

Patent Searching, ECE 3991

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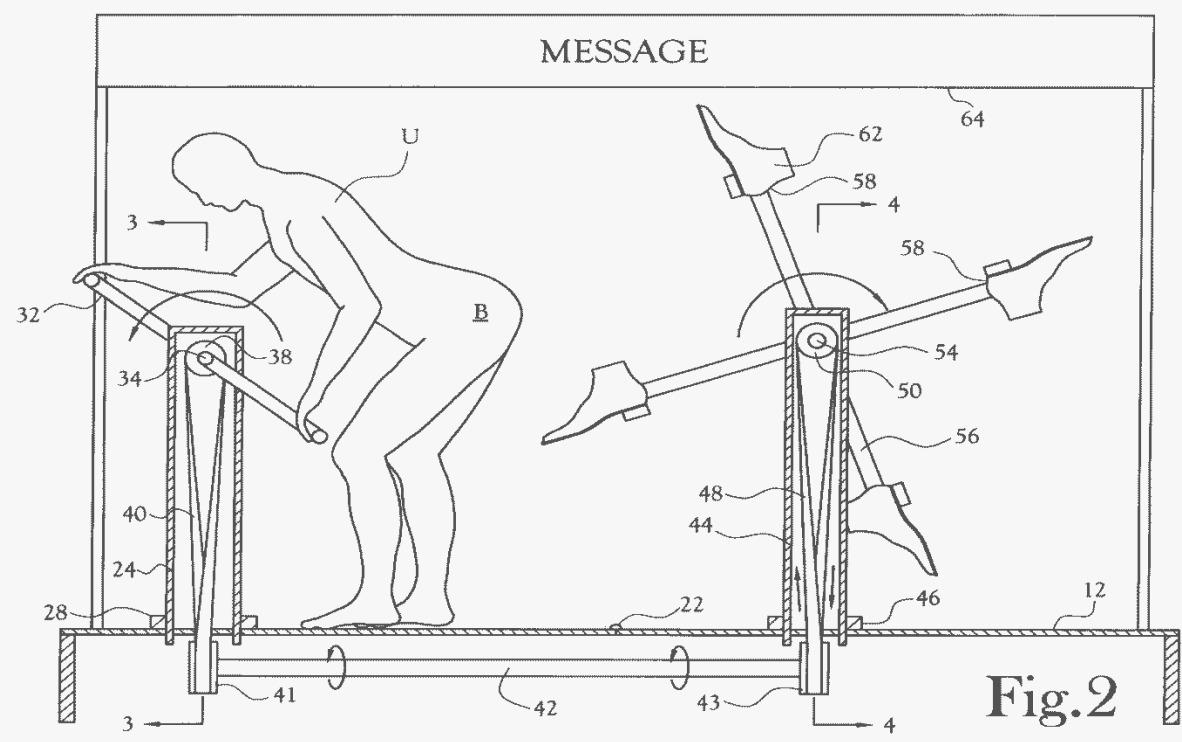
What is Intellectual Property (IP)?!

Property rights for intellectual creations that have been put into fixed, tangible format

Four types of intellectual property

- **Patents** – protects new inventions
- **Trademarks** – anything that identifies the source of a product or service offered in commerce
- **Copyrights** – protect the *specific expression of an idea* in text, music, choreography, graphic arts
- **Trade Secrets** – any secret formula, process, or business method that offers a commercial advantage to the holder

PATENTS



U.S. Patent

Sep. 25, 2001

Sheet 2 of 7

US 6,293,874 B1



What is a patent?

A Patent is a property right granted by the United States to the original inventor(s) for a limited time in exchange for public disclosure of the invention.

The Patent gives the inventor the [negative] right “to exclude others from making, using, offering for sale, or selling” the invention in the United States, or importing the invention into the United States.

Article I, Section 8, Clause 8 of the United States Constitution, known as the ‘Copyright Clause’

Three types of patents

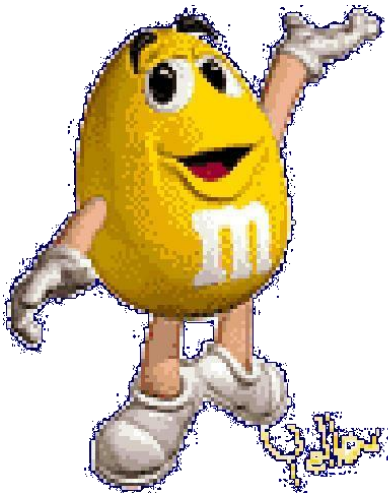
- **Utility Patents** – Granted for a process; machine or manufacture; composition of matter; or an improvement thereof. Utility patents have sequential numbers.
- **Design Patents** – Protects the new, ornamental design (i.e. “outward appearance”) for an article of manufacture. Design patent numbers are preceded by the letter “D.”
- **Plant Patents** – granted on any distinct and new variety of an asexually reproduced plant. Plant patent numbers are preceded by “PP.”

Patent Terms

- Utility patent – twenty years from the non-provisional patent filing date
- Design patent – fourteen years from issue date
- Plant patent – twenty years from filing date

Once these terms expire, the invention is now 'public domain,' and may be made, used or sold by anyone without licensing!

Trademarks



Trademarks

- Any word, phrase, symbol, logo, color, sound, or scent used to:
 - Distinguish product or service from others in the marketplace
 - Identify the source of commercial origin
 - Certify quality, standards, or geographic origin
- A service mark is the same as a trademark except that it identifies and distinguishes the source of a *service* rather than a product.

Federal trademarks once registered remain in effect for ten years, and may be renewed indefinitely once they expire.

Obtaining Trademark Rights

Three sources:

- *Common-law* use of the mark in commerce without registration; or
- Registration with the Utah (or other) State Dept. of Commerce as a *state trademark*; or
- *Federal registration* of a mark in actual use or with an ‘intent to use’ with the U.S. Patent and Trademark Office.

Trademark Symbols

- ™ and SM (*either superscript or subscript*)
 - The letters SM may be used in place of TM to indicate a service mark.
 - These two symbols indicate the owner considers this to be their **common-law** (i.e., *unregistered*) trademark.
 - May also be used with State-registered trademarks
- ®
 - This symbol indicates that the mark has been **registered with the USPTO**, and may *only* be used when such registration has been granted.

Trademarks may become generic

Trademark rights may be lost if the trademark becomes the *common term* for the product, even when produced by other companies, e.g.

- Aspirin
- Raisin Bran
- Kerosene
- Thermos
- Elevator, escalator

*So, be careful when using the words
‘Kleenex’ and ‘Xerox!’*

State & Common Law Marks

There's no legal requirement to search state or common law marks in order to apply for a federal trademark registration. However, doing so may save you time, and MONEY!



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Why Apply for a Federal Trademark?

- constructive notice to the public of claim of ownership;
- legal presumption of the registrant's ownership of the mark and exclusive right to use the mark nationwide on or in connection with the goods and/or services listed in the registration;
- use of the U.S registration as a basis to obtain registration in foreign countries;
- ✓ ability to bring an action concerning the mark in federal court;
- ✓ ability to file the U.S. registration with the U.S. Customs Service to prevent importation of infringing foreign goods.

<http://www.uspto.gov/trademarks/basics/register.jsp>

Searching Federal Trademarks

Start your search for federal trademarks at the
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<http://www.uspto.gov/trademarks/index.jsp>

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Trademarks Home

What is a trademark or service mark?

A trademark is a brand name. A trademark or service mark includes any word, name, symbol, device, or any combination, used or intended to be used to identify and distinguish the goods/services of one seller or provider from those of others, and to indicate the source of the goods/services. Although federal registration of a mark is not mandatory, it has several advantages, including notice to the public of the registrant's claim of ownership of the mark, legal presumption of ownership nationwide, and exclusive right to use the mark on or in connection with the goods/services listed in the registration.

WARNING: NON-USPTO SOLICITATIONS MAY RESEMBLE OFFICIAL USPTO COMMUNICATIONS: Be aware that private companies **not** associated with the USPTO often use trademark application and registration information from the USPTO's databases to [mail or e-mail trademark-related solicitations](#).

Highlights



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Transfer (assign) ownership of a mark to another entity or change the owner name and search the [assignments database](#).



the USPTO's databases to [mail](#) or [e-mail](#) trademark-related solicitations.

Highlights



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Visit the [Trademark Trial and Appeal Board \(TTAB\)](#) online.



Visit the [Trademark Dashboard](#) for Trademark Operation performance measurements.

Searching Utah State Trademarks

Utah State Trademarks may be searched at:

<https://secure.utah.gov/trademark/search/index.html>

and Business Names at:

<https://secure.utah.gov/bes/>

Business services are also available in person at:

Department of Commerce

Division of Corporations and Commercial Code

160 East 300 South, P.O. Box 45802

Salt Lake City, Utah 84145-0802

(801) 530-4849

Copyright



What is copyright?

- A form of protection provided to the creators of “original works of authorship.”
- Includes literary, dramatic, musical, artistic, and certain other intellectual works, both published and unpublished.
- Registered by the U.S. Copyright Office at the Library of Congress.
- Current registration fee – \$65.00 for paper filing, \$35.00 for online filing
- Copyright term – your lifetime plus 70 years.

What kinds of work are protected under copyright?

- Literary works
- Serials/Periodicals
- Musical and Dramatic works, with accompanying words or music
- Sound and video recordings
- Pictorial, Graphic and Sculptural works
- Architectural works
- Computer software
- Mask works fixed in semiconductor chips

<http://www.copyright.gov/circs/circ01.pdf>

What kinds of work are not protected?

- Works not fixed in a tangible form of expression
- Titles, names, slogans, short phrases, familiar designs or symbols, mere variations of typographic ornamentation, lettering, or coloring, mere listings of contents or ingredients
- Ideas, procedures, methods, systems, processes, concepts, principles, discoveries, or devices, as distinguished from a description, explanation, or illustration.
- Works consisting entirely of common property information and containing no original authorship.

Rights Under Copyright Law

Section 106 of the 1976 Copyright Act gives the owner of copyright, and others authorized by the owner, certain exclusive rights, including the right:

- To *reproduce* the work
- To *prepare derivative works*
- To *distribute* copies or phonorecords of the work through transfer of ownership such as through sale, or lease
- To *display* the work publicly
- To *publicly perform* the work by means of a digital audio transmission (for sound recordings)
- To *authorize* others to do all of the above

<http://www.copyright.gov/title17/index.html>, Title 17, “Copyright.”

Some limitations under Copyright Law

- Copyright covers the *particular* expression of an idea, not the idea itself!
- Rights are not unlimited – sections 107-122 of the *Copyright Law of the United States of America*, Chapter 1, establish limitations:
 - <http://www.copyright.gov/title17/92chap1.html>.

“Fair Use” Limitations

- Not mentioned in older copyright law; developed through court decisions over the years
- Currently covered in section 107 of the present copyright law (17 USC 107)
<http://www.copyright.gov/title17/92chap1.html#107>
- Covers purposes for which reproduction of a copyrighted work may be considered “fair”, and four factors used to determine the fairness of a particular use.

Four Factors That Help Determine “Fair Use”

- What is the nature of the copyrighted work?
- How much of the work is used and how substantial a portion of the whole work?
- What is the purpose and character of the use? Commercial? Nonprofit educational use?
- What effect does the use have on the potential market for or value of the copyrighted work?

Purposes For Which Reproduction of a Copyrighted Work Might Be Considered “Fair Use”

- Criticism
- Comment
- Parody
- News reporting
- Teaching
- Scholarship
- Research

How Is Copyright Secured Under Current U.S. Copyright Law?

- Automatic granted under the Berne Convention of 1989 from the time the work is created in fixed form, whether published or unpublished;
- Registration ***not required***, but confers definite advantages when dealing with enforcement issues and compensation for infringement;
- Unpublished foreign works are also eligible for copyright protection in the U.S., but there are eligibility restrictions for published foreign works.

Benefits to Copyright Registration

- Registration establishes a public record for the claim of copyright;
- For works of U.S. origin, registration is required before an infringement suit may be filed in Federal court (!);
- Registration enables the copyright owner to record the registration with the ***U.S. Customs Service*** for protection against the importation of infringing copies!

Form of Copyright Notice

- Notice of Copyright is ***no longer required*** under the Berne Convention, but may still be used, and is recommended.
- Notice has three elements:
 - The symbol © or the word “Copyright” or the abbreviation “Copr.” (Use a “P” rather than a “C” in the circle for sound recordings)
 - Year of first publication
 - Name of owner of copyright

When does a copyrighted work enter the Public Domain?

- Works copyrighted before 1923 are now in the public domain.
- Works copyrighted on or after 1/1/1923 *may still be* under copyright protection, but determining copyright is not a simple question; see <http://copyright.cornell.edu/resources/publicdomain.cfm>
- The U.S. Copyright Office will do a search to determine current copyright status on a particular work upon request, for an hourly fee.

Trade Secrets



Trade Secrets

- Information not generally known to others that is capable of yielding a business advantage over competitors who do not know it.
- May be:
 - Formulas
 - Patterns
 - Processes
 - Devices
 - Compounds
 - Data, mailing lists, etc.
 - Other compilation of information that is used in business.

Examples of Trade Secrets

- The formula for Coca-Cola is the world's most famous trade secret, but check out what the Wikipedia says [here](#) .
- Colonel Sanders' secret recipe for fried chicken, served at [KFC](#). Sanders also received U.S. patent [3,245,800](#) for a method of pressure-cooking fried chicken.
- The formula for WD-40.

Benefits of Trade Secrets

- No Fees
- No need to disclose details to the public
- Can be established without naming inventors
- No term limits
- Rights obtained immediately

Drawbacks of Trade Secrets

- Must be able to keep it a secret!
- May be independently discovered by legitimate or illegitimate means, thus, no longer a secret.
- May be more difficult to enforce rights and prosecute lawsuits involving a trade secret, as the existence of the trade secret must be proven before a lawsuit may proceed.

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Eye Spy: Scientists Develop Eye-Shaped Camera

08.06.08

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By Reuters

CHICAGO - Borrowing one of nature's best designs, U.S. scientists have built an eye-shaped camera using standard sensor materials and say it could improve the performance of digital cameras and enhance imaging of the human body.

The device might even lead to the development of prosthetic devices including a bionic eye, they said.

"This is the first time we've demonstrated a camera on a curved surface to really make it look like a human eye," said **Yonggang Huang** of Northwestern University in Evanston, Illinois, who reported his findings on Wednesday in the journal Nature.

Huang, who worked on the project with **John Rogers** of the University of Illinois at Urbana-Champaign, developed a relatively simple solution to the long-running problem of transferring microelectronic components onto a curved surface without breaking them.

"If you simply bend it, those materials are brittle like a ceramic bowl. They

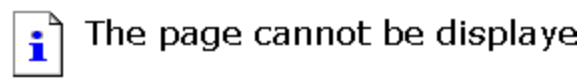
Let's begin with specific references to a new technology in an Internet new article – here we have the inventors' names, and their research affiliations.

IMPROVING THE FIELD OF VISION

"This approach allows us to put electronics in places where we couldn't before," Rogers said in a statement.

With funding from the National Science Foundation and the U.S. Department of Energy, Huang and Rogers built a digital camera that has

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White House Task Force on High Tech Patent Issues

In early June, the White House announced major steps to improve incentives for future innovation in high tech patents, a key driver of economic growth and good paying American jobs. The White House issued five executive actions and seven legislative recommendations designed to protect innovators from frivolous litigation and ensure the highest-quality patents in our system.



The Director's Forum
A blog from USPTO's leadership



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- Accessing Published Applications
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- Maintain/Pay Fees
- Appeal (PTAB)
- Change Ownership

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Statistics

Electronic Business Center

Patent Laws, Regulations, Policies & Procedures

Resources and Guidance

Search for Patents

New to Patent Searching? See this important information about searching for patents:

- [How do I know if my invention is patentable?](#)
- [How to Conduct a Preliminary U.S. Patent Search: A Step by Step Strategy](#) - Web Based Tutorial (36 minutes)
- [The Seven-Step Strategy](#) - Outlines a suggested procedure for patent searching

Patents may be searched using the following resources:

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- [Patent Application Information Retrieval \(PAIR\)](#)
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- Appeal (PTAB)
- Change Ownership
- Patent Classification
- Patent Forms
- Statistics
- Electronic Business Center
- Patent Laws, Regulations, Policies & Procedures
- Resources and Guidance
- Office of Data Management
- Announcements
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- Employee Locator
- Contact Patents

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Tools

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- Patent Application Information Retrieval (PAIR)
- USPTO Patent Full-Text and Image Database (PatFT) and Application

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Searching PGPUB Full-Text Database...

Results of Search in PGPUB Full-Text Database for:

IN/"Huang, Yonggang\$": 8 applications.

Hits 1 through 8 out of 8

No. 5 is the 2008 patent application from the news article, and no. 1 might be a *continuation* – reflecting four more years of developments – to the same invention.

Jump To

Refine Search

PUB. APP. NO.	Title
1 20120327608	Controlled Buckling Structures in Semiconductor Interconnects and Nanomembranes for Stretchable Electronics
2 20120320581	Thermally Managed LED Arrays Assembled by Printing
3 20110230747	IMPLANTABLE BIOMEDICAL DEVICES ON BIORESORBABLE SUBSTRATES
4 20100002402	Stretchable and Foldable Electronic Devices
5 20080157235	CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS
6 20070180919	Characterizing Curvatures and Stresses in Thin-Film Structures on Substrates having Spatially Non-Uniform Variations
7 20060276977	Techniques and devices for characterizing spatially non-uniform curvatures and stresses in thin-film structures on substrates with non-local effects
8 20050278126	Techniques for analyzing non-uniform curvatures and stresses in thin-film structures on substrates with non-local effects

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Full images of every page of the granted patent or published application in PDF format.

United States Patent Application
Kind Code
Rogers; John A. ; et al.

20080157235
A1
July 3, 2008

CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

Abstract

In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed, and related methods of making or tuning such stretchable components. Stretchable semiconductors and electronic circuits preferred for some applications are flexible, in addition to being stretchable, and thus are capable of significant elongation, flexing, bending or other deformation along one or more axes. Further, stretchable semiconductors and electronic circuits of the present invention are adapted to a wide range of device configurations to provide fully flexible electronic and optoelectronic devices.

Inventors: **Rogers; John A.**; (*Champaign, IL*) ; **Meitl; Matthew**; (*Raleigh, NC*) ; **Sun; Yugang**; (*Naperville, IL*) ; **Ko; Heung Cho**; (*Urbana, IL*) ; **Carlson; Andrew**; (*Urbana, IL*) ; **Choi; Won Mook**; (*Champaign, IL*) ; **Stoykovich; Mark**; (*Dover, NH*) ; **Jiang; Hanqing**; (*Urbana, IL*) ; **Huang; Yonggang**; (*Glencoe, IL*)

Correspondence
Name and Address: **GREENLEE WINNER AND SULLIVAN P C**
4875 PEARL EAST CIRCLE, SUITE 200
BOULDER
CO
80301



United States Patent and Trademark Office

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Patent #: US20080157235 Section: Front Page 1 of 109 pages Help



(19) **United States**
 (12) **Patent Application Publication** (10) **Pub. No.: US 2008/0157235 A1**
 Rogers et al. (43) **Pub. Date: Jul. 3, 2008**

(54) **CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS**
 filed on Sep. 6, 2006, provisional application No. 60/577,077, filed on Jun. 4, 2004, provisional application No. 60/601,061, filed on Aug. 11, 2004, provisional application No. 60/650,305, filed on Feb. 4, 2005, provisional application No. 60/663,391, filed on

(76) **Inventors:** John A. Rogers, Champaign, IL (US); Matthew Meitl, Raleigh, NC (US); Yugang Sun, Naperville, IL (US); Heung Cho Ko, Urbana, IL (US); Andrew Carlson, Champaign, IL (US); Won Mook Choi, Champaign, IL (US); Ma Stoykovich, Dover, NH (US); Hanqing Jiang, Urbana, IL (US); Yonggang Huang, Glencoe, IL (US)

INID codes

(52) U.S. Cl... 257/415, 438/53, 174/254, etc.

617, filed on May 4, 2005, provisional application No. 60/790,104, filed on Apr. 7, 2006.

Publication Classification

(51) **Int. Cl.**
H01L 29/84 (2006.01)
H01L 21/00 (2006.01)
H05K 1/00 (2006.01)

(52) **U.S. CL** 257/415; 438/53; 174/254; 257/E29.324; 257/E21.001

Correspondence Address:
GREENLEE WINNER AND SULLIVAN P C
 4875 PEARL EAST CIRCLE, SUITE 200
 BOULDER, CO 80301

(21) Appl. No.: 11/851,182
 (22) Filed: Sep. 6, 2007

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/145,574, filed on Jun. 2, 2005, Continuation-in-part of application No. 11/145,542, filed on Jun. 2, 2005, Continuation-in-part of application No. 11/423,287, filed on Jun. 9, 2006, which is a continuation-in-part of appli-

(57) ABSTRACT

In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed, and related methods of making or tuning such stretchable components. Stretchable semiconductors and electronic circuits preferred for some applications are flexible, in addition

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- Sections:
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 - Claims

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(3 of 6)

To examine the classifications, start by clicking the 'Home' button..

United States Patent Application
Kind Code
Rogers; John A. ; et al.

20080157235
A1
July 3, 2008

CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

Abstract

In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed, and related methods of making or tuning such stretchable components. Stretchable semiconductors and electronic circuits preferred for some applications are flexible, in addition to being stretchable, and thus are capable of significant elongation, flexing, bending or other deformation along one or more axes. Further, stretchable semiconductors and electronic circuits of the present invention are adapted to a wide range of device configurations to provide fully flexible electronic and optoelectronic devices.

Inventors: **Rogers; John A.**; (*Champaign, IL*) ; **Meitl; Matthew**; (*Raleigh, NC*) ; **Sun; Yugang**; (*Naperville, IL*) ; **Ko; Heung Cho**; (*Urbana, IL*) ; **Carlson; Andrew**; (*Urbana, IL*) ; **Choi; Won Mook**; (*Champaign, IL*) ; **Stoykovich; Mark**; (*Dover, NH*) ; **Jiang; Hanqing**; (*Urbana, IL*) ; **Huang; Yonggang**; (*Glencoe, IL*)

Correspondence Address: **GREENLEE WINNER AND SULLIVAN P C**
4875 PEARL EAST CIRCLE, SUITE 200
BOULDER



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An Agency of the Department of Commerce

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Select Classification System:

CPC USPC

Enter Classification symbol:

174 / 254
e.g., 482/1 or D14/314

Select output format:

HTML PDF

Select Content:

Schedule
Definitions
Statistical Mapping from USPC to CPC
USPC to IPC Concordance
USPC to LOCARNO (for Designs)

Clear

Submit

Class 174, subclass 254, which we got from the 'US Cl.' field on the face of the patent.

- [A](#) [P](#) 67
 - With closure for face plate opening
- [A](#) [P](#) 68.1 **CONDUITS, CABLES OR CONDUCTORS**
- [A](#) [P](#) 68.2
 - Bus bars or bus ducts (Residual)
- [A](#) [P](#) 68.3
 - Single duct conduits
- [A](#) [P](#) 250
 - Preformed panel circuit arrangement (e.g., printed circuit)
- [A](#) [P](#) 251
 - With encapsulated wire
- [A](#) [P](#) 252
 - With cooling means
- [A](#) [P](#) 253
 - Micropanel
- [A](#) [P](#) 254
 - Convertible shape (e.g., flexible) or circuit (e.g., breadboard)
- [A](#) [P](#) 255
 - With particular substrate or support structure
- [A](#) [P](#) 256
 - With particular material
- [A](#) [P](#) 257
 - Conducting (e.g., ink)
- [A](#) [P](#) 258
 - Insulating
- [A](#) [P](#) 259
 - Adhesive/bonding
- [A](#) [P](#) 260
 - With electrical device
- [A](#) [P](#) 261
 - With particular conductive connection (e.g., crossover)
- [A](#) [P](#) 262
 - Feedthrough
- [A](#) [P](#) 263
 - With solder
- [A](#) [P](#) 264
 - Voidless (e.g., solid)
- [A](#) [P](#) 265
 - Preform in hole
- [A](#) [P](#) 266
 - Hollow (e.g., plated cylindrical hole)
- [A](#) [P](#) 267
 - Termination post
- [A](#) [P](#) 268
 - With single conductive plane (e.g., tape, cable)
- [A](#) [P](#) 69
 - Extensible
- [A](#) [P](#) 70R
 - Combined
- [A](#) [P](#) 71R
 - Branched
- [A](#) [P](#) 72R
 - Multi-duct conduit and/or plural branch
- [A](#) [P](#) 72A
 - Wire harness
- [A](#) [P](#) 72B
 - Bus bars
- [A](#) [P](#) 72C
 - Casing, moldings
- [A](#) [P](#) 72TR
 - Ribbon type
- [A](#) [P](#) 71B
 - Bus bars

Class 174 ELECTRICITY: CONDUCTORS AND INSULATORS

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Select Largest Indent Level to be Displayed

- [A](#) [P](#) 1 MISCELLANEOUS
- + [A](#) [P](#) 2 LIGHTNING PROTECTION
- + [A](#) [P](#) 4R AIR TERMINALS
- + [A](#) [P](#) 5R ELECTRIC SHOCK HAZARD PROTECTIVE DEVICES
- + [A](#) [P](#) 6 EARTH GROUNDS
- + [A](#) [P](#) 8 WITH FLUIDS OR VACUUM
- + [A](#) [P](#) 32 ANTI-INDUCTIVE STRUCTURES
- + [A](#) [P](#) 37 UNDERGROUND
- + [A](#) [P](#) 40R OVERHEAD
- [A](#) [P](#) 46 HANDLES
- [A](#) [P](#) 47 COMBINED FLUID CONDUIT AND ELECTRICAL CONDUCTOR
- + [A](#) [P](#) 480 WALL MOUNTED
- + [A](#) [P](#) 50 BOXES AND HOUSINGS
- + [A](#) [P](#) 650 FEEDTHROUGH OR BUSHING
- + [A](#) [P](#) 66 COVERS OR FACE PLATES
- [A](#) [P](#) 68.1 CONDUITS, CABLES OR CONDUCTORS
 - [A](#) [P](#) 68.2 · Bus bars or bus ducts (Residual)
 - [A](#) [P](#) 68.3 · Single duct conduits
 - [A](#) [P](#) 250 · Preformed panel circuit arrangement (e.g., printed circuit)
 - [A](#) [P](#) 251 .. With encapsulated wire
 - [A](#) [P](#) 252 .. With cooling means
 - [A](#) [P](#) 253 .. Micropanel
 - [A](#) [P](#) 254 .. Convertible shape (e.g., flexible) or circuit (e.g., breadboard)
 - [A](#) [P](#) 255 .. With particular substrate or support structure
 - + [A](#) [P](#) 256 .. With particular material
 - [A](#) [P](#) 260 .. With electrical device
 - + [A](#) [P](#) 261 .. With particular conductive connection (e.g., crossover)
 - [A](#) [P](#) 268 .. With single conductive plane (e.g., tape, cable)
 - [A](#) [P](#) 69 · Extensible
 - + [A](#) [P](#) 70R · Combined

'Contracting' all the main lines, except for the one showing subclass 254..

Mainline

One-dot indention

Two-dot indention

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CLASS 174, ELECTRICITY: CONDUCTORS AND INSULATORS

- 68.1 CONDUITS, CABLES OR CONDUCTORS:
 - 250 . Preformed panel circuit arrangement (e.g., printed circuit):
 - 254 .. Convertible shape (e.g., flexible) or circuit (e.g., breadboard):

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- A P 8 WITH FLUIDS OR VACUUM
- A P 32 ANTI-INDUCTIVE STRUCTURES
- A P 37 UNDERGROUND
- A P 40R OVERHEAD
- A P 46 HANDLES
- A P 47 COMBINED FLUID CONDUIT AND ELECTRICAL CONDUCTOR
- A P 480 WALL MOUNTED
- A P 50 BOXES AND HOUSINGS
- A P 650 FEEDTHROUGH OR BUSHING
- A P 66 COVERS OR FACE PLATES
- A P 68.1 CONDUITS, CABLES OR CONDUCTORS
- A P 68.2 . Bus bars or bus ducts (Residual)
- A P 68.3 . Single duct conduits
- A P 250 . Preformed panel circuit arrangement (e.g., printed circuit)
- A P 251 .. With encapsulated wire
- A P 252 .. With cooling means
- A P 253 .. Micropanel
- A P 254 .. Convertible shape (e.g., flexible) or circuit (e.g., breadboard)



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P 254

Convertible shape (e.g., flexible) or circuit (e.g., breadboard):

This subclass is indented under [subclass 250](#). Subject matter wherein the structure is either easily bent without breaking or has means to easily change its conductor circuit configuration.

(1) Note. Terms that are somewhat synonymous with "breadboard" are "prototype" and "universal board".

SEE OR SEARCH CLASS:

[361](#), Electricity: Electrical Systems and Devices, [subclass 398](#) for flexible printed circuits which include plural, diverse electrical devices.

P 255

With particular substrate or support structure:

This subclass is indented under [subclass 250](#). Subject matter including a material means distinguished by significant construction or configuration which provides a supporting surface for other materials, especially materials used as printed-circuits patterns.

P 256

With particular material:

This subclass is indented under [subclass 250](#). Subject matter wherein at least a part of the circuit board structure is composed of one or more specific substances.

P 257

Conducting (e.g., ink):

This subclass is indented under [subclass 256](#). Subject matter including a material adapted to the transmission of electricity.

(1) Note. The conducting material may be for example superconducting, semiconducting or resistive.

P 258

Insulating:

This subclass is indented under [subclass 256](#). Subject matter including a material on or through which essentially no electrical current flow.

P 259

Adhesive/bonding:

This subclass is indented under [subclass 256](#). Subject matter including a material which causes parts of the structure to stick, bind or fasten together.

SEE OR SEARCH THIS CLASS, SUBCLASS:

[263](#), for soldered feed through connections where the composition of the solder is nominal.

SEE OR SEARCH CLASS:

Class 174 ELECTRICITY: CONDUCTORS AND INSULATORS

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Turn Outline

Select Largest Indent Level to be Displayed

- 1 MISCELLANEOUS
- + 2 LIGHTNING PROTECTION
- + 4R AIR TERMINALS
- + 5R ELECTRIC SHOCK HAZARD PROTECTIVE DEVICES
- + 6 EARTH GROUNDS
- + 8 WITH FLUIDS OR VACUUM
- + 32 ANTI-INDUCTIVE STRUCTURES
- + 37 UNDERGROUND
- + 40R OVERHEAD
- 46 HANDLES
- 47 COMBINED FLUID CONDUIT AND ELECTRICAL CONDUCTOR
- + 480 WALL MOUNTED
- + 50 BOXES AND HOUSINGS
- + 650 FEEDTHROUGH OR BUSHING
- + 66 COVERS OR FACE PLATES
- 68.1 CONDUITS, CABLES OR CONDUCTORS
- 68.2
 - Bus bars or bus ducts (Residual)
- 68.3
 - Single duct conduits
- 250
 - Preformed panel circuit arrangement (e.g., printed circuit)
- 251
 - With encapsulated wire
- 252
 - With cooling means
- 253
 - Micropanel
- 254
 - Convertible shape (e.g., flexible) or circuit (e.g., breadboard)

Results of Search in US Patent Collection db for:

CCL/174/254: 1306 patents.

Hits 1 through 50 out of 1306

All Granted Patents since 1790 that have a classification in 174/254 (the oldest was granted in 1926!).

Feb 2010 – 992 patents;

Feb 2011 – 1059 patents;

Feb 2012 – 1140 patents;

Aug 2013 – 1306 patents!













Note the increasing rate of change!

Next 50 Hits

Jump To

Refine Search CCL/174/254

PAT.
NO.

- 1 [8,520,399](#)  [Stretchable electronics modules and circuits](#)
- 2 [8,520,392](#)  [Electronic control unit and method for producing component of same](#)
- 3 [8,519,272](#)  [Suspension substrate, manufacturing method of suspension substrate, suspension, device-mounted suspension, and hard disk drive](#)
- 4 [8,519,271](#)  [Flexible printed circuit, touch panel, display panel and display](#)
- 5 [8,514,589](#)  [Electronic apparatus](#)
- 6 [8,513,534](#)  [Semiconductor device and bonding material](#)
- 7 [8,513,533](#)  [Multilayer stacked circuit arrangement with localized separation section](#)
- 8 [8,513,532](#)  [Flexible circuit structure with stretchability and method of manufacturing the same](#)
- 9 [8,513,531](#)  [Electrodynamic arrays having nanomaterial electrodes](#)
- 10 [8,507,802](#)  [Ultra-low current printed circuit board](#)
- 11 [8,507,801](#)  [Printed wiring board](#)
- 12 [8,503,134](#)  [Wiring substrate with a torsion restrictor for a terminal](#)

	A	P	1	MISCELLANEOUS
+	A	P	2	LIGHTNING PROTECTION
+	A	P	4R	AIR TERMINALS
+	A	P	5R	ELECTRIC SHOCK HAZARD PROTECTIVE DEVICES
+	A	P	6	EARTH GROUNDS
+	A	P	8	WITH FLUIDS OR VACUUM
+	A	P	32	ANTI-INDUCTIVE STRUCTURES
+	A	P	37	UNDERGROUND
+	A	P	40R	OVERHEAD
	A	P	46	HANDLES
	A	P	47	COMBINED FLUID CONDUIT AND ELECTRICAL CONDUCTOR
+	A	P	480	WALL MOUNTED
+	A	P	50	BOXES AND HOUSINGS
+	A	P	650	FEEDTHROUGH OR BUSHING
+	A	P	66	COVERS OR FACE PLATES
-	A	P	68.1	CONDUITS, CABLES OR CONDUCTORS
	A	P	68.2	· Bus bars or bus ducts (Residual)
	A	P	68.3	· Single duct conduits
-	A	P	250	· Preformed panel circuit arrangement (e.g., printed circuit)
	A	P	251	.. With encapsulated wire
	A	P	252	.. With cooling means
	A	P	253	.. Micropanel
	A	P	254	.. Convertible shape (e.g., flexible) or circuit (e.g., breadboard)
	A	P	255	.. With particular substrate or support structure
+	A	P	256	.. With particular material
	A	P	260	.. With electrical
+	A	P	261	.. With particular
	A	P	268	.. With single co
	A	P	69	· Extensible
+	A	P	70R	· Combined
+	A	P	95	· Plural duct
	A	P	98	· With embedded conduit-duct or conductor



If we go back and click on the blue 'A' in the Classification Schedule, we get a list of all applications published since 2001 that have a classification in 174/254.

Results of Search in PGPUB Full-Text Database for:

CCL/"174"/254: 663 applications.

Hits 1 through 50 out of 663

All published applications from 2001 to the present that have a classification in 174/254. Some of these published applications will also show up as Granted Patents, but the text will most likely be different from the application.

- Feb 2008 - 151
- Feb 2010 - 301 (two year interval)
- Feb 2011 - 413
- Feb 2012 - 532
- Aug 2013 - 663!

Once again, note the positive rate of change!

Next 50 Hits

Jump To

Refine Search CCL/"174"/254

PUB. APP. NO.	Title
1 20130215579	PACKAGING TECH
2 20130213697	FLEXIBLE LED DE
3 20130213696	METAL-CLAD LAMINATE, METHOD FOR PRODUCING SAME, AND FLEXIBLE PRINTED BOARD
4 20130213695	METHOD OF MANUFACTURING FLYING TAIL TYPE RIGID-FLEXIBLE PRINTED CIRCUIT BOARD AND FLYING TAIL TYPE RIGID-FLEXIBLE PRINTED CIRCUIT BOARD MANUFACTURED BY THE SAME
5 20130187988	CORROSION PROTECTED FLEXIBLE PRINTED WIRING MEMBER
6 20130180764	Flexible Circuitry with Heat and Pressure Spreading Layers
7 20130176693	CIRCUIT BOARD FOR DISPLAY AND DISPLAY MODULE WITH DISPLAY AND CIRCUIT BOARD
8 20130176692	METHOD FOR PRODUCING A CIRCUIT BOARD CONSISTING OF A PLURALITY OF CIRCUIT BOARD AREAS AND CIRCUIT BOARD
9 20130171520	AQUEOUS POLYIMIDE PRECURSOR SOLUTION COMPOSITION AND METHOD FOR PRODUCING AQUEOUS POLYIMIDE PRECURSOR SOLUTION COMPOSITION
10 20130170158	Knitted textile substrate with different stitch patterns and electronic textile
11 20130163253	WHITE REFLECTIVE FLEXIBLE PRINTED CIRCUIT BOARD
12 20130162922	CONNECTING STRUCTURE OF ELECTRONIC APPARATUS AND DISPLAY DEVICE USING THE SAME
13 20130161078	RIGID-FLEX CIRCUIT BOARD AND MANUFACTURING METHOD

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AND

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Here's an example of searching for an exact keyword phrase in the Applications database. Note the dollar sign (\$) used as a 'wild card,' and the quotation marks to search for that exact phrase as a whole, not the words individually.

Searching PGPUB Full-Text Database...

Results of Search in PGPUB Full-Text Database for:

"flexible circuit board\$": 4008 applications.

Hits 1 through 50 out of 4008

Too many applications to look through! How can we reduce the number of applications we must examine? Remember, we only need a few examples of similar inventions, which will then lead us to the appropriate classifications!

Next 50 Hits

Jump To

Refine Search "flexible circuit board\$"

PUB. APP. NO.	Title
1	20130211372 Body Cavity Physiological Measurement Device
2	20130211322 SYSTEMS AND METHODS FOR TREATING CHRONIC LIVER FAILURE BASED ON PERITONEAL DIALYSIS
3	20130211291 PERSONAL EMERGENCY RESPONSE (PER) SYSTEM
4	20130210277 HIGH SPEED COMMUNICATION JACK
5	20130208509 Backlight Module and Thermal Design Thereof
6	20130208408 DEVICE MODULE
7	20130208233 THREE DIMENSIONAL GLASSES
8	20130207946 FLEXIBLE DISPLAY
9	20130207856 HYBRID ANTENNA FOR PORTABLE COMMUNICATION DEVICES
10	20130207596 ELECTROCHEMICAL ENERGY CONVERTER DEVICE WITH A CELL HOUSING, A BATTERY WITH AT LEAST TWO OF SAID ELECTROCHEMICAL ENERGY CONVERTER DEVICES, AND A METHOD FOR THE MANUFACTURE OF AN ELECTROCHEMICAL ENERGY CONVERTER DEVICE
11	20130206844 PROTECTIVE COVER OF MOBILE ELECTRONIC PRODUCT
12	20130206721 METHOD FOR MANUFACTURING A TOUCH PANEL
13	20130202985 FLEXIBLE CIRCUIT BOARD AND METHOD FOR MANUFACTURING THE SAME AND FUEL CELL USING

US PATENT & TRADEMARK OFFICE
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Query [\[Help\]](#)

Term 1: "flexible circuit board\$" in Field 1: Title

OR

Term 2: "flexible circuit board\$" in Field 2: Abstract

Select years [\[Help\]](#) 2001-present

Search

Reset

We may restrict the number of 'hits' for our keyword phrase by limiting the phrase to only the 'Title' OR the 'Abstract' fields on the front page of each application!

Searching PGPUB Full-Text Database...

Results of Search in PGPUB Full-Text Database for:

TTL/"flexible circuit board\$" OR ABST/"flexible circuit board\$": 380 applications.

Hits 1 through 50 out of 380

Much better results!

Next 50 Hits

Jump To

Refine Search TTL/"flexible circuit board\$" OR ABST/"flexible circuit

PUB. APP. NO.	Title
1	20130210277 HIGH SPEED COMMUNICATION JACK
2	20130208509 Backlight Module and Thermal Design Thereof
3	20130202985 FLEXIBLE CIRCUIT BOARD AND METHOD FOR MANUFACTURING THE SAME, AND FUEL CELL USING THE FLEXIBLE CIRCUIT BOARD
4	20130195438 LENS BARREL HAVING SHUTTER FLEXIBLE CIRCUIT BOARD AND IMAGE PICKUP APPARATUS HAVING THE SAME
5	20130176693 CIRCUIT BOARD FOR DISPLAY AND DISPLAY MODULE WITH DISPLAY AND CIRCUIT BOARD
6	20130175984 MOBILE TERMINAL POWER RECEIVING MODULE UTILIZING WIRELESS POWER TRANSMISSION AND MOBILE TERMINAL RECHARGABLE BATTERY INCLUDING MOBILE TERMINAL POWER RECEIVING MODULE
7	20130163240 LED STREET LAMP
8	20130160183 TEXTILE ARRANGEMENT AND METHOD FOR MANUFACTURING
9	20130141912 CIRCUIT BOARD FOR DISPLAY DEVICE AND DISPLAY DEVICE HAVING THE SAME
10	20130135854 ILLUMINATION DEVICE
11	20130128524 Back Frame and Backlight System Thereof

How can we find out about the research strengths of a particular business or research institution? Such as, in the case of our current example, Northwestern University?!

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US PATENT & TRADEMARK OFFICE

PATENT APPLICATION FULL TEXT AND IMAGE DATABASE

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AND

Term 2: in Field 2:

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Here, we change the 'Field' name to 'Assignee Name,' that is, the entity that owns the rights to the patent.

Searching PGPUB Full-Text Database...

Results of Search in PGPUB Full-Text Database for:

AN/"Northwestern University": 499 applications.

Hits 1 through 50 out of 499

New patent applications reflect many of Northwestern University's strongest research areas. When we search with the name of a particular company, the results may provide 'competitive intelligence' about that company's research interests.

Next 50 Hits

Jump To

Refine Search AN/"Northwestern Unive

PUB. APP. NO.	Title
1 20130211500	Liquid Cast Biodegradable Arterial Stent
2 20130210050	PROTEASE FOR PROTEOMICS
3 20130209999	SQSTM1 MUTATIONS IN AMYOTROPHIC LATERAL SCLEROSIS
4 20130199605	COMPOSITE OF GRAPHENE OXIDE AND NANOSTRUCTURES, METHODS OF MAKING AND APPLICATIONS OF SAME
5 20130196469	Low-Temperature Fabrication of Metal Oxide Thin Films and Nanomaterial-Derived Metal Composite Thin Films
6 20130195828	Pharmaceutical Compositions and Methods for Digesting Atherosclerotic Plaques
7 20130195759	NANOSTRUCTURES SUITABLE FOR SEQUESTERING CHOLESTEROL AND OTHER MOLECULES
8 20130184144	METHODS OF MAKING NON-COVALENTLY BONDED CARBON-TITANIA NANOCOMPOSITE THIN FILMS AND APPLICATIONS OF THE SAME
9 20130183671	ALLELIC DISORDERS CAUSED BY MUTATIONS IN TRPV4
10 20130174884	ANISOTROPIC AMBIPOLAR TRANSVERSE THERMOELECTRICS AND METHODS FOR MANUFACTURING THE SAME
11 20130172404	Delivery of Oligonucleotide Functionalized Nanoparticles
12 20130150560	AMYLOID BETA-DERIVED DIFFUSIBLE LIGANDS (ADDLs), ADDL-SURROGATES, ADDL-BINDING

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cc1/174/254

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- EP documents
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- WIPO (PCT)
- German Patents (Beta)
- Non-patent Literature

Date Range*

All years Last 20 years

Word Stemming

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Chronological Relevancy

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Coverage Details: Coverage details for the patent database can be found [here](#).

Note that most fields support Phrase (ABST/"cardboard box"), Proximity (ABST/"cardboard box"~5), Wildcard (ABST/card*), and Leading Wildcard (ABST/*ectomy) queries. Some fields support range queries and math operations. Only basic examples are provided below. See the [syntax guide](#) for advanced syntax details.

Field Abbr.	Field Name	Type	Syntax Example and Comments
AADR	Assignee Address (complete string)	Text	AADR/California AADR/"Route 66"
ABST	Abstract	Text	ABST/widget ABST/"titanium steel"
AC	Assignee City	Text	AC/Paris AC/"New York"
ACLM	Claims	Text	ACLM/"cardboard box"
ACN	Assignee Country	Text	ACN/JP or ACN/US
AGT	Agent	Text	AGT/"Bacon & Thomas"
AGTC	Agent Address City	Text	AGTC/Paris



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Save Search:

Search name Click here to save this search Save

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Table with 5 columns: Match, Document, Document Title, Score, PDF. Contains 4 rows of patent search results.



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E1 Abstract

	A	C	D	E
1	Number	Date	Title	Abstract
2	8513531	2013-08-20	Electrodynamic arrays having nanomaterial electrodes	An electrodynamic array of conductive nanomaterial electrodes
3	8513532	2013-08-20	Flexible circuit structure with stretchability and method of manufactur	A flexible circuit structure with stretchability comprises a flexible
4	8513534	2013-08-20	Semiconductor device and bonding material	The present invention is directed to enhancing the bonding reliab
5	8500938	2013-08-06	Method for producing a flexi-rigid printed circuit board and flexi-rigid p	The invention relates to a method for producing a flexi-rigid printe
6	8502080	2013-08-06	Flexible printed circuit board with waterproof structure	A flexible printed circuit board with waterproof structure includes
7	8503134	2013-08-06	Wiring substrate with a torsion restrictor for a terminal	A wiring substrate comprises a conductor pattern embedded in ;
8	8492657	2013-07-23	Printed wiring board, method for forming the printed wiring board, and	A board interconnection structure having a first printed wiring bo;
9	8487190	2013-07-16	Flexible printed circuit board	A flexible printed circuit board includes a substrate, signal lines,
10	8487191	2013-07-16	Flexible laminate and flexible electronic circuit board formed by using	An adhesive-free flexible laminate formed from a polyimide film in
11	8481855	2013-07-09	Flexible wiring substrate	A plurality of protruding substrate portions (12) is extended from
12	8481862	2013-07-09	Low profile compliant leads	The present invention relates to a connector system for resilientl
13	8476531	2013-07-02	Flex-rigid wiring board and method of manufacturing the same	A flex-rigid wiring board includes a flexible board including a flex
14	8476533	2013-07-02	Printed circuit board	An exemplary printed circuit board includes a substrate, a differ
15	8476535	2013-07-02	Multilayered printed wiring board and method for manufacturing the sa	A multilayered printed wiring board includes a flexible wiring boa
16	8477507	2013-07-02	Suspension board assembly sheet with circuits and method for manu	An assembly sheet includes a plurality of suspension boards an
17	8471151	2013-06-25	Layout method for bridging electrode capable of shielding bright spot	A layout method for a bridging electrode capable of shielding a b
18	8466369	2013-06-18	Circuit structure of circuit board	A circuit structure of a circuit board includes a dielectric layer, a
19	8466371	2013-06-18	Printed circuit board interconnecting structure with compliant cantilev	An interconnecting structure for interconnecting two electronic n
20	8461459	2013-06-11	Flex-rigid wiring board and method for manufacturing the same	A flex-rigid wiring board includes an insulative substrate, a flexib
21	8453321	2013-06-04	Method for manufacturing multilayer flexible printed circuit board	A method for manufacturing a multilayer FPCB which includes p
22	8456851	2013-06-04	Flex circuit with single sided routing and double sided attach	A flex circuit having conductive traces formed on only one side c
23	8450614	2013-05-28	Signal transmission line and circuit board	A signal line and a circuit board that can be easily bent in a U s
24	8441803	2013-05-14	Retaining facility for printed circuit boards on curved surfaces	A retaining facility for clearance-free fixing of a printed circuit bo;
25	8431828	2013-04-30	Composite substrate	A composite substrate is disclosed. In one aspect, the substrat
26	8426739	2013-04-23	Printed circuit board and method for manufacturing the same, and pa	Disclosed is a printed circuit board including an insulation meml
27	8420216	2013-04-16	Thermosetting resin composition	The thermosetting resin composition according to the present in
28	8420944	2013-04-16	Connection structure of flexible printed circuits and optical pickup dev	A connection structure of Flexible printed circuits comprising: fir
29	8420946	2013-04-16	Printed circuit board	An exemplary printed circuit board includes a substrate, a differ
30	8422239	2013-04-16	Display device	A display device includes a display panel, a case that has a mic
31	8410372	2013-04-02	Wiring board, stacked battery device, and vehicle having stacked batt	A wiring board to be inserted between collector foils of each unit
32	8410709	2013-04-02	Parallel light-emitting circuit of parallel LED light-emitting device and	A circuit board of a parallel light-emitting circuit of parallel LED li

	A	C	D	E	F	G	H	I
1	Document Number	Publication Date	Title	Abstract	Inventor Name	Assignee	Application Number	Filing
2	US20090071696	2009-03-19	PARTIALLY RIGID FLEXIBLE	(The present invention relates to	Yang, Rui (Austin, TX, US); Kr	3M Innovative Properties Comp	11/855038	2007-
3	6211468	2001-04-03	Flexible circuit with conductive	A flexible circuit includes a flex	Windschitl, David J. (Leander,	3M Innovative Properties Comp	09/132828	1998-
4	7348045	2008-03-25	Controlled depth etched dielect	A dielectric film for use as a	su Yang, Rui (Austin, TX, US); Du	3M Innovative Properties Comp	10/235465	2002-
5	7745733	2010-06-29	Generic patterned conductor fo	A method of making a multilay	Jambor, George F. (Slinger, WI)	3M Innovative Properties Comp	11/120025	2005-
6	7888604	2011-02-15	Connection method of a flexible	Provided is a method of connec	Kawate, Kohichiro (Tokyo, JP)	3M Innovative Properties Comp	11/910685	2006-
7	US20030094305	2003-05-22	Pressure-welded structure of fl	A pressure-welded structure of	Ueda, Hiroshi (Kikuchi-gun, JP)	ADVANCED DISPLAY INC.	10/280942	2002-
8	US20120024576	2012-02-02	BUNDLED FLEXIBLE CIRCUIT	A flat cable includes an enclos	SU, Kuo-fu (Taoyuan County 3	ADVANCED FLEXIBLE CIRCU	12/974356	2010-
9	US20110067903	2011-03-24	BUNDLED FLEXIBLE FLAT C	A bundled flexible flat circuit c	Lin, Gwun-jin (TAOYUAN COU	ADVANCED FLEXIBLE CIRCU	12/729677	2010-
10	US20110094775	2011-04-28	DOUBLE-SIDE-CONDUCTING	Disclosed is a double-side-con	Lin, Gwun-jin (TAOYUAN COU	ADVANCED FLEXIBLE CIRCU	12/905245	2010-
11	US20110094790	2011-04-28	FLEXIBLE FLAT CIRCUIT C	A flexible flat circuit cable inclu	Lin, Gwun-jin (Taoyuan County	ADVANCED FLEXIBLE CIRCU	12/694550	2010-
12	US20120018196	2012-01-26	FLEXIBLE PRINTED CIRCUIT	Disclosed is a flexible printed c	Lin, Gwun-jin (TAOYUAN COU	ADVANCED FLEXIBLE CIRCU	12/967488	2010-
13	US20120048597	2012-03-01	BUNDLED FLEXIBLE CABLE	A bundled flexible circuit cable	Lin, Gwun-jin (TAOYUAN COU	ADVANCED FLEXIBLE CIRCU	13/176121	2011-
14	6433284	2002-08-13	Partially cut multi-planar flexib	A partially cut multi-planar flexi	Lin, Gwun-jin (Taoyuan, TW); H	Advanced Flexible Circuits Co.	09/749030	2000-
15	7615860	2009-11-10	Rigid-flex printed circuit board	A rigid-flex PCB includes at le	Su, Kuo-fu (Taoyuan, TW); Ch	Advanced Flexible Circuits Co.	11/785601	2007-
16	7875969	2011-01-25	Rigid-flex printed circuit board	A rigid-flex PCB includes at le	Su, Kuo-fu (Taoyuan, TW); Ch	Advanced Flexible Circuits Co.	12/585467	2009-
17	6538207	2003-03-25	Strain relief structures for lead	A flex circuit system has a su	Barth, Phillip W. (Portola Valle	Agilent Technologies, Inc. (Pal	10/053062	2002-
18	5835356	1998-11-10	Power substrate module	A power substrate module havi	Wieloch, Christopher J. (Brook	Allen Bradley Company, LLC (08/536877	1995-
19	5641944	1997-06-24	Power substrate with improved	A multilayer circuit board or lar	Wieloch, Christopher J. (Brook	Allen-Bradley Company, Inc. (08/536736	1995-
20	US20020009578	2002-01-24	Flexible multilayer wiring board	In a flexible multilayer wiring bo	Watanabe, Yasushi (Miyagi-ke	ALPS ELECTRIC CO., LTD.	09/907004	2001-
21	US20030102150	2003-06-05	Printed circuit board with wiring	A printed circuit board having a	Kusaka, Akihiro (Miyagi-ken, J	ALPS Electric Co., Ltd.	10/288403	2002-
22	US20040256147	2004-12-23	Electrostatic capacitive touch	On a surface of a film substrat	Shigetaka, Hiroshi (Fukushima-	ALPS ELECTRIC CO., LTD.	10/872312	2004-
23	6040529	2000-03-21	Flexible substrate	Disclosed is a flexible substrat	Takeshita, Naoki (Fukushima-	Alps Electric Co., Ltd. (Tokyo,	09/025598	1998-
24	6459044	2002-10-01	Flexible multilayer wiring board	In a flexible multilayer wiring bo	Watanabe, Yasushi (Miyagi-ke	Alps Electric Co., Ltd. (Tokyo,	09/907004	2001-
25	6479762	2002-11-12	Printed circuit board having a p	A reliable printed circuit board	Kusaka, Akihiro (Miyagi-ken, J	Alps Electric Co., Ltd. (Tokyo,	09/993437	2001-
26	7151227						2312	2004-
27	7583508						4757	2003-
28	US201200908						7537	2011-
29	5965848						8295	1997-
30	6580035						6543	1999-
31	3217283							
32	3876964						0813	1973-
33	3882264						1427	1971-
34	US200801493						4548	2006-
35	6174591						2028	1999-
36	US200902006						9376	2008-
37	US20090283300	2009-11-19	Flex Circuit with Single Sided	A flex circuit having conductive	Grunthaner, Martin Paul (San F	Apple Inc. (Cupertino, CA, US)	12/122441	2008-
38	US20110298811	2011-12-08	FLEXIBLE PRINTED CIRCUIT	Systems, methods, and device	Al-dahle, Ahmad (Santa Clara,	APPLE INC. (Cupertino, CA, U	12/792297	2010-
39	US20120195008	2012-08-02	METHOD OF MANUFACTUR	A methodology for connecting	Mcclure, Stephen R. (San Fran	Apple Inc. (Cupertino, CA, US)	13/442801	2012-
40	US20120037405	2012-02-16	FLEXIBLE CIRCUIT BOARD	An object of the present inventi	Hamazawa, Akihisa (Osaka, J	Arakawa Chemical Industries,	13/265042	2010-
41	US20060027395	2006-02-09	Flexible printed circuit board	A flexible printed circuit board	(Cho, Tsung Chieh (Taipei, TW)	Arima Computer Corporation (10/912423	2004-
42	US20080289860	2008-11-27	Flexible printed wiring board,	An object of the present inventi	Kita, Kazuhide (Joetsu-shi, JP)	Arisawa Mfg. Co., Ltd. (Joetsu-	11/805972	2007-
43	US20100186998	2010-07-29	POLYAMIDEIMIDE RESIN	The present invention provides	Tai, Makoto (Joetsu-shi, JP); U	Arisawa Mfg. Co., Ltd. (Joetsu-	12/750945	2010-
44	US20110114371	2011-05-19	COMPOSITE DOUBLE-SIDED	A double-sided copper foil sub	Lin, Chih-ming (Hsinchu, TW);	ASIA ELECTRONIC MATERIA	12/915467	2010-
45	5300899	1994-04-05	Thin, flexible, stripline flex cabl	A shielded flexible cable includ	Suski, Edward D. (Lake Fores	AST Research, Inc. (Irvine, CA	08/012547	1993-

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- Defensive Publication -- T109,201 T855019 T100001
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- Re-examination -- RX12
- Additional Improvement -- AI00,002 AI000318 AI00007

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United States Patent
Inaba

Definitely 'an older invention!'

5,759,417
June 2, 1998

Flexible circuit board and production method therefor

Abstract

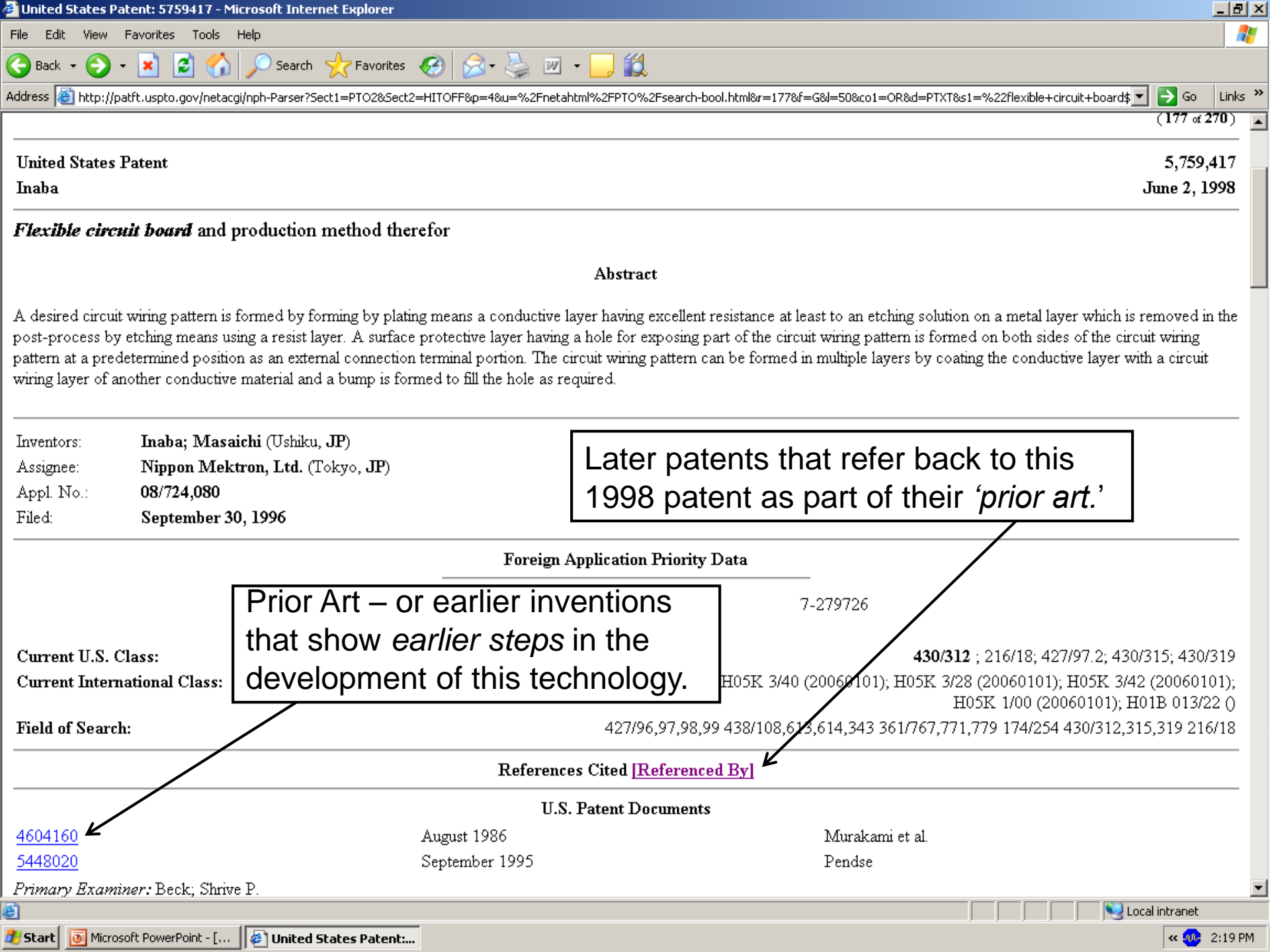
A desired circuit wiring pattern is formed by forming by plating means a conductive layer having excellent resistance at least to an etching solution on a metal layer which is removed in the post-process by etching means using a resist layer. A surface protective layer having a hole for exposing part of the circuit wiring pattern is formed on both sides of the circuit wiring pattern at a predetermined position as an external connection terminal portion. The circuit wiring pattern can be formed in multiple layers by coating the conductive layer with a circuit wiring layer of another conductive material and a bump is formed to fill the hole as required.

Inventors: **Inaba; Masaichi (Ushiku, JP)**

Assignee: **Nippon Mektron, Ltd. (Tokyo, JP)**

Appl. No.: **08/724,080**

Filed: **September 30, 1996**



United States Patent

5,759,417

Inaba

June 2, 1998

Flexible circuit board and production method therefor

Abstract

A desired circuit wiring pattern is formed by forming by plating means a conductive layer having excellent resistance at least to an etching solution on a metal layer which is removed in the post-process by etching means using a resist layer. A surface protective layer having a hole for exposing part of the circuit wiring pattern is formed on both sides of the circuit wiring pattern at a predetermined position as an external connection terminal portion. The circuit wiring pattern can be formed in multiple layers by coating the conductive layer with a circuit wiring layer of another conductive material and a bump is formed to fill the hole as required.

Inventors: **Inaba; Masaichi** (Ushiku, JP)
Assignee: **Nippon Mektron, Ltd.** (Tokyo, JP)
Appl. No.: **08/724,080**
Filed: **September 30, 1996**

Later patents that refer back to this 1998 patent as part of their 'prior art.'

Foreign Application Priority Data

Current U.S. Class: 430/312 ; 216/18; 427/97.2; 430/315; 430/319
Current International Class: H05K 3/40 (20060101); H05K 3/28 (20060101); H05K 3/42 (20060101); H05K 1/00 (20060101); H01B 013/22 ()
Field of Search: 427/96,97,98,99 438/108,613,614,343 361/767,771,779 174/254 430/312,315,319 216/18

Prior Art - or earlier inventions that show earlier steps in the development of this technology.

References Cited [Referenced By]

U.S. Patent Documents

[4604160](#) August 1986 Murakami et al.
[5448020](#) September 1995 Pendse

Primary Examiner: Beck; Shrive P.



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Keyword(s) in title or abstract: **i** hair

Publication number: **i** WO2008014520
 2008157235

Application number: **i**

Priority number: **i**

Publication date: **i** yyyyymmdd

Applicant(s): **i** Institut Pasteur

Inventor(s): **i** Smith

European Classification (ECLA): **i** F03G7/10

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★	Inventor: LANNIGAN-MACARA DEOBRAH A [US] SMITH JEFFREY A [US] (+2)	Applicant: UNIV VIRGINIA [US] LUNA INNOVATIONS INC [US] (+4)	EC: A61K31/35 A61K31/70	IPC: A61K31/35 A61K31/70	Publication info: WO 2008157235 (A1) 2008-12-24	Priority date: 2007-06-13
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2. LOW-RESTRICTION TURBINE OUTLET HOUSING

★	Inventor: WOOD TERRY G	Applicant: INTERNATL ENGINE INTELLECTUAL	EC: F01D25/30 F02B39/00	IPC: F01N13/08 F02B39/00	Publication info: JP 2008157235 (A) 2008-07-10	Priority date: 2006-12-20
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3. CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

★	Inventor: ROGERS JOHN A [US] MEITL MATTHEW [US] (+7)	Applicant:	EC: H01L21/8258 H05K1/02J6	IPC: H01L21/00 H01L29/84 H05K1/00	Publication info: US 2008157235 (A1) 2008-07-03	Priority date: 2004-06-04
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Bibliographic data: US2008157235 (A1) — 2008-07-03

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CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

Page bookmark [US2008157235 \(A1\) - CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS](#)

Inventor(s): ROGERS JOHN A [US]; MEITL MATTHEW [US]; SUN YUGANG [US]; KO HEUNG CHO [US]; CARLSON ANDREW [US]; CHOI WON MOOK [US]; STOYKOVICH MARK [US]; JIANG HANQING [US]; HUANG YONGGANG [US] ±

Applicant(s):

Classification: - international: H01L21/00; H01L29/84; H05K1/00
- European: H01L21/8258; H05K1/02J6

Application number: US20070851182 20070906

Priority number(s): US20070851182 20070906; US20050145574 20050602; US20050145542 20050602; US20060423287 20060609; US20070944626P 20070618; US20060824683P 20060906; US20040577077P 20040604; US20040601061P 20040811; US20050650305P 20050204; US20050663391P 20050318; US20050677617P 20050504; US20060790104P 20060407

Abstract of US2008157235 (A1)

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21 Languages including English!

In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed,



Refine search → Results → US2008157235 (A1) → Family page 1

Family list: US2008157235 (A1) — 2008-07-03

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Approximately **51** application(s) for: US2008157235 (A1)

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1. Methods and devices for fabricating and assembling printable semiconductor elements

★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority d
ETIENNE MENARD [US] JAE LEE KEON [US] (+3)	UNIV ILLINOIS [US]	B81C2201/0185 B82Y10/00 H01L21/02628 (+15)	B81C1/00 H01L21/00 H01L21/20 (+11)	CN101120433 (A) 2008-02-06 CN101120433 (B) 2010-12-08	2004-06-

2. Printable semiconductor structures and related methods of making and assembling

★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority d
NUZZO RALPH G ROGERS JOHN A (+8)	UNIV ILLINOIS		H01L21/302	CN101632156 (A) 2010-01-20 CN101632156 (B) 2012-06-20	2005-06-

3. Controlled buckling structures in semiconductor interconnects and nanomembranes for stretchable electronics

★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority d
ROGERS JOHN A MATTHEW MEITL (+15)	UNIV ILLINOIS [US]	B81B3/0078 B82Y10/00 H01L21/6835 (+25)	H01B7/06 H01R35/00	CN101681695 (A) 2010-03-24 CN101681695 (B) 2013-04-10	2006-09-

4. Methods and devices for fabricating and assembling printable semiconductor elements

★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority d
NUZZO RALPH G ROGERS JOHN A	UNIV ILLINOIS	B81C2201/0185 B82Y10/00	B81C1/00 H01L21/336	CN102097458 (A) 2011-06-15	2004-06-

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6. METHODS AND DEVICES FOR FABRICATING AND ASSEMBLING PRINTABLE SEMICONDUCTOR ELEMENTS

★	Inventor: NUZZO RALPH G [US] ROGERS JOHN A [US] (+6)	Applicant: UNIV ILLINOIS [US]	EC: B82Y10/00 H01L21/02K4E3L5 (+4)	IPC: B81C1/00 H01L21/02 H01L21/20 (+11)	Publication info: EP1759422 (A2) 2007-03-07 EP1759422 (A4) 2011-04-06	Priority date: 2004-06-04
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7. PRINTABLE SEMICONDUCTOR STRUCTURES AND RELATED METHODS OF MAKING AND ASSEMBLING

★	Inventor: NUZZO RALPH G [US] ROGERS JOHN A [US] (+8)	Applicant: UNIV ILLINOIS [US]	EC: B82Y10/00 H01L21/336D (+5)	IPC: H01L21/302 H01L21/8242 H01L23/62 (+2)	Publication info: EP1915774 (A2) 2008-04-30	Priority date: 2005-06-02
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8. CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

★	Inventor: ROGERS JOHN A [US] MEITL MATTHEW [US] (+15)	Applicant: UNIV ILLINOIS [US]	EC: B81B3/00S2Z B82Y10/00 (+11)	IPC: H01B7/06 H01R35/00	Publication info: EP2064710 (A2) 2009-06-03 EP2064710 (A4) 2011-05-04	Priority date: 2006-09-06
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9. PATTERN TRANSFER PRINTING BY DYNAMIC CONTROL OF ADHESION ON ELASTOMER STAMP

★	Inventor: NUZZO RALPH G ROGERS JOHN A (+6)	Applicant: UNIV ILLINOIS [US]	EC:	IPC: H01L21/02 H01L27/12	Publication info: JP2007027693 (A) 2007-02-01	Priority date: 2005-06-02
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10. SHRINKABLE SINGLE CRYSTAL SILICON FOR HIGH PERFORMANCE ELECTRONICS ON RUBBER SUBSTRATE

★	Inventor: ROGERS JOHN A KHANG DAHL-YOUNG (+1)	Applicant: UNIV ILLINOIS [US]	EC: H01L29/16G H01L29/786A	IPC: H01L21/02 H01L21/336 H01L27/12 (+1)	Publication info: JP2007281406 (A) 2007-10-25	Priority date: 2006-04-07
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11. METHODS AND DEVICES FOR FABRICATING AND ASSEMBLING PRINTABLE SEMICONDUCTOR ELEMENTS

★	Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
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11. METHODS AND DEVICES FOR FABRICATING AND ASSEMBLING PRINTABLE SEMICONDUCTOR ELEMENTS

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
		<u>B82Y10/00</u>	B81C1/00	JP2008502151 (A)	2004-06-04
		<u>H01L21/02K4E3L5</u>	H01L21/02	2008-01-24	
		(+4)	H01L21/329		
			(+13)		

12. PRINTABLE SEMICONDUCTOR STRUCTURES AND RELATED METHODS OF MAKING AND ASSEMBLING

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
			H01L21/02	JP2009508322 (A)	2005-06-02
			H01L21/336	2009-02-26	
			H01L21/338		
			(+5)		

13. CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
		<u>B81B3/00S2Z</u>	B81B3/00	JP2010503238 (A)	2006-09-06
		<u>B82Y10/00</u>	H01L21/28	2010-01-28	
		(+11)	H01L21/288		
			(+11)		

14. PATTERN TRANSFER PRINTING BY KINETIC CONTROL OF ADHESION TO AN ELASTOMERIC STAMP

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
NUZZO RALPH G [US]	UNIV ILLINOIS	<u>B82Y10/00</u>	H01L21/027	KR20060125620 (A)	2005-06-02
ROGERS JOHN A [US]	[US]	<u>H01L21/336D</u>		2006-12-06	
(+6)		(+5)		KR100798431 (B1)	
				2008-01-28	

15. METHODS AND DEVICES FOR FABRICATING AND ASSEMBLING PRINTABLE SEMICONDUCTOR ELEMENTS

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
NUZZO RALPH G [US]	UNIV ILLINOIS	<u>B82Y10/00</u>	B81C1/00	KR20070037484 (A)	2004-06-04
ROGERS JOHN A [US]	[US]	<u>H01L21/02K4E3L5</u>	H01L21/77	2007-04-04	
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Inventor(s): ROGERS JOHN A [US]; MEITL MATTHEW [US]; SUN YUGANG [US]; KO HEUNG CHO [US]; CARLSON ANDREW [US]; CHOI WON MOOK [US]; STOYKOVICH MARK [US]; JIANG HANQING [US]; HUANG YONGGANG [US] ±

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Classification:

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- European: [H01L21/8258](#); [H05K1/02J6](#)

Application number: US20070851182 20070906

Priority number(s): US20070851182 20070906; US20050145574 20050602; US20050145542 20050602; US20060423287 20060609; US20070944626P 20070618; US20060824683P 20060906; US20040577077P 20040604; US20040601061P 20040811; US20050650305P 20050204; US20050663391P 20050318; US20050677617P 20050504; US20060790104P 20060407

Abstract of US2008157235 (A1)

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- European: [H01L21/8258](#); [H05K1/02J6](#)

Application number: US20070851182 20070906

Priority number(s): US20070851182 20070906; US20050145574 20050602; US20050145542 20050602; US20060423287 20060609; US20070944626P 20070618; US20060824683P 20060906; US20040577077P 20040604; US20040601061P 20040811; US20050650305P 20050204; US20050663391P 20050318; US20050677617P 20050504; US20060790104P 20060407

Abstract of US2008157235 (A1)

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In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed,



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1. ELECTROPHYSIOLOGY IN-VIVO USING CONFORMAL ELECTRONICS

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
ROGERS JOHN A [US]	UNIV ILLINOIS [US]	A61B5/07D	A61B5/00	WO2011084450 (A1)	2009-12-16
KIM DAE-HYEONG [US]	UNIV PENNSYLVANIA [US]	A61B5/68D2	A61B5/05	2011-07-14	
(+4)	(+6)	(+4)	A61B8/12		
			(+1)		

2. SEMICONDUCTOR NANOWIRE WITH BUILT-IN STRESS

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
SEKARIC LIDIJA [US]	IBM [US]	B82Y10/00	H01L21/336	US2011104860 (A1)	2009-04-03
CHIDAMBARRAO		H01L21/335D		2011-05-05	
DURESETI [US] (+1)		(+1)		US7989233 (B2)	
				2011-08-02	

3. SYSTEMS AND METHODS FOR SELF-ASSEMBLING ORDERED THREE-DIMENSIONAL PATTERNS BY BUCKLING OF THIN FILMS BONDED TO CURVED COMPLIANT SUBSTRATES

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
CHEN XI [US]	UNIV COLUMBIA [US]		H01L29/72	WO2011050161 (A1)	2009-10-21
	CHEN XI [US]		H01L29/84	2011-04-28	

4. METHOD FOR GENERATING AN ELECTRONIC SYSTEM, METHOD FOR GENERATING A FREEFORM SURFACE HAVING SUCH A SYSTEM, AND ELECTRONIC SYSTEM AND FREEFORM SURFACE HAVING SUCH A SYSTEM

★ Inventor:	Applicant:	EC:	IPC:	Publication info:	Priority date:
LOEHER THOMAS [DE]	FRAUNHOFER GES	H05K3/28D	H05K3/28	WO2011000580 (A1)	2009-06-29
OSTMANN ANDREAS	FORSCHUNG [DE]			2011-01-06	
[DE] (+1)	UNIV BERLIN TECH [DE] (+3)				

4. METHOD FOR GENERATING AN ELECTRONIC SYSTEM, METHOD FOR GENERATING A FREEFORM SURFACE HAVING SUCH A SYSTEM, AND ELECTRONIC SYSTEM AND FREEFORM SURFACE HAVING SUCH A SYSTEM

★	Inventor: LOEHER THOMAS [DE] OSTMANN ANDREAS [DE] (+1)	Applicant: FRAUNHOFER GES FORSCHUNG [DE] UNIV BERLIN TECH [DE] (+3)	EC: H05K3/28D	IPC: H05K3/28	Publication info: WO2011000580 (A1) 2011-01-06	Priority date: 2009-06-29
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5. MASKLESS PROCESS FOR SUSPENDING AND THINNING NANOWIRES

★	Inventor: BANGSARUNTIP SARUNYA [US] COHEN GUY [US] (+1)	Applicant: IBM [US] BANGSARUNTIP SARUNYA [US] (+2)	EC: B82Y10/00 H01L21/335D (+2)	IPC: H01L29/78	Publication info: WO2010090978 (A1) 2010-08-12	Priority date: 2009-02-04
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6. INDIVIDUALLY ADDRESSABLE NANO-SCALE MECHANICAL ACTUATORS

★	Inventor: YANG JIANHUA [US] WILLIAMS R STANLEY [US] (+1)	Applicant: HEWLETT PACKARD DEVELOPMENT CO [US] YANG JIANHUA [US] (+2)	EC:	IPC: B81B7/00 B81B7/04	Publication info: WO2011002443 (A1) 2011-01-06	Priority date: 2009-06-30
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7. Reinforced Composite Stamp for Dry Transfer Printing of Semiconductor Elements

★	Inventor: MENARD ETIENNE [US]	Applicant: SEMPRIUS, INC	EC: B82Y10/00 G03F7/00A	IPC: B41K1/42	Publication info: US2010018420 (A1) 2010-01-28 US7927976 (B2) 2011-04-19	Priority date: 2008-07-23
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8. RELEASE STRATEGIES FOR MAKING TRANSFERABLE SEMICONDUCTOR STRUCTURES, DEVICES AND DEVICE COMPONENTS

★	Inventor: ROGERS JOHN A [US] NUZZO RALPH G [US] (+5)	Applicant: THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS	EC: B81C1/00F2F H01L21/78B2 (+8)	IPC: H01L21/30 H01L31/18	Publication info: US2008108171 (A1) 2008-05-08 US7932123 (B2) 2011-04-26	Priority date: 2006-09-20
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9. P-n heterojunction structure of zinc oxide-based nanorod and semiconductor thin film, preparation thereof, and nano-device comprising same

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Inventor(s): ROGERS JOHN A [US]; MEITL MATTHEW [US]; SUN YUGANG [US]; KO HEUNG CHO [US]; CARLSON ANDREW [US]; CHOI WON MOOK [US]; STOYKOVICH MARK [US]; JIANG HANQING [US]; HUANG YONGGANG [US] ±

Applicant(s):

Classification:

- international: [H01L21/00](#); [H01L29/84](#); [H05K1/00](#)
- European: [H01L21/8258](#); [H05K1/02J6](#)

Application number: US20070851182 20070906

Priority number(s): US20070851182 20070906; US20050145574 20050602; US20050145542 20050602; US20060423287 20060609; US20070944626P 20070618; US20060824683P 20060906; US20040577077P 20040604; US20040601061P 20040811; US20050650305P 20050204; US20050663391P 20050318; US20050677617P 20050504; US20060790104P 20060407

Abstract of US2008157235 (A1)

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In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed,



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(19) **United States**
 (12) **Patent Application Publication** (10) **Pub. No.: US 2008/0157235 A1**
 Rogers et al. (43) **Pub. Date: Jul. 3, 2008**

(54) **CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS**

(76) Inventors: **John A. Rogers**, Champaign, IL (US); **Matthew Meitl**, Raleigh, NC (US); **Yugang Sun**, Naperville, IL (US); **Heung Cho Ko**, Urbana, IL (US); **Andrew Carlson**, Urbana, IL (US); **Won Mook Choi**, Champaign, IL (US); **Mark Stoykovich**, Dover, NH (US); **Hanqing Jiang**, Urbana, IL (US); **Yonggang Huang**, Glencoe, IL (US)

filed on Sep. 6, 2006, provisional application No. 60/577,077, filed on Jun. 4, 2004, provisional application No. 60/601,061, filed on Aug. 11, 2004, provisional application No. 60/650,305, filed on Feb. 4, 2005, provisional application No. 60/663,391, filed on Mar. 18, 2005, provisional application No. 60/677,617, filed on May 4, 2005, provisional application No. 60/577,077, filed on Jun. 4, 2004, provisional application No. 60/601,061, filed on Aug. 11, 2004, provisional application No. 60/650,305, filed on Feb. 4, 2005, provisional application No. 60/663,391, filed on Mar. 18, 2005, provisional application No. 60/677,617, filed on May 4, 2005, provisional application No. 60/790,104, filed on Apr. 7, 2006.

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160 East 300 South, P.O. Box 45802
Salt Lake City, Utah 84145-0802
(801) 530-4849

For Further Information ..



- USPTO Information Line
800-PTO-9199
- Dave Morrison, Marriott Library,
University of Utah
801-585-6802

<http://campusguides.lib.utah.edu/content.php?pid=71473>

Questions?!



Thanks!



THE PATENT
SYSTEM ADDED THE FUEL
OF INTEREST TO THE FIRE
OF GENIUS - LINCOLN