defined. The outlet 200 includes eight electrically conductive paths or conductors C1-C8. Each of the eight conductors

5 C1-C8 represents the corresponding conductive outlet line T1-T8, conductive traces CT1-CT8 on the rigid printed circuit board 300 and wire termination contacts 206. The eight conductors C1-C8 form four signal pairs P1-P4, with conductors C4 and C5 being pair P1, conductors C1 and C2 being pair P2, conductors C7 and C8 being pair P4 and conductors C3 and C6 being pair P3. Each pair P1-P4 of conductors C1-C8 carries a

10 corresponding electrical signal, as will be appreciated by those skilled in the art. Note that although the outlet 200 is shown, and will be described as including wire termination contacts 206 on the far right of Figure 4, the far right ends of each conductor C1-C8 more generally represent the points where a wire of a communications cable (not shown) connects to the conductor. Thus, although these are described herein

15 as being wire termination contacts 206, one skilled in the art will appreciate that other types of conductive contacts could also be utilized, such as terminals, bonding pads, soldering, vias or through holes and so on. The term wire termination contact is used herein to refer generally to all such types of conductive contacts.

[34] In Figure 4, the portions of the conductors C1-C8 on the left side of the

20 figure correspond to the outlet lines T1-T8 in the outlet 200 (Figure 3) that extend from the free ends 304 of the outlet lines on the far left to the fixed ends 302 of the outlet lines toward the middle of the figure. The portions of conductors C1-C8 on the right side of the figure represent the conductive traces CT1-CT8 and the wire termination contacts 206 that are situated on the rigid printed circuit board 300 towards the back of

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the outlet 200. The conductors C1 and C2 of pair P2, C4 and C5 of pair P1 and C7 and C8 of pair P4 "crossover" towards the front of the outlet 200, which is to the left side of Figure 4. More specifically, the tines T1 and T2 of pair P2, T4 and T5 of pair P1 and T7 and T8 of pair P4 "crossover." These crossovers of pairs P1, P2, and P4 reduce internal crosstalk within the outlet 200, where "internal crosstalk" is the crosstalk that occurs among the pairs P1-P4 of conductors C1-C8 within an individual outlet and communications channel 101 (Figure 1), as previously discussed. The crossovers of pairs P1, P2 and P4 thus constitute part of internal crosstalk compensation stage 205.

[35] The alien crosstalk compensation stage 209 is formed by the conductive shield 202 in combination with the capacitive coupling traces CCT associated with each pair P1-P4, two of which are shown in Figure 3. The conductive shield 202 is represented in Figure 4 as two lines at the top and bottom right of the schematic of Figure 4. The capacitance formed between conductive shield 202 and each capacitive coupling trace CCT is represented as a corresponding coupling capacitor CC1-CC4. Each coupling capacitor CC1-CC4 is associated with a particular pair P1-P4. The coupling capacitor CC1 is associated with pair P1, capacitor CC2 with pair P2, capacitor CC3 with pair P3 and capacitor CC4 with pair P4. More specifically, the coupling capacitor CC1 is formed by the conductive shield 202 and corresponding coupling trace CCT on rigid circuit board 300, where this coupling trace is connected to conductive trace CT5 of conductor C5 of pair P1. Similarly, the coupling capacitor CC2 is formed by the conductive shield 202 and corresponding coupling trace CCT on rigid circuit board 300, where this coupling trace is connected to conductive trace CT1 of conductor C1 of pair P2. The coupling capacitors CC3 and CC4 are formed by the conductive shield 202 and corresponding coupling traces CCT on rigid circuit board 300

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where these coupling traces are connected to conductive traces CT6, CT8 of conductors C6, C8 of pairs P3, P4. The coupling capacitors CC1-CC4 of the alien crosstalk compensation stage 209 reduce the susceptibility of the outlet 200, and thus the communications channel containing the outlet to alien crosstalk from proximate outlets and communications channels, as well as alien crosstalk generated by the outlet, as will be described in more detail below.

[36] The operation of each of the internal crosstalk compensation stages 205, modal alien crosstalk compensation stage 207 and alien crosstalk compensation stage 209 will now be discussed in more detail. It should be noted, however, that the modal alien crosstalk compensation stage 207 is described in detail in co-pending United States Patent Application Serial No. 12/401,587, filed March 10, 2009, and the present application is a continuation in part of the 12/401,587 application. The same is true for the internal crosstalk compensation stage 205 which is described in detail in co-pending United States Patent Application Serial No. 12/234,597, filed September 19, 2008, of which the present application is also a continuation in part. Because the internal crosstalk compensation stage 205 and modal alien crosstalk compensation stage 207 are described in detail in the 12/234,597 and 12/401,587 applications, respectively, these compensation stages will not again be described in detail herein, but instead these two compensation stages are described generally herein and reference can be made to these prior applications for additional details about the structure and operation of these stages.

[37] Turning now to the internal crosstalk compensation stage 205, this stage is formed on a flexible printed circuit board positioned under the tines T1-T8 as shown in Figure 3. More specifically, the flexible printed circuit board has fingers that are physically and electrically attached to the tines T3-T6 very near contact points CP

where the tines of a plug (not shown) inserted in the outlet 200 contact the tines T1-T8. In the present description the term "mated plug-outlet combination" may be utilized to mean an outlet with a plug inserted into that outlet. In operation, the internal crosstalk compensation stage 205 includes capacitive components that provide positive
5 compensation between pair P1 (tines T4, T5) and pair P3 (tines T3, T6), thereby reducing or compensating for a significant amount of internal crosstalk that may otherwise be generated within the outlet 200 such that the outlet and communications channels, including the outlet, meet required crosstalk levels at high frequencies such as those required for CAT6 and CAT6A outlets. This internal crosstalk is most prevalent
10 between pairs P1 and P3 due to the separation or "splitting" of the conductors C3 and C6 of pair 3, with pair P3 commonly referred to as the "split pair." The reasons for the presence of the split pair (i.e., using conductors C3 and C6 as pair P3) are historical and current outlets maintain this configuration for compatibility reasons.

[38] The internal crosstalk compensation stage 205 includes capacitive
15 components (not shown) formed on the flexible printed circuit board to provide the positive compensation between pairs P1 and P3 as described in greater detail U.S. Patent Application No. 12/234,597. The physical location of the flexible printed circuit board on which this portion of the internal crosstalk compensation stage 205 is formed provides a space saving solution to supply the required positive compensation. The
20 flexible printed circuit board also provides desirable mechanical support for the tines T3-T6 which, in turn, provides even spacing of these tines and eliminates the need for combs or other components to ensure proper spacing. The location of the flexible printed circuit board also allows the board to be installed by a machine during assembly of the outlet 200 and does not require hand installation.

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[39] Internal crosstalk compensation stage 205 also includes a second capacitive and inductive compensation stage created by time T crossover configurations as well as a third capacitive compensation stage on the rigid printed 300 that provides additional positive compensation between pairs P1 and P3. All three stages of internal compensation combine to form the internal crosstalk compensation stage 205 and work to further reduce internal crosstalk in the outlet 200 and thus in communications channels containing the outlet.

[40] Turning now to the modal alien crosstalk compensation stage 207, this stage includes a number of independent capacitive elements (shown generally in Fig. 3 but not in Figure 4) that function to introduce common mode signals onto the second and fourth pairs P2 and P4 of outlet tines T, and/or their associated circuit paths, responsive to signals on the conductors C3 and C6 of the split pair P3. The unequal electrical exposure of conductors C3, C6 of the split pair P3 in the plug of a mated plug-outlet combination would otherwise cause, at high frequencies, unwanted common mode signals to be induced or generated on both conductors C1, C2 of pair P2 and on both conductors C7, C8 of pair P4 in the plug and outlet 200. The independent capacitive elements of the modal alien crosstalk compensation stage 207 introduce common mode signals onto the conductors C1, C2 of pair P2, and conductors C7, C8 of pair P4, that tend to cancel or reduce the common mode signals on these pairs caused by the unequal electrical exposure of these pairs to the conductors C3, C6 of the split pair P3. In this way, the modal alien crosstalk compensation stage 207 reduces the modal alien crosstalk between and among adjacent communications channels including outlets 200.

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[41] In the embodiment of the outlet 200 illustrated through the schematic of Figure 4, the modal alien crosstalk compensation stage 207, and independent capacitive elements thereof, are shown as being formed on the rigid printed circuit board 300 previously described with reference to Figure 3. In another embodiment, the first modal
5 alien crosstalk compensation stage 207 and corresponding capacitive elements may be formed on the same flexible printed circuit board on which the internal crosstalk compensation stage 205 is formed.

[42] The modal alien crosstalk compensation stage 207 enables existing outlet structures to function satisfactorily at high frequencies, such as those required for CAT6
10 and CAT6A outlets, without requiring significant changes to the mechanical structure of the existing outlets. For example, no structural changes need be made to tines T3 and T6. Such changes, while they could be made to existing outlets to provide desired modal alien crosstalk compensation, complicate the mechanical structure of the outlet. A more complicated mechanical structure would typically make the outlet more
15 expensive to manufacture, less reliable, and reduce the usable life of the outlet.

[43] As will be appreciated by those skilled in the art, there are two standardized wiring conventions, T568A and T568B, for assigning pairs P to conductors C within the plug (e.g., plugs 104, 126 of Figure 1) and communications outlets (e.g.,
outlet 200). For all practical purposes, these two standardized wiring conventions
20 T568A, T568B are identical with the exception that the pairs P3 and P2 are interchanged. The T568B standardized wiring format is illustrated in Figure 4 and will be discussed in the present application although one skilled in the art will understand that the present invention and description thereof herein apply to the T568A convention

also, as well as to any other similar arrangement of wires independent of actual pair number assignments utilized.

[44] The structure and operation of the alien crosstalk compensation stage 209 will now be described in more detail. Figure 5 is a front view of first and second conventional communications outlets 500A and 500B positioned side-by-side. This view shows rigid printed circuit boards 502A, 502B contained within insulating bodies 504A, 504B for each of the communications outlets 500A, 500B. The pairs P1-P4 are labeled for each outlet 500A, 500B and, the wire termination contacts 506A, 506B, which are insulation displacement connectors (IDCs) in this example, are indicated for the pair P4 of the outlet 500A and the pair P3 for the outlet 500B. Also shown are through holes 508A and 508B in the rigid circuit boards 502A and 502B, respectively, through which the fixed ends (302 in Figure 3) of the times T (not shown) are positioned for each of the outlet 500A, 500B.

[45] When the communication outlets 500A, 500B are positioned proximate one another as shown in Figure 5, alien crosstalk, or more specifically alien near end crosstalk (ANEXT) and power sum ANEXT (PSANEXT), occurs between the outlets. These types of crosstalk are understood by those skilled in the art and are discussed in more detail in the 12/401,587 application. Accordingly, for the sake of brevity, the details of these types of alien crosstalk will not be described in detail herein. The large surface area of the IDCs 506A, 506B of the pairs P1-P4 of each outlet 500A, 500B results in a relatively strong coupling of signals on the IDCs of one outlet to adjacent IDCs of the adjacent outlet. The conductive traces CT (see Figure 3) on the rigid printed circuit boards 502A, 502B interconnecting the IDCs 506 and tines (not shown) also add to the level of PSANEXT between the outlets 500A, 500B. The same is true

for the capacitive components of the internal crosstalk compensation stage 205 (see Figure 4) where the internal crosstalk compensation stage can include a second stage time crossover and an additional third stage capacitive compensation formed on the rigid printed circuit boards 502A, 502B.

5 [46] Figure 6 is a table illustrating the relative levels of PSANEXT between the pairs P1-P4 in the first and second communications outlets 500A, 500B when the outlets are positioned as shown in Figure 5. As seen in the table of Figure 6, the strongest coupling occurs between pair P2 of outlet 500A and the pair P1 of outlet 500B as indicated by arrow 510 in Figure 5 and the term "HIGH" in the table. This is true
10 because, as seen in Figure 5, these two pairs P are positioned close together. The same strong level of coupling also occurs between pair P3 of outlet 500A and pair P4 of outlet 500B as seen in the table of Figure 6 and indicated by arrow 512 in Figure 5. The table shows that the coupling for most of the pairs P is not quite as strong, and is thus designated as medium or "MED," as that for the pairs P1 and pairs P4 in the outlets
15 500A, 500B. As seen Figure 5, these pairs are quite a bit farther apart than are those pairs P designated as having HIGH coupling. The table of Figure 6 also shows that four pairs P have the weakest coupling, designated "LOW," as that for the pair P4 of outlet 500A and pair P3 of outlet 500B. Referring to Figure 5, it is apparent these pairs are the farthest apart and thus exhibit the weakest coupling.

20 [47] Figure 7 is a table illustrating the relative levels of PSANEXT between the pairs P in the first and second communications outlets 500A, 500B when the positions of the outlets are reversed relative to that shown in Figure 5, where the outlet 500A is now to the right of the outlet 500B. Once again the table shows that in the majority of cases, the coupling between the pairs is medium MED, in two cases the

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coupling is strong or HIGH, and in four cases the coupling is weakest LOW. Note that the particular pairs P experiencing the medium, strong, and weakest coupling is different in the table of Figure 7 than the table of Figure 6 due to the relative repositioning of the outlets 500A, 500B for the two tables.

- 5 [48] The alien crosstalk between the communications outlets 500A and 500B of Figure 5 can be greatly reduced by placing respective conductive shields 800A, 800B around the insulating bodies 504A, 504B of the communications outlets 500A, 500B as shown in Figure 8. The insulating bodies 504 can be selectively plated with copper or other high conductivity material on the outer surface of the bodies, as previously
- 10 described for the insulating body 201 of Figures 2, 3 and 3A. As previously mentioned, the entire outer surface, or selected portions thereof needed for isolation, can be plated.
- [49] The utilization of the conductive shields 800 on the insulating bodies 504 can work well for many frequencies of operation for the outlets 500. In some cases, however, particularly as the frequency of operation increases, resonant frequencies can
- 15 arise at which signals can be generated on the conductive shields 800. This is true because the conductive shields 800 are floating (i.e., are not connected to any reference voltage of the circuit containing the outlets 500). The signals generated on the conductive shields 800 can, in turn, radiate from one shield to the next and, in this way, from one outlet 500 to the next causing increased levels of alien crosstalk at these
- 20 resonant frequencies. This is seen in the graph of Figure 9 which illustrates alien crosstalk levels in decibels as a function of frequency between the communications outlets 500A and 500B of Figure 8. This graph shows that at some frequencies, unwanted resonant peaks can occur causing the alien crosstalk to reach or exceed

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desired limits. A top line 900 in the graph represents the desired limit values and the lower lines represent the alien crosstalk on the pairs P1-P4 of the outlets 500.

[50] In addition to resonant peaks that occur due to the conductive shields 800 floating, each IDC 506 within a pair P in each outlet 500 sees an unequal level of coupling to the conductive shield 504. This is true because the effective coupling between each of the IDCs 506 in each pair P to the conductive shield 800 is dependent on its physical distance from the shield, and its surface area exposed to the shield, as illustrated in Figure 10. Figure 10 is a front view of one of the communications outlets 500A of Figure 8 that illustrates in more detail the distances between the conductive shield 800a and each of the IDCs 506A in the pair P2. Only the IDCs 506A of pair P2 are discussed in more detail with reference to Figure 10, but the same concepts apply to all IDCs and pairs P of the outlets 500A and 500B.

[51] The IDCs 506A of the pair P2 must see equal capacitive coupling to the conductive shield 800A for the differential signal across the IDCs of pair P2 to not generate a common mode signal on the conductive shield 800A. If such a common mode signal is generated on the conductive shield 800A, which is floating as previously described, a resonance condition can occur that causes undesired peaks in the levels of PSANEXT in the outlet 500A as previously discussed with reference to Figure 9. Both the IDCs 506A and the layout of the conductive traces CT (not shown) on the rigid printed circuit board 502A, and any crosstalk-related coupling capacitors on rigid printed circuit board, determine whether the outlet 500A will have such PSANEXT resonant peaks. The graph in Figure 9A is an example of good PSANEXT performance, meeting the required PSANEXT specification without resonant peaks and which can be achieved with communications outlets containing embodiments of the present invention.

A top line 1000 in the graph of Figure 9A represents desired limit values and the lower lines represent alien crosstalk on the pairs P1-P4 of the outlets 500A, 500B. The graph illustrates these crosstalk levels are well below the limit values corresponding to line 1000.

5 [52] For each of the IDCs 506A of the pair P2 to see the same capacitive coupling to the conductive shield 800A, the effective distance, comprised of the sum of the distances C and D, for a first one of the IDCs of the pair P2 must equal the sum of the effective distance, comprised of the sum of the distances A and B, for the other one of the IDCs of the pair P2. This is true because the value of a parallel-plate capacitor is given by $C = (\epsilon A / d)$ where ϵ is the permittivity of a dielectric between the parallel plates, A is the area of the plates, and d is the distance between the plates. The capacitance between the first one of the IDCs 506A and the conductive shield 800A can be written as $C_{IDC1} = (\epsilon A / (C + D))$ for some equivalent area A, while the capacitance between the second one of the IDCs 506A and the conductive shield can be written as $C_{IDC2} = (\epsilon A / (A + B))$ for some equivalent area A. In looking at Figure 10, it is seen that the sum C+D for the first one of the IDCs 506A will be greater than the distances A+B for the other one of the IDCs. To make the two equal, the effective distance defined by the values C and D must be decreased until $C + D = A + B$. The effective values of the distances C and D are decreased by adding the capacitive coupling trace CCT as shown in Figure 10.

[53] Figure 11 is a front view of the communications outlet 200 of Figures 2, 3 and 3A and illustrates in more detail the capacitive coupling traces CCT1-CTT4 added on the rigid printed circuit board 300 for selected conductors C. The capacitive coupling traces CCT1-CTT4 are added to balance the coupling of each IDC 206 in a

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given pair P with the conductive shield 202. Thus, for example, the capacitive coupling trace CCT2 is connected to the conductor C1 of the pair P2 to thereby balance the coupling of the corresponding IDC and the other IDC in pair P2 to the conductive shield 202. The same is done for each of the pairs P1, P3 and P4 with the corresponding capacitive coupling trace CCT1-CTT4 being connected to the appropriate conductor C and IDC 206. Note that although in the above description, the capacitive coupling between the IDCs and the conductive shield 202 is described as being balanced via the capacitive coupling traces CCT1-CCT4, it is the capacitive coupling between each electrically conductive path or conductor C, which includes the IDC 206 that is being balanced through the capacitive coupling traces. The distances A, B, C and D of Figure 10 are thus effective distances associated with each electrically conductive path C and the conductive shield 202. The capacitance of the IDCs 206 was previously discussed because most of the capacitive coupling to the conductive shield 202 would typically result from the IDCs due to the relatively large size and shape of the conductive plate portions of the IDCs.

[54] Once it is determined which IDC 206 of a pair P has the greatest coupling to the conductive shield 202 using the formula $C=(\epsilon A/d)$, the weakest coupling IDC in the pair P then needs to have the appropriate capacitive coupling trace CCT added. Each trace CCT will typically include a segment that runs parallel to the conductive shield 202, providing the required increased coupling for this conductor C and IDC 206 to balance it with the other conductor and IDC of the pair P. Each pair P may require a different amount of coupling based upon the other circuitry of the outlet 200 and the position of the conductive shield 202 relative to that pair P as is the case when the capacitive coupling traces CCT1-CCT4 are not identical for all the pairs P1-P4. The

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capacitive coupling traces CCT1-CCT4 for each pair P may be located on either side of the rigid printed circuit board or within the printed circuit board if more than two layers are used.

[55] The alien crosstalk compensation stage 209 formed by the capacitive coupling traces CCT1-CCT4 and conductive shield 202 greatly improves the ANEXT performance of the outlet 200 and eliminates, or greatly reduces, resonant peaks caused by the floating conductive shield 202. The capacitive coupling traces CCT1-CCT4 make the conductive shield 202 electrically neutral relative to each pair P so that little or no coupling occurs when another communications outlet is positioned proximate the communications outlet 200.

[56] In the above described embodiments, the conductive shield 202 is made electrically neutral relative to the conductors C of each pair P through the capacitive coupling traces CCT1-CCT4 formed on the rigid printed circuit board 300. In other embodiments, other "conductive elements" can be used in place of these capacitive coupling traces CCT1-CCT4 to electrically neutralize each pair P relative to the conductive shield 202. For example in another embodiment, instead of using the capacitive coupling traces CCT, one or both of the IDCs in each pair P, and/or the associated conductor C, is physically repositioned in such a way as to equalize the coupling of conductors of each pair to the floating shield. This repositioning could also include the angling of the surfaces of one or both of the IDCs of each pair P to the surfaces of the conductive shield 202. Unfortunately, because of the desired physical design characteristics of the communications outlet 200, the ability to reposition the IDCs is often substantially limited. An alternative to equalizing capacitive coupling to the conductive shield 202 through repositioning of the IDCs is a combination of some

change in IDC positioning in addition to the inclusion of capacitive coupling traces CCT.

[57] In yet another embodiment, conductive elements are formed on some of the IDCs to alter the geometry of at least some of the IDCs and thereby adjust the capacitive coupling of these IDCs to the conductive shield 202. For example, instead of repositioning the IDCs, conductive elements could be attached to some of the IDCs to adjust the capacitive coupling of these IDCs to the conductive shield 202 including, but not limited to, metallic projections clipped, soldered or otherwise attached to selected IDCs to adjust the capacitive coupling to the conductive shield as desired.

10 [58] In yet another embodiment, the conductive shield 202 is not formed in, or on, the insulating body 201 but is instead formed on other existing or new components in the communications outlet 200. In either case, the shield 202 is positioned to provide improved ANEXT performance. For example in another embodiment, the shield 202 or a portion thereof could be formed on the termination block 210 (see Figure 2). The shield 202 could also be formed from suitable planar conductive elements (not shown) attached along the edges of the rigid printed circuit board 300, each such planar conductive element extending parallel to a corresponding side of the body 201. Other embodiments are of course possible, with each embodiment suitably positioning the conductive shield 202 and adding conductive elements as necessary to approximately equalize the capacitive coupling of the conductors C in each pair P of the outlet 200 with the conductive shield. Moreover, although the embodiments described herein include eight conductive paths or conductors C, in other embodiments the outlet has fewer or more conductive paths C and pairs P.

[59] Referring back to Figure 3, the eight inline resilient conductive tines T are mechanically supported by the resilient non-conductive spring arms 306 as previously discussed with reference to Figure 3 and as described in more detail in U.S. Patent Nos. 6,641,443 and 6,786,776. The tines T are arranged within the outlet 200 in such a manner as to accept a mating RJ45 plug assembly which is not shown in any of the above-described figures but is understood by those skilled in the art. A first stage internal crosstalk compensation stage is located just above the point of contact CP for contacts or tines of the plug on the free ends 304 of the tines T. This first stage internal crosstalk compensation stage is formed on a flexible printed circuit board physically and electrically connected to the tines T proximate contact points CP as previously mentioned. More details of this stage are described in U.S. Patent Application No. 12/234,597 as well as related U.S. Patent Nos. 6,464,541 and 6,139,371.

[60] After the point of contact CP, the tines T have electrical crossovers on pairs P2, P4 and the split pair P3 located between the contact point and the rigid circuit board 300 as shown in, and previously described with reference to, Figure 4. These crossovers further reduce high-frequency internal crosstalk, as described in more detail in U.S. Patent No. 5,186,647, by swapping the positioning of tip/ring polarity of a pair P to reduce coupling to an adjacent pair where one of the conductors C in each pair is commonly referred to as a "tip" conductor and the other as a "ring" conductor.

[61] Additional internal crosstalk cancellation is located on the rigid printed circuit board 300 near the base or fixed ends 302 of the tines T. This additional stage works together with the tine crossovers and first stage capacitive compensation to complete the overall internal crosstalk compensation of the outlet 200 and is described in more detail in U.S. Patent 6,379,157.

[62] Due to the nature of the arrangement of the tines T to include the split pair P3, modal alien crosstalk begins to occur at the mated plug/outlet assembly and is then generated throughout the communications channel including the outlet 200. The rigid printed circuit board 300 corrects this problem by providing modal crosstalk compensation at the base or fixed ends 302 of the tines T through opposite polarity capacitive compensation as described in more detail in U.S. Patent Application No. 12/401,587. Additional internal NEXT cancellation circuitry is combined on the same rigid printed circuit board 300 while at the same time providing signal paths to the wire termination contacts 206 (IDCs in the illustrated embodiments) end of the outlet 200 at the cable entry point of the outlet.

[63] Finally, there is ANEXT cancellation provided by both the floating conductive shield 202 on the body 201 and by a snap-on connector isolation shield at the IDC-end of the outlet 200, as described in more detail in U.S. Patent No. 7,273,396. Referring back to Figures 3 and 4, the snap-on connector isolation shield is attached to (i.e., "snaps on") the IDC-end of the outlet 200 and is part of the alien crosstalk compensation stage 209. When included, the snap-on connector isolation shield functions in combination with the floating conductive shield 202 to reduce alien crosstalk levels in communications channels containing communications outlet 200. While the floating conductive shield 202 provides isolation to adjacent outlets 200 within a panel arrangement, a new challenge of unbalanced signal paths occurs caused, primarily, by the offset IDC arrangement of each outlet 200 and, secondarily, by the printed circuit board layout for a given pair P in relation to the floating conductive shield. By providing capacitive coupling compensation on the rigid printed circuit board to electrically balance out each differential pair P relative to the floating

conductive shield 202, ANEXT is reduced with minimal resonant frequency spikes within the operating frequency range.

[64] When combined, all these compensation stage subcomponents of the communications outlet 200 work together to enable the outlet to perform to the desired level to meet the cabling requirement standards for CAT6A.

[65] Communications outlets 200 can be included in a variety of different types of electronic systems such as the communications network 100 of Figure 1. The network 100 would typically include many communications channels 101, each channel interconnecting components such as the computer system 108 and network switch 122.

Moreover, the computer system 108 and network switch 122 are just examples of components that can be connected to communications channels 101. A wide variety of electronic subsystems may be connected to respective communications channels 101 in lieu of the computer system 108 and switch 122. For example, the first electronic subsystem 108 could be a local area network (LAN) including a plurality of computers. Also, although the communication outlet 200 is discussed as being an RJ45 outlet in the present description, those skilled in the art will realize that the present invention may be utilized in other types of communications outlets as well, such as ARJ45 outlets, non-RJ type outlets like GG45 and TERA outlets, as well other communications outlets, whether or not associated with particular standards or proprietary formats.

[66] A more detailed description of the various types of crosstalk discussed in the present application, namely internal, modal alien, and alien crosstalk, along with a more general discussion of crosstalk, is provided in the 12/234,597 application. One skilled in the art, however, will understand the meaning of these terms and thus they have not again been described in detail herein.

[67] Note that although the term “rigid” is used to describe the circuit board 300 in the outlet 200 of Figures 3 and 3A, the use of this term is not intended to mean that the circuit board 300 has some additional rigidity beyond that of a conventional circuit board. Instead, the term is used merely to mean that the circuit board 300 must be sufficiently rigid to perform its desired function and that the circuit board 300 is “rigid” relative to the flexible printed circuit on which the internal crosstalk compensation stage 205 is formed in the embodiment of Figure 3. Thus, the term “rigid” is used primarily to contrast the rigidity of the circuit board 300 relative to the rigidity of the flexible printed circuit board.

10 [68] Even though various embodiments and advantages of the present invention have been set forth in the foregoing description, the above disclosure is illustrative only, and changes may be made in detail and yet remain within the broad principles of the present invention. Therefore, the present invention is to be limited only by the appended claims. Furthermore in the present description, certain details
15 have been set forth in conjunction with the described embodiments of the present invention to provide a sufficient understanding of the invention. One skilled in the art will appreciate, however, that the invention itself and various aspects thereof may be practiced without these particular details. Furthermore, one skilled in the art will appreciate that the sample embodiments described do not limit the scope of the present
20 invention and various modifications, equivalents and combinations of the disclosed embodiments and components of such embodiments are within the scope of the present invention. Embodiments including fewer than all the components of any of the respective described embodiments may also be within the scope of the present invention although not expressly described in detail herein. Finally, the operation or structure of

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PATENT APPLICATION
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well known components and/or processes has not been shown or described in detail herein to avoid unnecessarily obscuring the present invention.

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REIVINDICACIONES

1. Una toma de salida de comunicaciones, caracterizada porque comprende:

una pluralidad de trayectorias eléctricamente
5 conductoras configuradas en pares;

un blindaje eléctricamente conductor; y

una pluralidad de elementos conductores, conectándose
cada elemento conductor a una trayectoria conductora
correspondiente y configurándose los elementos conductores,
10 para cada par, a fin de equilibrar un acoplamiento capacitivo
entre el blindaje eléctricamente conductor y las trayectorias
conductoras de ese par.

2. La toma de salidas de comunicaciones según la
reivindicación 1, caracterizada porque el blindaje
15 eléctricamente conductor comprende un blindaje flotante
eléctricamente conductor.

3. La toma de salida de comunicaciones según la
reivindicación 1, caracterizada además porque comprende:

un cuerpo aislante; y

20 donde el blindaje eléctricamente conductor se forma
en o sobre el cuerpo aislante.

4. La toma de salida de comunicaciones según la
reivindicación 3, caracterizada porque el cuerpo aislante
incluye una superficie y porque el blindaje eléctricamente
25 conductor se forma sobre al menos una porción de la superficie.

5. La toma de salida de comunicaciones según la
reivindicación 4, caracterizada además porque la superficie es
una superficie exterior del cuerpo aislante.

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6. La toma de salida de comunicaciones según la reivindicación 1, caracterizada además porque comprende:

una tarjeta de circuito impreso rígida; y

porque los elementos conductores corresponden a
5 segmentos conductores formados en la tarjeta de circuito impreso rígida.

7. La toma de salida de comunicaciones según la reivindicación 1, caracterizada además porque comprende:

una tarjeta de circuito impreso rígida;

10 contactos de terminación de alambres conectados a la tarjeta de circuito impreso rígida; y

porque los contactos de terminación de alambres se colocan con relación al blindaje eléctricamente conductor para formar los elementos conductores.

15 8. La toma de salida de comunicaciones según la reivindicación 7, caracterizada además porque comprende segmentos conductores formados en la tarjeta de circuito impreso rígida, formando estos segmentos conductores y los
20 contactos de terminación de alambres colectivamente a los elementos conductores que equilibran el acoplamiento capacitivo entre el blindaje eléctricamente conductor y las trayectorias conductoras de cada par.

9. La toma de salida de comunicaciones según la reivindicación 8, caracterizada porque al menos algunos de los
25 contactos de terminación de alambres son conectores de desplazamiento de aislamiento.

10. La toma de salida de comunicaciones según la reivindicación 1, caracterizada además porque comprende:

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una tarjeta de circuito impreso rígida; y

contactos de terminación de alambres conectados a la tarjeta de circuito impresa rígida, conectándose los elementos conductores a o formados como parte de los contactos de terminación de alambres.

11. La toma de salida de comunicaciones según la reivindicación 1, caracterizada porque la toma de salida de comunicaciones comprende una de entre una toma de salida RJ45 y una toma de salida ARJ45.

10 12. Una toma de salida de comunicaciones, caracterizada porque comprende:

un cuerpo aislante que tiene una superficie;

un blindaje eléctricamente conductor formado sobre al menos una porción de la superficie del cuerpo aislante;

15 una pluralidad de contactos de terminación de alambres; y

una tarjeta de circuito impreso rígida configurada para colocarse dentro del alojamiento, incluyendo la tarjeta de circuito impreso rígida una pluralidad de segmentos conductores y conectándose los contactos de terminación de alambres a la tarjeta de circuito rígido y acoplados eléctricamente a los segmentos conductores, siendo parte los segmentos conductores en la tarjeta de circuito impreso rígida y los contactos de terminación de alambres de una pluralidad de trayectorias eléctricamente conductoras de la toma de salida de comunicaciones, definiéndose pares de la trayectoria selectivamente conductoras e incluyendo la tarjeta de circuito impreso rígida para cada par un segmento de acoplamiento

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capacitivo conectado eléctricamente a una de las trayectorias eléctricamente conductoras del par, configurado cada segmento de acoplamiento capacitivo en la tarjeta de circuito impreso rígida para equilibrar un acoplamiento capacitivo entre el
5 blindaje conductor y las trayectorias eléctricamente conductoras del par asociado.

13. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque el blindaje eléctricamente conductor comprende un blindaje flotante
10 eléctricamente conductor que no se conecta eléctricamente directamente a ningún circuito de conexión a tierra.

14. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque al menos algunos de los contactos de terminación de alambres son conectores de
15 desplazamiento de aislamiento.

15. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque la superficie del cuerpo aislante es una superficie exterior.

16. La toma de salida de comunicaciones según la reivindicación 15, caracterizada porque el blindaje eléctricamente conductor se forma sobre toda la superficie exterior del cuerpo aislante.

17. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque la toma de salida
25 comprende una de entre una toma de salida RJ45 y una toma de salida ARJ45.

18. La toma de salida de comunicaciones según la reivindicación 12, caracterizada además porque comprende un

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bloque de terminación configurado para alojar los contactos de terminación de alambres y conectarse al cuerpo aislante.

19. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque el blindaje
5 eléctricamente conductor comprende un blindaje metálico.

20. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque

cada una de las trayectorias eléctricamente conductoras incluye una punta eléctricamente conductora, y

10 la toma de salida de comunicaciones comprende además una primera etapa de compensación de interferencia interna entre canales formada en una tarjeta de circuito impreso flexible conectada al menos a algunas de las puntas.

21. La toma de salida de comunicaciones según la
15 reivindicación 12, caracterizada además porque comprende una primera etapa de compensación de interferencia interna entre canales formada a través de los cruces de las puntas de los padres seleccionados de las trayectorias eléctricamente conductoras.

20 22. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque

cada una de las trayectorias eléctricamente conductoras incluye una punta eléctricamente conductora, y

la toma de salida de comunicaciones comprende además
25 brazos de resorte elásticos y no conductores conectados a la tarjeta de circuito impreso rígida y colocados bajo las puntas a fin de proporcionar soporte mecánico a las puntas.

23. La toma de salida de comunicaciones según la

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reivindicación 12, caracterizada además porque comprende una primera etapa de compensación de interferencia interna entre canales formada mediante los segmentos conductores en la tarjeta de circuito impreso rígida.

5 24. La toma de salida de comunicaciones según la reivindicación 12, caracterizada además porque comprende una etapa de compensación de interferencia duplicada entre canales.

10 25. La toma de salida de comunicaciones según la reivindicación 24, caracterizada porque la etapa de compensación de interferencia duplicada entre canales incluye una etapa de compensación de interferencia duplicada modal entre canales formada en la tarjeta de circuito impreso rígida.

 26. La toma de salida de comunicaciones según la reivindicación 24, caracterizada porque

15 cada una de las trayectorias eléctricamente conductoras incluye una punta eléctricamente conductora, y

 la etapa de compensación de interferencia duplicada entre canales incluye una etapa de compensación de interferencia duplicada modal entre canales formada en una
20 tarjeta de circuito impreso flexible conectada a las puntas seleccionadas.

 27. La toma de salida de comunicaciones según la reivindicación 24, caracterizada porque

 cada una de las trayectorias eléctricamente
25 conductoras incluye una punta eléctricamente conductora,

 la etapa de compensación de interferencia duplicada entre canales incluye una primera etapa de compensación de interferencia duplicada modal entre canales formada en una

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tarjeta de circuito impreso flexible conectada a las puntas seleccionadas, y

la etapa de compensación de interferencia duplicada entre canales incluye una segunda etapa de compensación de interferencia duplicada modal entre canales formada en la tarjeta de circuito impreso rígida.

28. La toma de salida de comunicaciones según la reivindicación 24, caracterizada porque la etapa de compensación de interferencia duplicada entre canales incluye además una estructura de blindaje de aislamiento de conector de broche de presión conectada al extremo de la toma de salida de comunicaciones donde se encuentran ubicados los contactos de terminación de alambres y operativos para reducir los niveles de interferencia duplicada entre canales en los canales de comunicación que contienen la toma de salida de comunicaciones.

29. La toma de salida de comunicaciones según la reivindicación 12, caracterizada porque cada una de las trayectorias eléctricamente conductoras incluye una punta eléctricamente conductora y porque la toma de salida de comunicaciones comprende además:

una primera etapa de compensación de interferencia interna entre canales formada en una tarjeta de circuito impreso flexible conectada a las puntas;

una segunda etapa de compensación de interferencia interna entre canales formada a través de los cruces de las puntas de pares seleccionados de trayectorias eléctricamente conductoras;

una tercera etapa de compensación de interferencia

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interna entre canales formada en la tarjeta de circuito impreso rígida;

una etapa de compensación de interferencia duplicada modal entre canales; y

5 una etapa de compensación de interferencia duplicada entre canales que incluye una estructura de blindaje de aislamiento de conector de broche de presión conectada al extremo de la toma de salida de comunicaciones donde se encuentran ubicados los contactos de terminación de alambres y
10 son operativos para reducir los niveles de interferencia duplicada entre canales en canales de comunicación que incluyen la salida de comunicaciones.

30. La toma de salida de comunicaciones según la reivindicación 29, caracterizada porque la etapa de
15 compensación de interferencia duplicada modal entre canales incluye una primera etapa formada en la tarjeta de circuito impreso flexible.

31. La toma de salida de comunicaciones según la reivindicación 30, caracterizada porque la etapa de
20 compensación de interferencia duplicada modal entre canales incluye una segunda etapa formada en la tarjeta de circuito impreso rígida.

32. Un método para reducir la interferencia duplicada entre canales una toma de salida de comunicaciones
25 que tiene un primer blindaje eléctricamente conductor una pluralidad de trayectorias eléctricamente conductoras configuradas en pares, caracterizado el método porque comprende, para cada par, conectar un elemento conductor al

menos a una de las trayectorias eléctricamente conductoras del par a fin de equilibrar un acoplamiento capacitivo entre cada una de las trayectorias eléctricamente conductoras del par y el blindaje eléctricamente conductor.

5 33. El método según la reivindicación 32, caracterizado porque se añade un elemento conductor únicamente a una de las trayectorias eléctricamente conductoras en cada par.

10 34. El método según la reivindicación 32, caracterizado porque conectar un elemento conductor al menos a una de las trayectorias eléctricamente conductoras del comprende formar segmentos de acoplamiento capacitivo en una tarjeta de circuito impreso rígida.

15 35. El método según la reivindicación 32, caracterizado además porque comprende reducir la interferencia interna entre canales generada en la toma de salida de comunicaciones.

20 36. El método según la reivindicación 35, caracterizado además porque comprende reducir la generación de interferencia duplicada modal entre canales de la toma de salida de comunicaciones.

25 37. El método según la reivindicación 36, caracterizado además porque comprende proporcionar una segunda estructura de blindaje eléctricamente conductora colocada adyacente a los contactos de terminación de alambres de la toma de salida de comunicaciones.

38. El método según la reivindicación 32, caracterizado porque el método comprende además aislar

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eléctricamente al blindaje eléctricamente conductor de manera que no haya una conexión eléctrica directa entre el blindaje eléctricamente conductor y la trayectoria eléctricamente conductora y otra circuitería en la toma de salida de comunicaciones.

39. El método según la reivindicación 32, caracterizado porque cada una de las trayectorias eléctricamente conductoras incluye una punta y porque el método comprende además proporcionar desde debajo de las puntas la fuerza para soportar mecánicamente las puntas.

40. Una toma de salida de comunicaciones que incluye un cuerpo aislante y una pluralidad de trayectorias conductoras, incluyendo cada trayectoria conductora una punta de toma de salida correspondiente colocándose las puntas de la toma de salida adyacentes una a otra, teniendo cada punta de toma de salida un extremo libre cerca del cual se adapta un contrato de enchufe para tocar la punta de toma de salida, y teniendo cada punta de toma de salida un extremo fijo conectado a una tarjeta de circuito impreso rígida y acoplada a través de un segmento conductor correspondiente en la tarjeta de circuito impreso rígida a un contacto de terminación de alambres correspondiente, caracterizado la toma de salida de comunicaciones porque comprende:

una etapa de compensación de interferencia interna entre canales acoplada al menos a algunas de las trayectorias conductoras y operativa para reducir la interferencia interna entre canales dentro de la toma de salida de comunicaciones;

una primera etapa de compensación de interferencia

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duplicada modal entre canales conectada al menos a algunas de las trayectorias conductoras y operativa para reducir la interferencia duplicada modal entre canales generada dentro de la toma de salida de comunicaciones; y

5 una etapa de compensación de interferencia duplicada entre canales, que comprende:

un blindaje eléctricamente conductor; y

una pluralidad de elementos conductores, conectándose cada elemento conductor una trayectoria conductora correspondiente y configurándose los elementos conductores, para cada par de señales, a fin de equilibrar un acoplamiento capacitivo entre el blindaje eléctricamente conductor y las trayectorias conductoras de ese par de señales.

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15 41. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la etapa de compensación de interferencia duplicada entre canales comprende además una estructura de blindaje de aislamiento de conector de broche de presión conectada hacia el extremo de la toma de salida de comunicaciones donde se encuentran ubicados los contactos de terminación de alambres.

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42. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la etapa de compensación de interferencia interna entre canales incluye una primera porción formada a través del cruce de las puntas de padres seleccionados.

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43. La toma de salida de comunicaciones según la reivindicación 41, caracterizada porque la compensación de

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interferencia interna entre canales incluye además una segunda porción formada en la tarjeta de circuito impreso rígida.

44. La toma de salida de comunicaciones según la reivindicación 43, caracterizada porque La compensación de
5 interferencia interna entre canales incluye además una tercera porción formada en una tarjeta de circuito impreso flexible conectada a las puntas seleccionadas.

45. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque al menos algunos de los
10 contactos de terminación de alambres son conectores de desplazamiento de aislamiento.

46. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la toma de salida de comunicaciones comprende además un cuerpo aislante que tiene
15 una superficie exterior y porque el blindaje eléctricamente conductor se forma sobre toda la superficie exterior del cuerpo aislante.

47. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la toma de salida de
20 comunicaciones comprende una de entre una toma de salida RJ45 y una toma de salida de ARJ45.

48. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la etapa de compensación de interferencia duplicada modal entre canales se
25 forma en una tarjeta de circuito impreso flexible conectada a las puntas.

49. La toma de salida de comunicaciones según la reivindicación 40, caracterizada porque la etapa de

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compensación de interferencia duplicada modal entre canales se forma en la tarjeta de circuito impreso rígida.

50. La toma de salida de comunicaciones según la reivindicación 40, caracterizada además porque comprende brazos
5 de resorte elásticos y no conductores conectados a la tarjeta de circuito impreso rígida y colocados debajo de las puntas para proporcionar soporte mecánico a las puntas.

51. Un sistema electrónico, caracterizado porque comprende:

10 un primer subsistema electrónico;

una primera pluralidad de cables de comunicación acoplados al primer subsistema electrónico, incluyendo cada cable un enchufe de comunicaciones correspondientes;

una pluralidad de tomas de salida de comunicaciones,
15 adaptada a cada toma de salida de comunicaciones para recibir uno de los enchufes de comunicaciones correspondientes, y al menos algunas de las tomas de salida de comunicaciones que comprenden,

una pluralidad de trayectorias eléctricamente
20 conductoras configuradas en pares;

un blindaje eléctricamente conductor; y

una pluralidad de elementos conductores, conectándose cada elemento conductor a una trayectoria conductora correspondiente y configurándose los elementos
25 conductores, para cada par, a fin de equilibrar un acoplamiento capacitivo entre el blindaje eléctricamente conductor y las trayectorias conductoras de ese par;

una segunda pluralidad de cables de comunicación

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acoplados a la pluralidad de tomas de salida de comunicación; y
un segundo subsistema electrónico acoplado a la
segunda pluralidad de cables de comunicación.

52. El sistema electrónico según la reivindicación
5 51, caracterizado porque los subsistemas electrónicos primero y
segundo comprenden redes de cómputo.

53. El sistema electrónico según la reivindicación
51, caracterizado porque al menos algunas de las tomas de
salida de comunicaciones comprenden una de entre una toma de
10 salida RJ45 y una toma de salida ARJ45.

54. El sistema electrónico según la reivindicación
51, caracterizado porque el blindaje eléctricamente conductor
es flotante con relación a las trayectorias eléctricamente
conductoras, elementos conductores y otros componentes
15 eléctricos en el sistema electrónico.

55. El sistema electrónico según la reivindicación
51, caracterizado porque cada una de las trayectorias
eléctricamente conductoras incluye una punta eléctricamente
conductora y porque al menos algunas de las tomas de salida de
20 comunicaciones comprenden además:

una primera etapa de compensación de interferencia
interna entre canales formada en una tarjeta de circuito
impreso flexible conectada a las puntas;

una segunda etapa de compensación de interferencia
25 interna entre canales formada a través de los cruces de las
puntas de los pares seleccionados de las trayectorias
eléctricamente conductoras;

una tercera etapa de compensación de interferencia

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interna entre canales formada en la tarjeta de circuito impreso rígida;

una etapa de compensación de interferencia duplicada modal entre canales; y

5 una etapa de compensación de interferencia duplicada entre canales que incluye una estructura de blindaje de aislamiento de conector de broche de presión conectada al extremo de la toma de salida de comunicaciones donde se encuentran ubicados los contactos de terminación de alambres y
10 operativa para reducir los niveles de interferencia duplicada entre canales en los canales de comunicación que contienen la toma de salida de comunicaciones.

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CLAIMS

What is claimed is:

1. A communications outlet, comprising:

a plurality of electrically conductive paths arranged in pairs;

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an electrically conductive shield; and

a plurality of conductive elements, each conductive element being connected to a corresponding conductive path and the conductive elements being configured, for each pair, to balance a capacitive coupling between the electrically conductive shield and the conductive paths of that pair.

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2. The communications outlet of claim 1 wherein the electrically conductive shield comprises a floating electrically conductive shield.

3. The communications outlet of claim 1 further comprising:
an insulating body; and

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wherein the electrically conductive shield is formed in or on the insulating body.

4. The communications outlet of claim 3 wherein the insulating body includes a surface and wherein the electrically conductive shield is formed on at least a portion of the surface.

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5. The communications outlet of claim 4 wherein the surface is an outer surface of the insulating body.

6. The communications outlet of claim 1 further comprising:
a rigid printed circuit board; and
5 wherein the conductive elements correspond to conductive traces formed on the rigid printed circuit board.

7. The communications outlet of claim 1 further comprising:
a rigid printed circuit board;
wire termination contacts connected to the rigid printed circuit board; and
10 wherein the wire termination contacts are positioned relative to the electrically conductive shield to form the conductive elements.

8. The communications outlet of claim 7 further comprising conductive traces formed on the rigid printed circuit board, these conductive traces and the wire termination contacts collectively forming the conductive elements that balance
15 the capacitive coupling between the electrically conductive shield and the conductive paths of each pair.

9. The communications outlet of claim 8 wherein at least some of the wire termination contacts are insulation displacement connectors.

10. The communications outlet of claim 1 further comprising:
20 a rigid printed circuit board; and

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wire termination contacts connected to the rigid printed circuit board, the conductive elements being attached to or formed as a part of the wire termination contacts.

11. The communications outlet of claim 1 wherein the
5 communications outlet comprises one of an RJ45 outlet and an ARJ45 outlet.

12. A communications outlet, comprising:
an insulating body having a surface;
an electrically conductive shield formed on at least a portion of the surface
of the insulating body;
10 a plurality of wire termination contacts; and
a rigid printed circuit board configured to be positioned within the
housing, the rigid printed circuit board including a plurality of conductive traces and the
wire termination contacts being attached to the rigid circuit board and electrically
coupled to the conductive traces, the conductive traces on the rigid printed circuit board
15 and the wire termination contacts being part of a plurality of electrically conductive
paths of the communications outlet, with pairs of the electrically conductive paths being
defined and the rigid printed circuit board including for each pair a capacitive coupling
trace electrically connected to one of the electrically conductive paths of the pair, each
capacitive coupling trace configured on the rigid printed circuit board to balance a
20 capacitive coupling between the conductive shield and the electrically conductive paths
of the associated pair.

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13. The communications outlet of claim 12 wherein the electrically conductive shield comprises a floating electrically conductive shield that is not directly electrically connected to any circuit or ground connection.

14. The communications outlet of claim 12 wherein at least
5 some of the wire termination contacts are insulation displacement connectors.

15. The communications outlet of claim 12 wherein the surface of the insulating body is an outer surface.

16. The communications outlet of claim 15 wherein the electrically conductive shield is formed over the entire outer surface of the insulating
10 body.

17. The communications outlet of claim 12 wherein the outlet comprises one of an RJ45 outlet and an ARJ45 outlet.

18. The communications outlet of claim 12 further comprising a termination block configured to house the wire termination contacts and attach to the
15 insulating body.

19. The communications outlet of claim 12 wherein the electrically conductive shield comprises a metallic shield.

20. The communications outlet of claim 12,

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wherein each of the electrically conductive paths includes an electrically conductive tine, and

wherein the communications outlet further comprises a first internal crosstalk compensation stage formed on a flexible printed circuit board attached to at
5 least some of the tines.

21. The communications outlet of claim 12 further comprising a first internal crosstalk compensation stage formed through crossovers of the tines of selected pairs of electrically conductive paths.

22. The communications outlet of claim 12,
10 wherein each of the electrically conductive paths includes an electrically conductive tine, and

wherein the communications outlet further comprises nonconductive and resilient spring arms connected to the rigid printed circuit board and positioned under the tines to provide mechanical support to the tines.

23. The communications outlet of claim 12 further comprising a first internal crosstalk compensation stage formed via conductive traces on the rigid printed circuit board.
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24. The communications outlet of claim 12 further comprising an alien crosstalk compensation stage.

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25. The communications outlet of claim 24 wherein the alien crosstalk compensation stage includes a modal alien crosstalk compensation stage formed on the rigid printed circuit board.

26. The communications outlet of claim 24,
5 wherein each of the electrically conductive paths includes an electrically conductive tine, and
wherein the alien crosstalk compensation stage includes a modal alien crosstalk compensation stage formed on a flexible printed circuit board attached to selected ones of the tines.

10 27. The communications outlet of claim 24,
wherein each of the electrically conductive paths includes an electrically conductive tine,
wherein the alien crosstalk compensation stage includes a first modal alien crosstalk compensation stage formed on a flexible printed circuit board attached to
15 selected ones of the tines, and
wherein the alien crosstalk compensation stage includes a second modal alien crosstalk compensation stage formed on the rigid printed circuit board.

28. The communications outlet of claim 24 wherein the alien crosstalk compensation stage further includes a snap-on connector isolation shield
20 structure attached to the end of the communications outlet where the wire termination contacts are located and operable to reduce alien crosstalk levels in communications channels containing the communications outlet.

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29. The communications outlet of claim 12 wherein each of the electrically conductive paths includes an electrically conductive tine and wherein the communications outlet further comprises:

5 a first internal crosstalk compensation stage formed on a flexible printed circuit board attached to the tines;

a second internal crosstalk compensation stage formed through crossovers of the tines of selected pairs of electrically conductive paths;

a third internal crosstalk compensation stage formed on the rigid printed circuit board;

10 a modal alien crosstalk compensation stage; and

an alien crosstalk compensation stage including a snap-on connector isolation shield structure attached to the end of the communications outlet where the wire termination contacts are located and operable to reduce alien crosstalk levels in communications channels containing the communications outlet.

15 30. The communications outlet of claim 29 wherein the modal alien crosstalk compensation stage includes a first stage formed on the flexible printed circuit board.

31. The communications outlet of claim 30 wherein the modal alien crosstalk compensation stage includes a second stage formed on the rigid printed circuit board.

32. A method of reducing alien crosstalk in a communications outlet having a first electrically conductive shield and a plurality of electrically

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conductive paths arranged in pairs, the method comprising, for each pair, connecting a conductive element to at least one of the electrically conductive paths of the pair to balance a capacitive coupling between each of the electrically conductive paths of the pair and the first electrically conductive shield.

5 33. The method of claim 32 wherein a conductive element is added to only one of the electrically conductive paths in each pair.

 34. The method of claim 32 wherein connecting a conductive element to at least one of the electrically conductive paths of the pair comprises forming capacitive coupling traces on a rigid printed circuit board.

10 35. The method of claim 32 further comprising reducing the internal crosstalk generated in the communications outlet.

 36. The method of claim 35 further comprising reducing the modal alien crosstalk generation of the communications outlet.

15 37. The method of claim 36 further comprising providing a second electrically conductive shield structure positioned adjacent wire termination contacts of the communications outlet.

 38. The method of claim 32 wherein the method further comprises electrically isolating the electrically conductive shield so there is no direct

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electrical connection between the electrically conductive shield and the electrically conductive paths and other circuitry in the communications outlet.

39. The method of claim 32 wherein each of the electrically conductive paths includes a tine and wherein the method further comprises providing
5 from underneath the tines force to mechanically support the tines.

40. A communications outlet including an insulating body and a plurality of conductive paths, each conductive path including a corresponding outlet tine with the outlet tines being positioned adjacent one another, each outlet tine having a free end near which a plug contact is adapted to touch the outlet tine, and each outlet tine
10 having a fixed end attached to a rigid printed circuit board and coupled through a corresponding conductive trace on the rigid printed circuit board to a corresponding wire termination contact, the communications outlet comprising:

an internal crosstalk compensation stage coupled to at least some of the conductive paths and operable to reduce internal crosstalk within the communications
15 outlet;

a first modal alien crosstalk compensation stage connected to at least some of the conductive paths and operable to reduce modal alien crosstalk generated within the communications outlet; and

an alien crosstalk compensation stage, comprising:
20 an electrically conductive shield; and
a plurality of conductive elements, each conductive element being connected to a corresponding conductive path and the conductive elements being

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configured, for each signal pair, to balance a capacitive coupling between the electrically conductive shield and the conductive paths of that signal pair.

41. The communications outlet of claim 40 wherein the alien crosstalk compensation stage further comprises a snap-on connector isolation shield structure attached towards the end of the communications outlet where the wire termination contacts are located.

42. The communications outlet of claim 40 wherein the internal crosstalk compensation stage includes a first portion formed through crossover of the tines of selected pairs.

43. The communications outlet of claim 42 wherein the internal crosstalk compensation further includes a second portion formed on the rigid printed circuit board.

44. The communications outlet of claim 43 wherein the internal crosstalk compensation further includes a third portion formed on a flexible printed circuit board attached to selected ones of the tines.

45. The communications outlet of claim 40 wherein at least some of the wire termination contacts are insulation displacement connectors.

46. The communications outlet of claim 40 wherein the communications outlet further comprises an insulating body having an outer surface and

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wherein the electrically conductive shield is formed over the entire outer surface of the insulating body.

47. The communications outlet of claim 40 wherein the communications outlet comprises one of an RJ45 outlet and an ARJ45 outlet.

5 48. The communications outlet of claim 40 wherein the modal alien crosstalk compensation stage is formed on a flexible printed circuit board attached to the tines.

49. The communications outlet of claim 40 wherein the modal alien crosstalk compensation stage is formed on the rigid printed circuit board.

10 50. The communications outlet of claim 40 further comprising nonconductive and resilient spring arms connected to the rigid printed circuit board and positioned under the tines to provide mechanical support to the tines.

15 51. An electronic system, comprising:
a first electronic subsystem;
a first plurality of communications cables coupled to the first electronic subsystem, each cable including a corresponding communications plug;
a plurality of communications outlets, each communications outlet adapted to receive a corresponding one of the communications plugs, and at least some of the communications outlets comprising,

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a plurality of electrically conductive paths arranged in pairs;
an electrically conductive shield; and

a plurality of conductive elements, each conductive element being
connected to a corresponding conductive path and the conductive elements being
5 configured, for each pair, to balance a capacitive coupling between the electrically
conductive shield and the conductive paths of that pair;

a second plurality of communications cables coupled to the plurality of
communications outlets; and

a second electronic subsystem coupled to the second plurality of
10 communications cables.

52. The electronic system of claim 51 wherein the first and
second electronic subsystems each comprise computer networks.

53. The electronic system of claim 51 wherein at least some of
the communications outlets comprise one of an RJ45 outlet and an ARJ45 outlet.

15 54. The electronic system of claim 51 wherein the electrically
conductive shield is floating relative to electrically conductive paths, conductive
elements, and other electrical components in the electronic system.

55. The electronic system of claim 51 wherein each of the
electrically conductive paths includes an electrically conductive tine and wherein at
20 least some of the communications outlets further comprise:

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a first internal crosstalk compensation stage formed on a flexible printed circuit board attached to the tines;

a second internal crosstalk compensation stage formed through crossovers of the tines of selected pairs of electrically conductive paths;

5 a third internal crosstalk compensation stage formed on the rigid printed circuit board;

a modal alien crosstalk compensation stage; and

10 an alien crosstalk compensation stage including a snap-on connector isolation shield structure attached to the end of the communications outlet where the wire termination contacts are located and operable to reduce alien crosstalk levels in communications channels containing the communications outlet.

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PATENT APPLICATION
INVENTORS: FRANKLIN C. MARTI ET AL.
FILING DATE: 22 OCTOBER 2009
ATTORNEY DOCKET NO.: 2672-009-03

**HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS,
SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN
COMMUNICATIONS SYSTEMS**

ABSTRACT

5

A communications outlet includes a plurality of electrically conductive paths arranged in pairs and an electrically conductive shield. A plurality of conductive elements connected to a corresponding conductive path and the conductive elements configured, for each pair, to balance a capacitive coupling between the electrically
10 conductive shield and the conductive paths of that pair.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION
37 CFR §1.63

As a below named inventor, I hereby declare that:

My residence and country of citizenship are as stated below next to my name;

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought for the invention entitled:

**HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR
REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS**

the specification of which:

- ☒ is attached hereto.
☐ was filed _____ as United States Patent Application Serial No. _____
and was amended on _____ (if applicable) (if not present when this instrument is
executed, applicants' attorney or agent is authorized to enter the application serial number and filing
date upon receipt of the same from the United States Patent and Trademark Office).

I hereby state that I have reviewed and understand the contents of the above identified application, including the specification, claims, and drawings, and as amended by any amendment referred to herein.

Duty of Disclosure
37 CFR §1.56

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56, including for continuation-in-part (hereinafter "CIP") applications material information which became available between the filing date of the prior application and the national or Patent Cooperation Treaty international filing date of the CIP application.

Statement
18 USC §1001

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, under 18 USC §1001 and that such willful false statements may jeopardize the validity of the above identified application and/or any patent issued thereon.

Franklin C. MARTI
Residence: Clinton, Washington
Citizenship: US

10/20/09
[DATE]

Jeffrey Alan POULSEN
Residence: Edmonds, Washington
Citizenship: US

10/20/2009
[DATE]

Jason ERICKSON
Residence: Bothell, Washington
Citizenship: US

10/20/2009
[DATE]

Jeffrey P. SEEFRIED
Residence: Lake Stevens, Washington
Citizenship: US

10/20/09
[DATE]

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:

77356

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number:

77356

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

Assignee Name and Address:

Leviton Manufacturing Co., Inc.
59-25 Little Neck Pkwy.
Little Neck, NY 11362

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/95 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	<i>Ross E. Goldman</i>	Date	3/24/2009
Name	Ross E. Goldman	Telephone	(425) 415-7889
Title	Vice President and General Manager, Network Solutions, Leviton Manufacturing Co., Inc.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or maintain a benefit by the public which is to be filed by the USPTO to process an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22313-1480.

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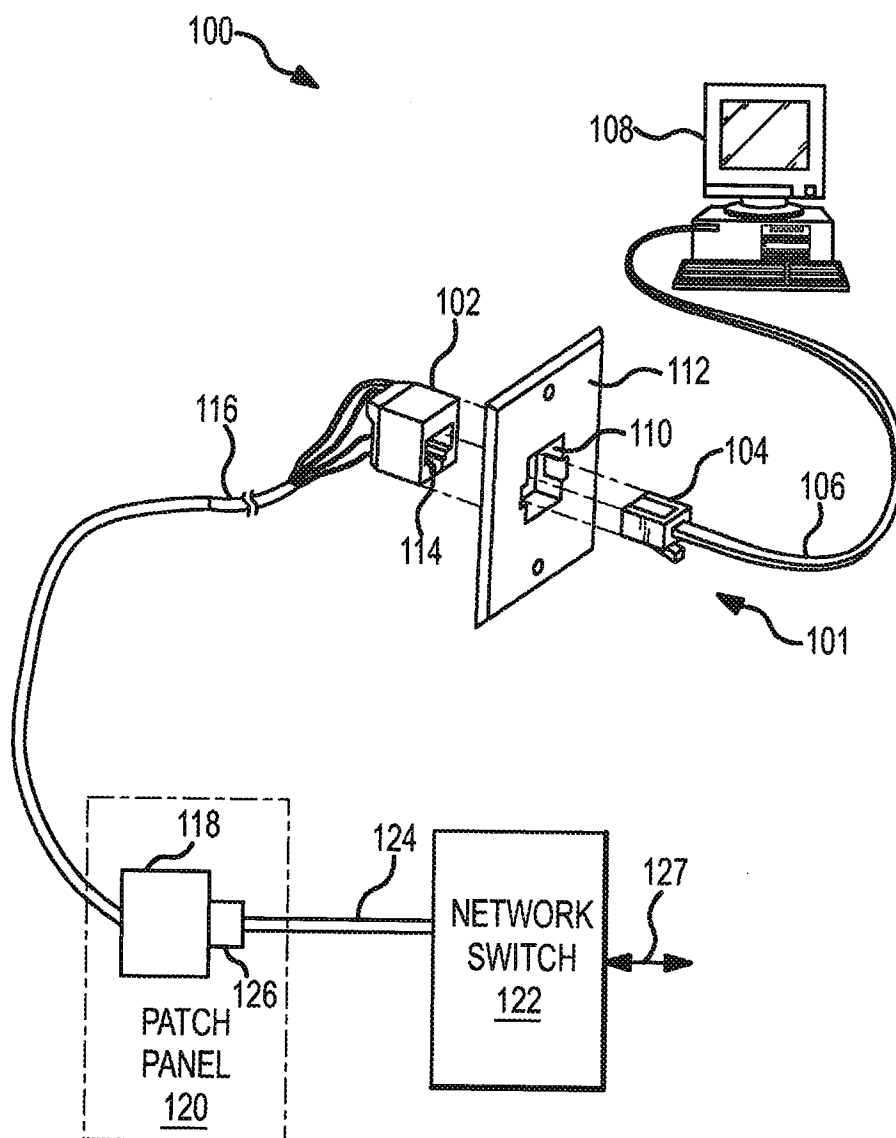


FIG. 1
(BACKGROUND ART)

81

153

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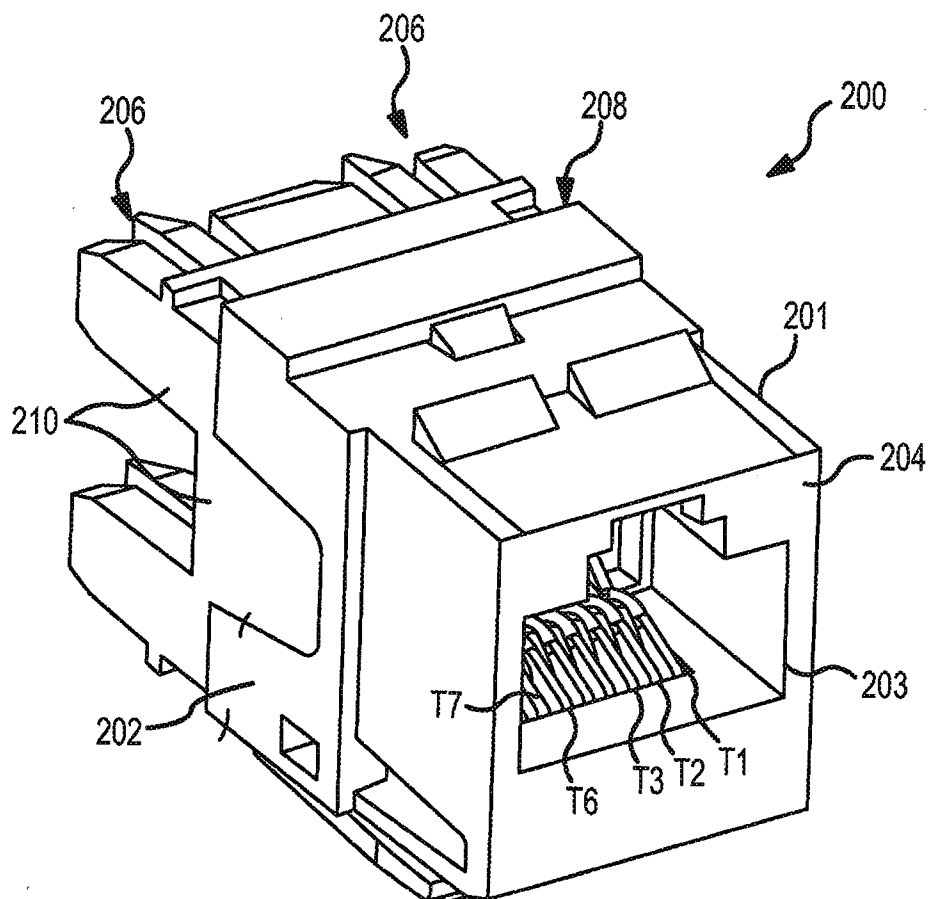


FIG.2

82

134

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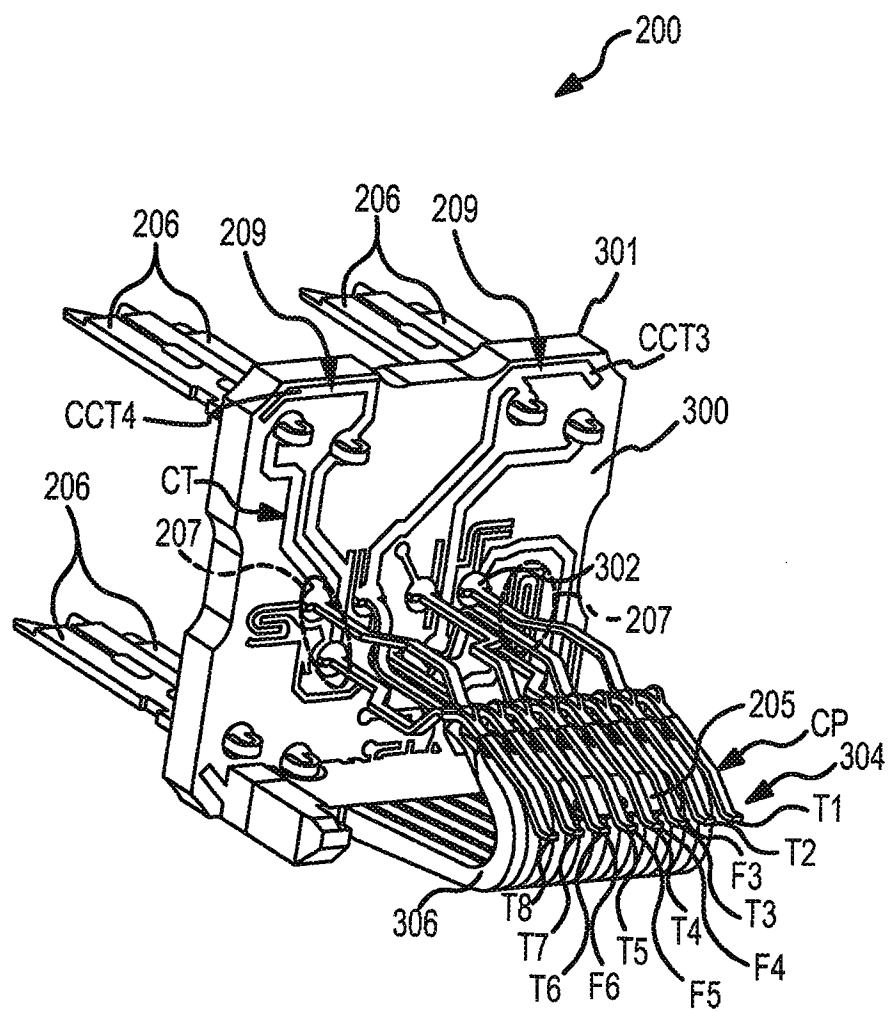


FIG.3

83

155

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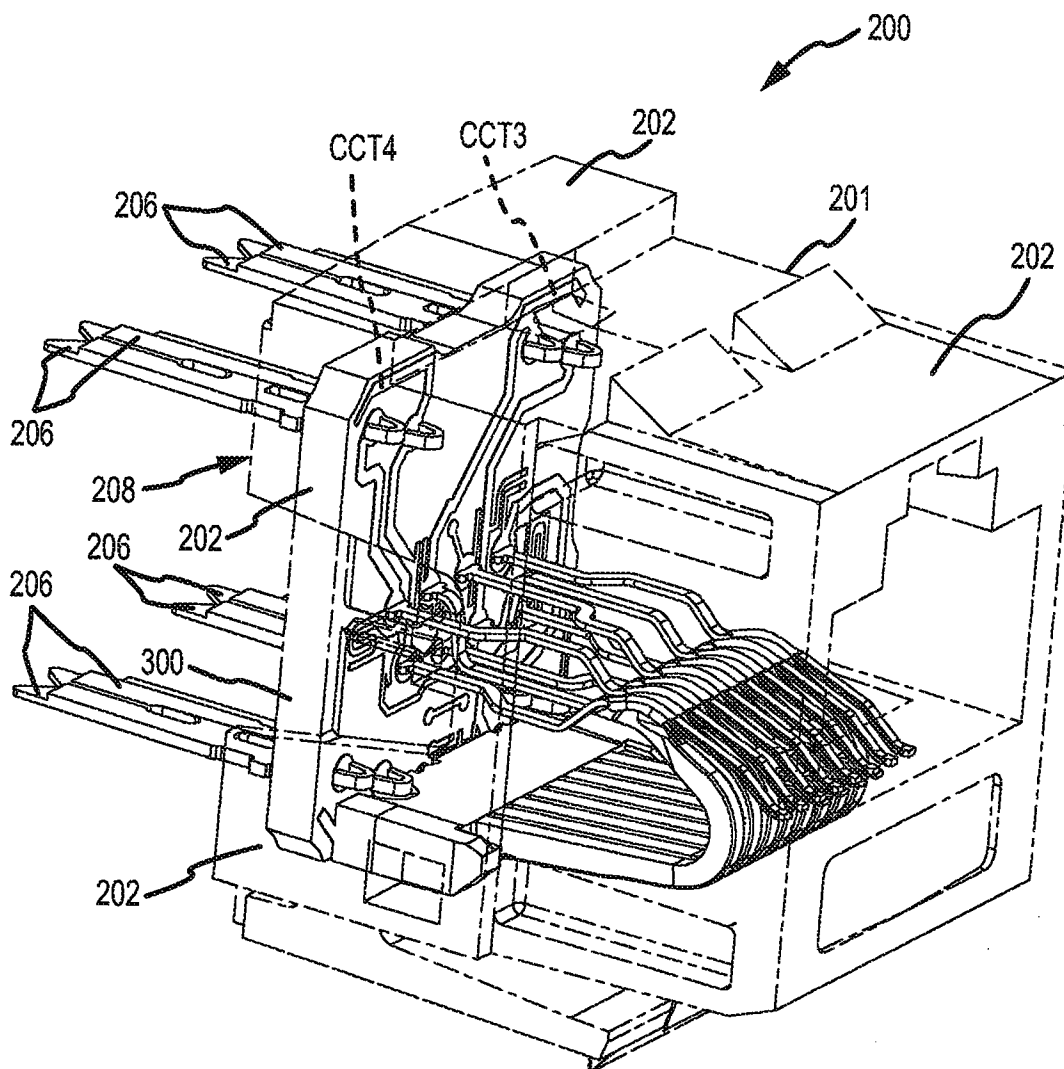


FIG.3A

84

15p

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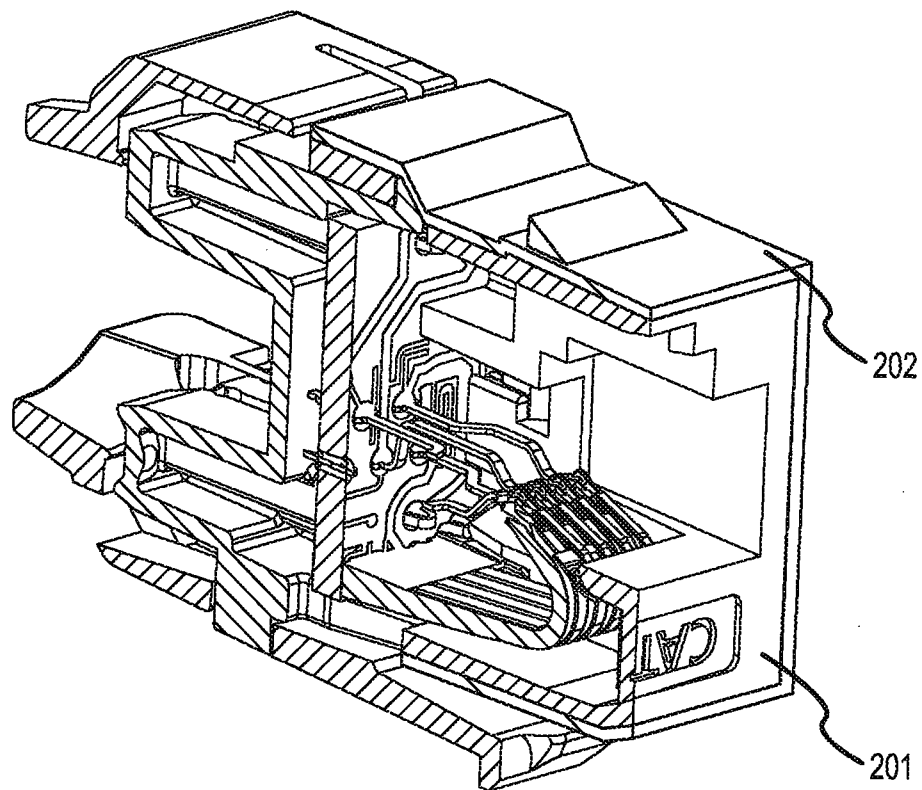
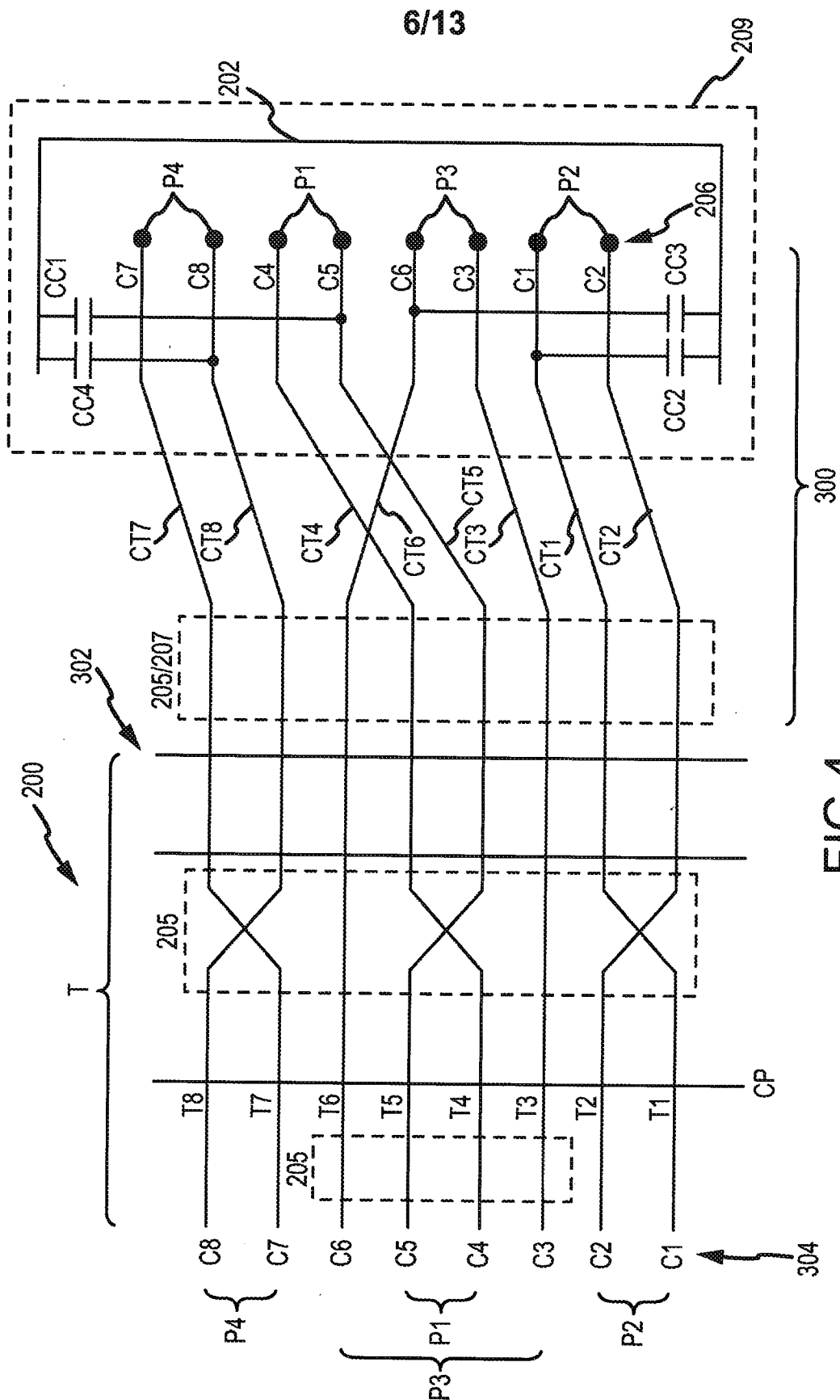


FIG.3B

85

159



86

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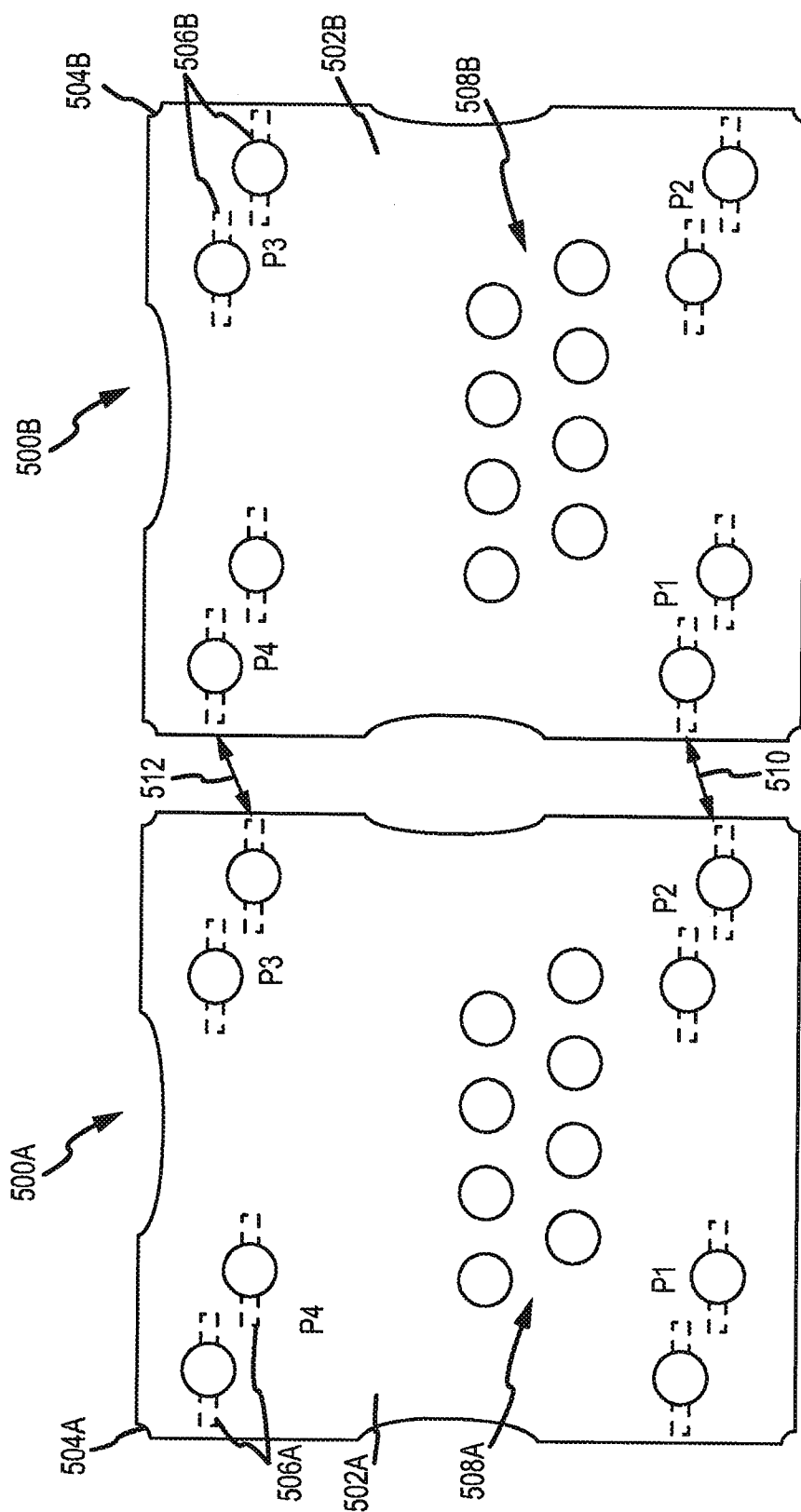


FIG. 5

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OUTLET	OUTLET B			
A	PAIR 1	PAIR 2	PAIR 3	PAIR 4
PAIR 1	MED	LOW	LOW	MED
PAIR 2	HIGH	MED	MED	MED
PAIR 3	MED	MED	MED	HIGH
PAIR 4	MED	LOW	LOW	MED

FIG.6

OUTLET POSITIONS

P4	P3
500A	
P1	P2

P4	P3
500B	
P1	P2

OUTLET	OUTLET B			
A	PAIR 1	PAIR 2	PAIR 3	PAIR 4
PAIR 1	MED	HIGH	MED	MED
PAIR 2	LOW	MED	MED	LOW
PAIR 3	LOW	MED	MED	LOW
PAIR 4	MED	MED	HIGH	MED

FIG.7

OUTLET POSITIONS

P4	P3
500A	
P1	P2

P4	P3
500B	
P1	P2

88

160

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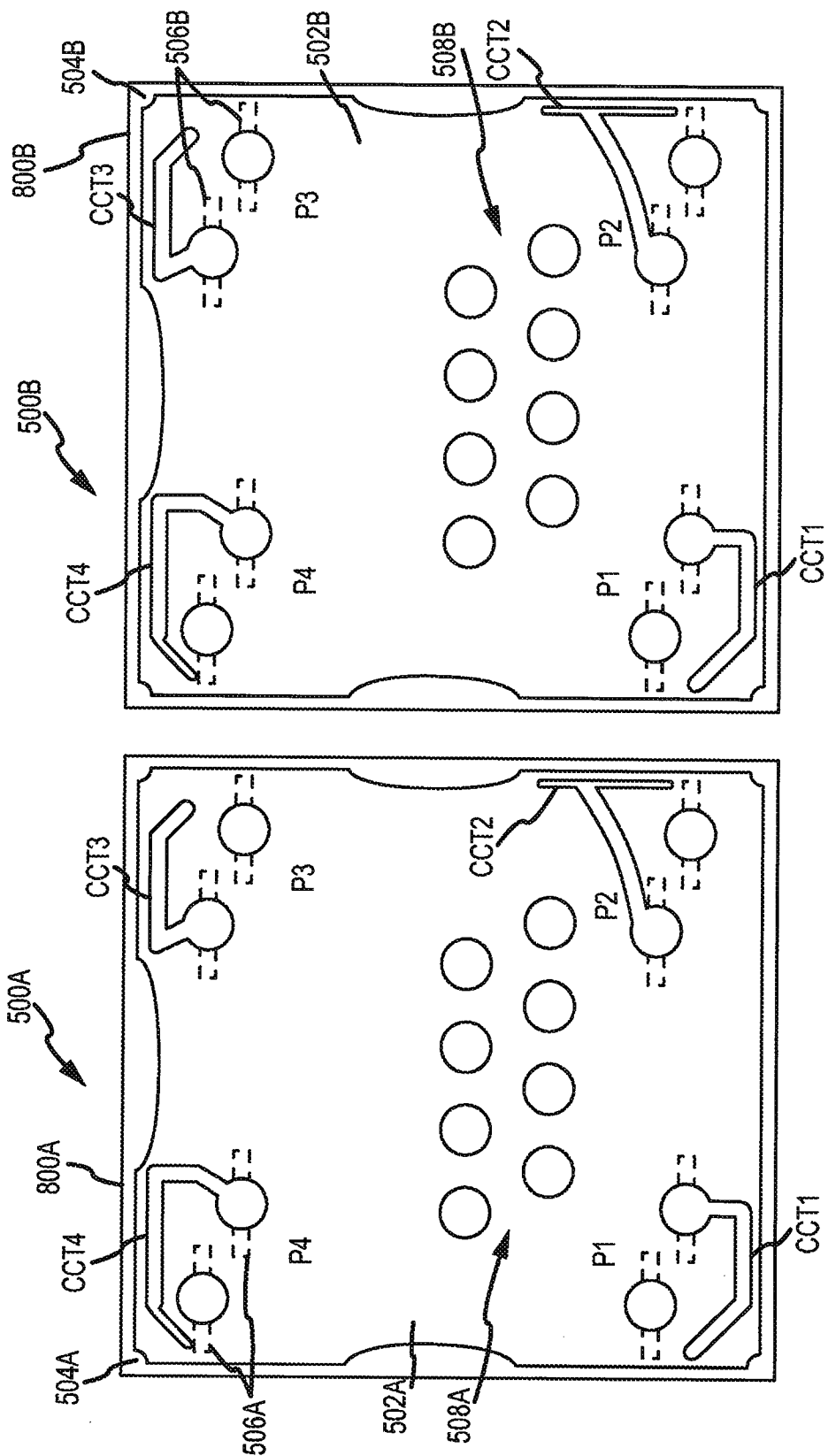


FIG. 8

89

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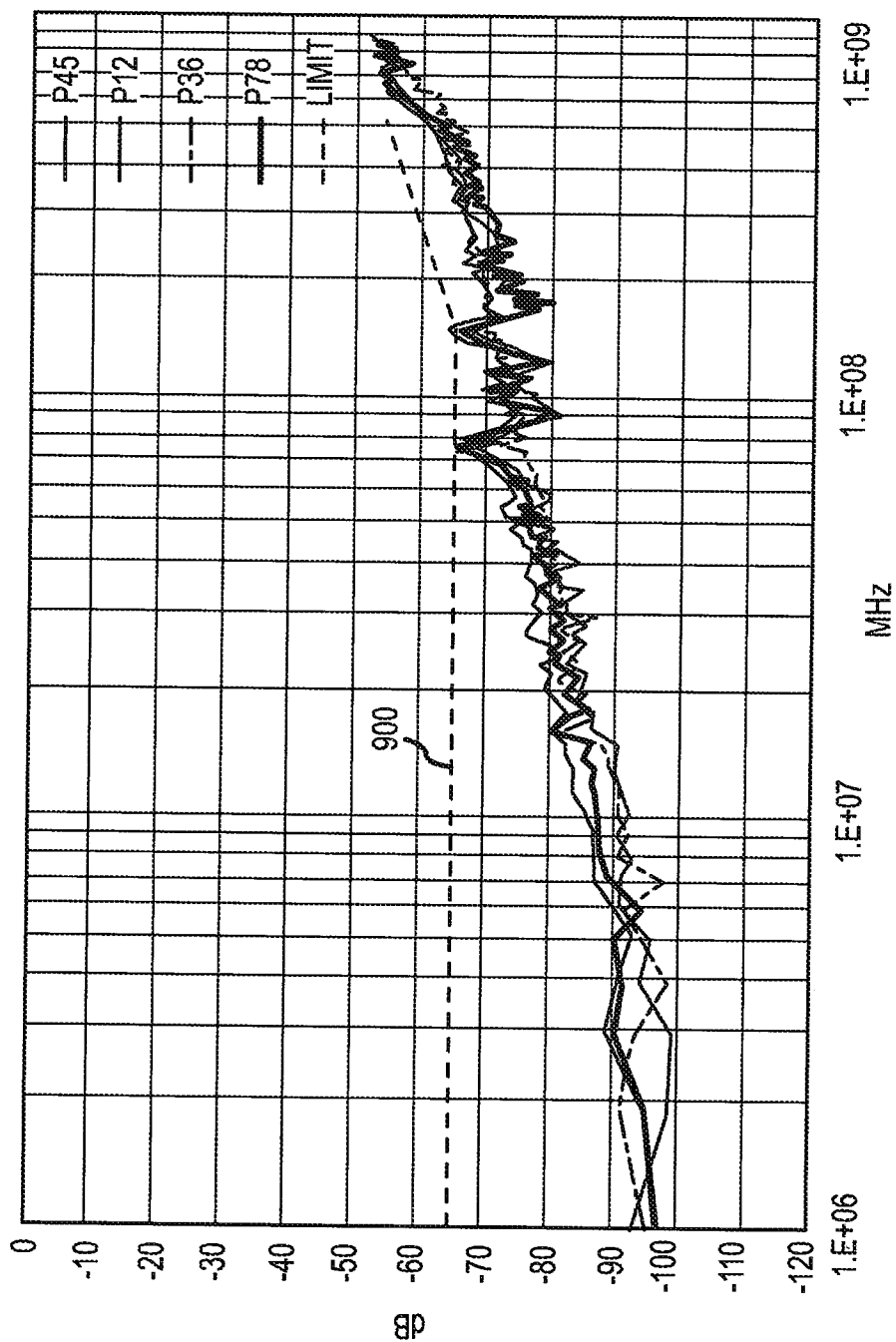


FIG.9

90

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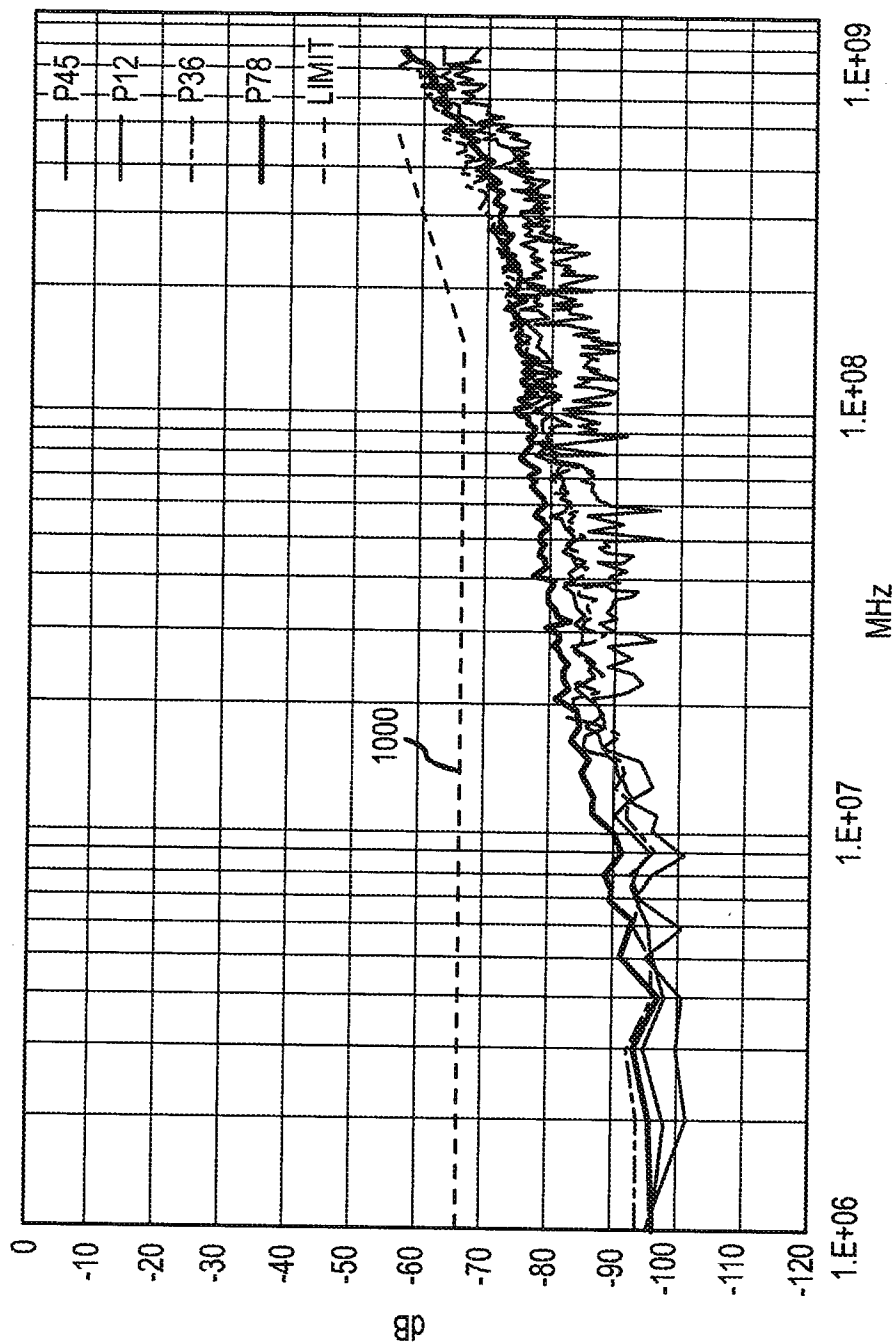


FIG.9A

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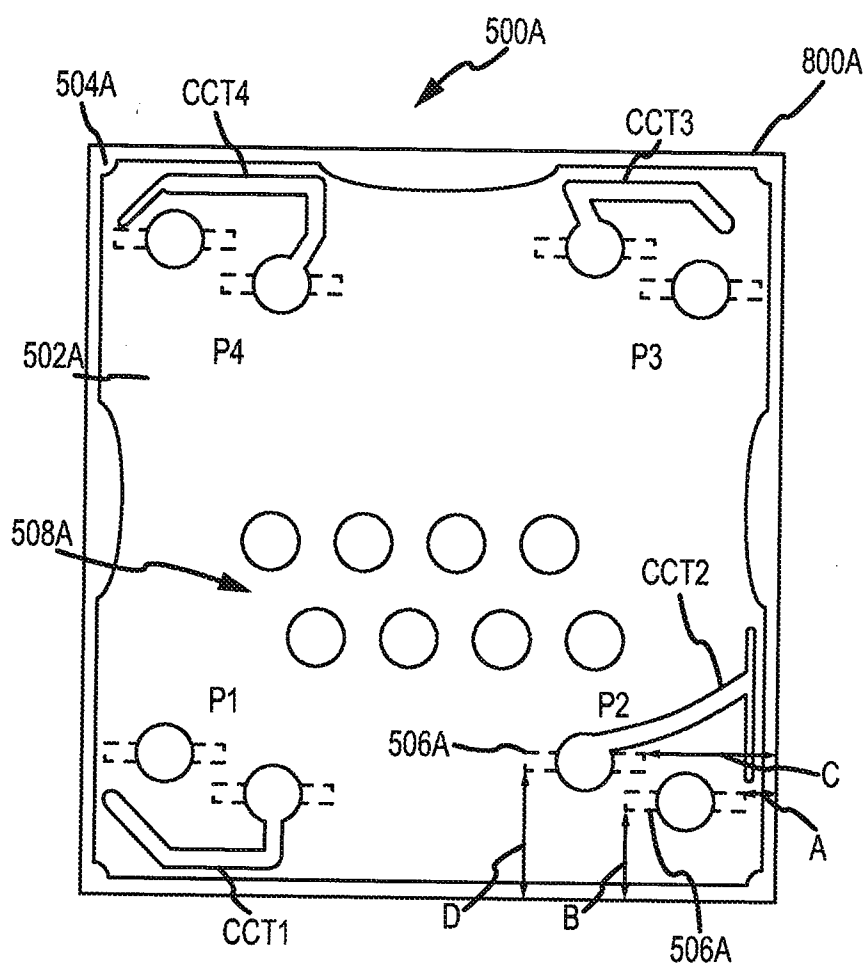


FIG.10

92

164

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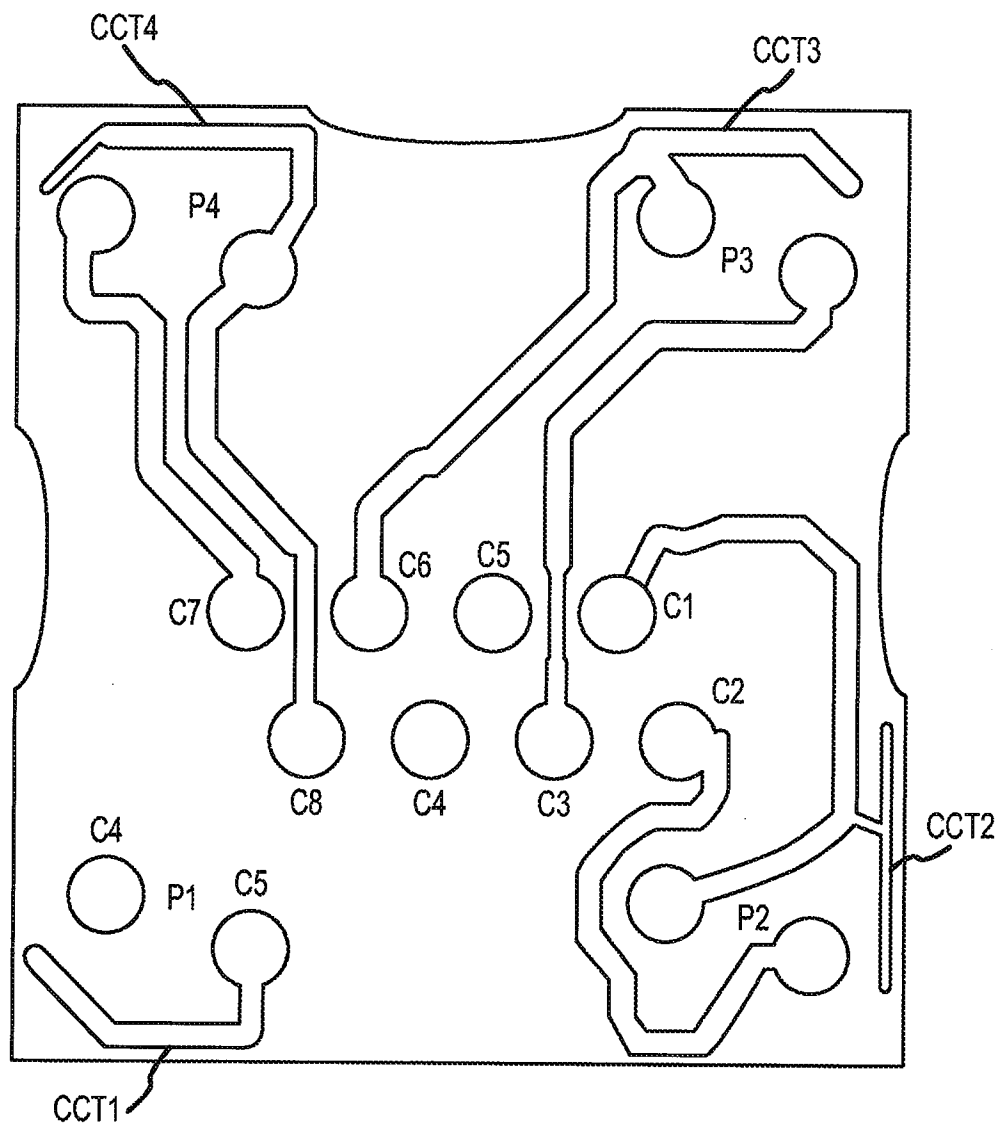


FIG.11

93

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	2672-009-03
		Application Number	
Title of Invention	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Applicant Information:

Applicant 1					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	FRANKLIN	C.	MARTI		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	CLINTON	State/Province	WA	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		4347 SHADOWOOD DRIVE			
Address 2					
City	CLINTON	State/Province	WA		
Postal Code	98236-9541	Country i	US		
Applicant 2					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	JEFFREY	ALAN	POULSEN		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	EDMONDS	State/Province	WA	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		586 ELM WAY			
Address 2					
City	EDMONDS	State/Province	WA		
Postal Code	98020	Country i	US		
Applicant 3					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	JASON		ERICKSON		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	BOTHELL	State/Province	WA	Country of Residence i	US

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	2672-009-03
		Application Number	
Title of Invention	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS		

Citizenship under 37 CFR 1.41(b) i	US		
Mailing Address of Applicant:			
Address 1	2222 - 222ND STREET SE		
Address 2			
City	BOTHELL	State/Province	WA
Postal Code	98021-4422	Countryⁱ	US
Applicant 4			Remove
Applicant Authority	☒ Inventor ☐ Legal Representative under 35 U.S.C. 117 ☐ Party of Interest under 35 U.S.C. 118		
Prefix	Given Name	Middle Name	Family Name
	JEFFREY	P.	SEEFRIED
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service			
City	LAKE STEVENS	State/Province	WA
Country of Residenceⁱ	US		
Citizenship under 37 CFR 1.41(b) i	US		
Mailing Address of Applicant:			
Address 1	11512 - 18TH PLACE SE		
Address 2			
City	LAKE STEVENS	State/Province	WA
Postal Code	98258-2032	Countryⁱ	US
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.			Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence Information of this application.	
Customer Number	77356
Email Address	patents@graybeal.com
Add Email Remove Email	

Application Information:

Title of the Invention	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS		
Attorney Docket Number	2672-009-03	Small Entity Status Claimed ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	13	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	2672-009-03
		Application Number	
Title of Invention	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS		

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.			
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	77356		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12234597	2008-09-19
Prior Application Status	Abandoned	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
2234597	non provisional of	60973675	2007-09-19
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12401587	2009-03-10
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
Remove			
Application Number	Country i	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☒ Yes ☐ No

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	2672-009-03
		Application Number	
Title of Invention	HIGH SPEED DATA COMMUNICATIONS CONNECTOR CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING CROSSTALK IN COMMUNICATIONS SYSTEMS		

Additional Foreign Priority Data may be generated within this form by selecting the Add button.

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Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1

Remove

If the Assignee is an Organization check here. ☒

Organization Name LEVITON MANUFACTURING CO., INC.

Mailing Address Information:

Address 1 201 NORTH SERVICE ROAD

Address 2

City MELVILLE

State/Province

NY

Country i US

Postal Code

11747

Phone Number

Fax Number

Email Address

Additional Assignee Data may be generated within this form by selecting the Add button.

Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Paul F. Rusyn/		Date (YYYY-MM-DD)	2009-10-22
First Name	PAUL F.	Last Name	RUSYN	Registration Number
			42118	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

2020
Bogotá D.C.,

Doctor(a)
RODRIGUEZ D' ALEMAN DILIA MARIA
Apoderado(a) y/o Representante de
LEVITON MANUFACTURING CO., INC.

REFERENCIA	Radicación No. 10 124686
	Trámite 2
	Evento 1
	Actuación 416
	Oficio No. 13086
	Folios 1

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en los artículos 26 y 27 de la Decisión 486 de la Comisión de la Comunidad Andina, y en las demás disposiciones vigentes sobre la materia, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial, conforme lo establece el artículo 40 de la misma Decisión.

Siendo manifestación expresa del interesado de efectuar la publicación "inmediato", está se realizará en la próxima gaceta de Propiedad Industrial.

Cúmplase

28 ABR. 2011

Dado en Bogotá DC,



JOSE LUIS SALAZAR LOPEZ
Director de Nuevas Creaciones (C)

mcarri

Al contestar favor indique el número de radicación consignado en el rótulo

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