

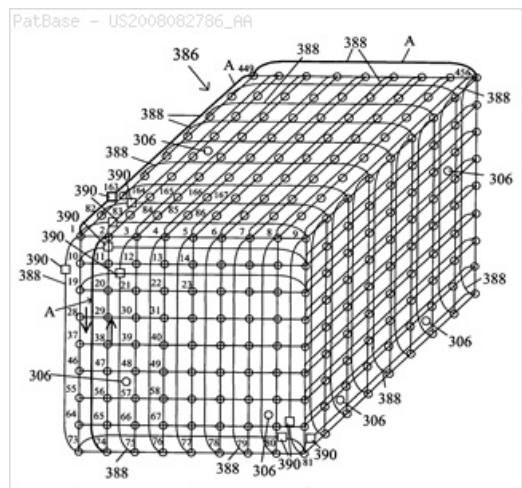
1) Family number: 41671103 (US2008082786A)

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| <b>Title:</b>                                                                     | SUPER-SCALABLE, CONTINUOUS FLOW INSTANT LOGIC(TM) BINARY CIRCUITRY ACTIVELY STRUCTURED BY CODE-GENERATED PASS TRANSISTOR INTERCONNECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
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| <b>Priority:</b>                                                                  | US20060542773 20061002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  | US20110930496 20110107 |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Family:</b>                                                                    | <table><tr><th></th><th>Publication number</th><th>Publication date</th><th>Application number</th><th>Application date</th></tr><tr><td></td><td>US2008082786 AA</td><td>20080403</td><td>US20060542773</td><td>20061002</td></tr><tr><td></td><td>US2011131392 AA</td><td>20110602</td><td>US20110930496</td><td>20110107</td></tr><tr><td></td><td>US7895560 BB</td><td>20110222</td><td>US20060542773</td><td>20061002</td></tr><tr><td></td><td>WO08042186 A2</td><td>20080410</td><td>WO2007US20773</td><td>20070925</td></tr><tr><td></td><td>WO08042186 A3</td><td>20080925</td><td>WO2007US20773</td><td>20070925</td></tr><tr><td></td><td>WO08042186 B1</td><td>20081127</td><td>WO2007US20773</td><td>20070925</td></tr></table> |                  |                        |                  |  | Publication number | Publication date | Application number | Application date |  | US2008082786 AA | 20080403 | US20060542773 | 20061002 |  | US2011131392 AA | 20110602 | US20110930496 | 20110107 |  | US7895560 BB | 20110222 | US20060542773 | 20061002 |  | WO08042186 A2 | 20080410 | WO2007US20773 | 20070925 |  | WO08042186 A3 | 20080925 | WO2007US20773 | 20070925 |  | WO08042186 B1 | 20081127 | WO2007US20773 | 20070925 |
|                                                                                   | Publication number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Publication date | Application number     | Application date |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | US2008082786 AA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20080403         | US20060542773          | 20061002         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | US2011131392 AA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20110602         | US20110930496          | 20110107         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | US7895560 BB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 20110222         | US20060542773          | 20061002         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | WO08042186 A2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20080410         | WO2007US20773          | 20070925         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | WO08042186 A3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20080925         | WO2007US20773          | 20070925         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
|  | WO08042186 B1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20081127         | WO2007US20773          | 20070925         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Probable Assignee:</b>                                                         | WEND LLC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Assignee(s):(std):</b>                                                         | LOVELL WILLIAM S ; LOVELL WILLIAM STUART                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Assignee(s):</b>                                                               | WEND LLC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Inventor(s):(std):</b>                                                         | LOVELL WILLIAM STUART ; LOVELL WILLIAM S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Agent(s):</b>                                                                  | WILLIAM S LOVELL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Designated states:</b>                                                         | AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>International class (IPC 8-9):</b>                                             | G06F15/00 G06F15/80 G06F17/50 G06F7/38 G06F9/30 (Advanced/Invention); G06F15/00 G06F7/38 (Core/Invention)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>CPC:</b>                                                                       | G06F15/76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>European class:</b>                                                            | G06F15/76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>US class:</b>                                                                  | 708/130 708/231 712/15 712/15P 712/16 712/16P 712/E9.016 712/E90.16S 716/119 716/126                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <a href="#">Classification Explorer</a>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Cited documents:</b>                                                           | US7164679 BB, US7146587 BB, US6970114 BB, US6900746 BA, US6812718 BA, US6732215 BB, US6628215 BB, US6580378 BA, US6513077 BB, US6351149 BA, US6334156 BA, US6292925 BA, US6247077 BA, US6208275 BA, US6134688 A, US6118299 A, US6044080 A, US5996020 A, US5828229 A, US5805146 A, US5752067 A, US5714768 A, US5603043 A, US5563586 A, US5543737 A, US5454653 A, US5297032 A, US5003200 A, US4870302 A, US4835770 A, US4805130 A, US4725975 A, US4684927 A, US4612620 A, US4547067 A, US4541067 A, US4412303 A, US4405884 A, US4399332 A, US4369494 A, US4360901 A, US4358690 A, US4338671 A, US4331914 A, US4295193 A, US4276029 A, US4274823 A, US4251861 A, US4229790 A, US4224532 A, US4149241 A, US4103186 A, US4100430 A, US4056780 A, US4044270 A, US4021701 A, US4011465 A, US3986042 A, US3982138 A, US3978452 A, US3973900 A, US3970993 A, US3970900 A, US3940743 A, US3940703 A, US3935475 A, US3931506 A, US3747064 A, US3601627 A, US3526783 A, US2006205354 AA, US2006202358 AA, US2006153532 AA, US2006044018 AA, US2006026578 AA, US2006007206 AA, US2005264527 AA, US2005246590 AA, US2005221233 AA, US2005199915 AA, US2005185700 AA, US2005079721 AA, US2004093480 AA, US2004054830 AA, US2003149676 AA, US2002010853 AA,        |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |
| <b>Forward Citations:</b>                                                         | WO17101136, WO10023499, USRE45388, US9779785, US9620221, US9596524, US9565487, US9454514, US8924909, US8856704, US8774200, US8739103, US8600723, US8495196, US8294396, US8233302, US8165865, US8117567, US7921399, US7823117, US7555469, US2016065429, US2016064916, US2014321853, US2013339918, US2013268904, US2013045009, US2012045204, US2011320607, US2011096582, US2011054881, US2011006713, US2010223042, US2009210850, US2009141566, US2009141530, US2008235497, US2008120260, US10523736, US10074143, US10044775, CN106777791, CN106777791, CN106201988, CN105354257,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |                                                                                   |               |          |               |          |

**Abstract:**

A processing space contains an array of operational transistors interconnected by circuit and signal pass transistors that when supplied with selected enable bits will structure a variety of circuits that will carry out any desired information processing. The Babbage/von Neumann Paradigm in which data are provided to circuitry that would operate on those data is reversed by structuring the desired circuits at the site(s) of the data, thereby to eliminate the von Neumann bottleneck and substantially increase the computing power of the device, with the apparatus conducting only non-stop Information Processing on a steady stream of data and code, with no repetitious Instruction and data transfers as in the normal computer being required. A code is defined that will identify the physical locations of every transistor in the processing space, which code will then enable only selected ones of the pass transistors therein so as to structure the circuits needed for any algorithm sought to be executed. The circuits so structured, operating independently of and in parallel with every other circuit so structured, are then restructured after each step into another group of circuits, so that almost no transistor will ever "sit idle," but all of the processing space can be devoted entirely to information processing, thereby again to increase enormously the computing power of the device. The apparatus is also super-scalable, meaning that an Instant Logic Apparatus built around that processing space could be built to have any size, speed, and level of computer power desired.



## 2) Family number: 34894143 (WO07081519A2)

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**Title:** GENIUS ADAPTIVE DESIGN

**Priority:** US20050755291P 20051230 US20060756607P 20060105 US20060778313P 20060301  
US20060783018P 20060315 US20060786906P 20060328 US20060852794P 20061018  
AU20060335151 20061219 WO2006US48704 20061219 AU20130200386 20130125

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AP200804559 A0     | 20080831         | AP20080004559      | 20061219         |
| AU2006335151 AA    | 20070719         | AU20060335151      | 20061219         |
| AU2013200386 AA    | 20130221         | AU20130200386      | 20130125         |
| CA2635954 AA       | 20080630         | CA20062635954      | 20061219         |
| CO6160255 A2       | 20100520         | CO20080079355      | 20080731         |
| EP2059899 A2       | 20090520         | EP20060849217      | 20061219         |
| EP2059899 A4       | 20120704         | EP20060849217      | 20061219         |
| IL192465 A0        | 20090922         | IL20060192465      | 20061219         |
| IN06638DN2008 A    | 20100507         | IN2008DN06638      | 20080730         |
| JP2009522654 T2    | 20090611         | JP20080548620T     | 20061219         |
| KR20080112193 A    | 20081224         | KR20087018774      | 20061219         |
| KR20130124572 A    | 20131114         | KR20137024611      | 20061219         |
| MX2008008625 A1    | 20090107         | MX20080008625      | 20061219         |
| NZ570109 A         | 20110826         | NZ20060570109      | 20061219         |
| WO07081519 A2      | 20070719         | WO2006US48704      | 20061219         |
| WO07081519 C1      | 20080612         | WO2006US48704      | 20061219         |

**Probable Assignee:** INNOVATION INST LLC

**Assignee(s):(std):** KAYS STEVEN ; STEVEN KAYS ; CABINALLA LINDA ; INNOVATION INST LLC ; WORLD CHARITY DIVISION LICENSE

**Assignee(s):** WORLD CHARITY DIVISION LICENSELTODAYCOM LLC ; INNOVATION INSTITUTE LLC ; WORLD CHARITY DIVISION LICENSELTODAY COM LLC

**Inventor(s):(std):** CABINALLA LINDA ; KAYS STEVEN

**Inventor(s):** STEVEN KAYS

**Agent(s):** SHELSTON IP; KAYS STEVEN; INNOVATION INSTITUTEION LLC; BORDEN LADNER GERVAIS LLP; MAURICIO JARAMILLO CAMPUZANO; BEETZ AND PARTNER

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT HW HN HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**International class (IPC 8-9):** E06B7/32 G06F17/00 G06F17/30 G06Q G06Q10/00 G06Q30/00 G06Q50/00 (Advanced/Invention)

**International class (IPC 1-7):** G06Q30/00

**CPC:** G06F8/70 G06F9/445 G06Q10/10 G06F16/00 G06Q30/0601

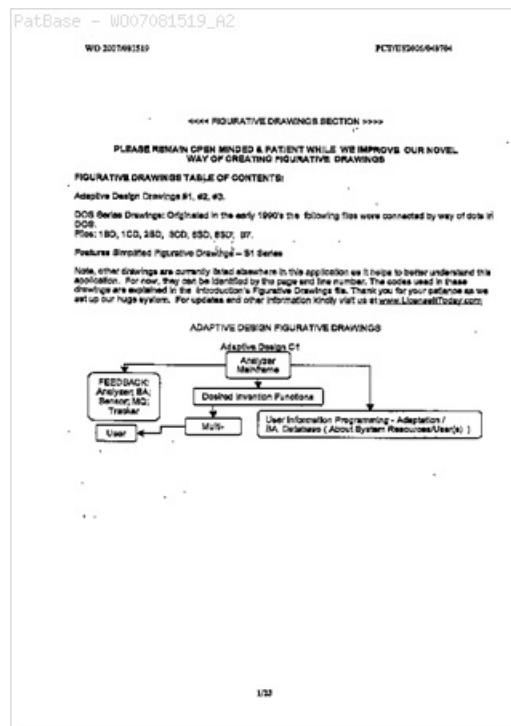
**European class:** G06Q10/10

[Classification Explorer](#)

**Forward Citations:** WO13144220, WO10091514, US9972002, US9799040, US9077848, US9067140, US9051886, US8976218, US8918083, US8878043, US8771064, US8666891, US8594721, US8332918, US8332395, US8244558, US8224375, US8219424, US7917417, US2009187429, US10586144, US10459925, US10395578,

### Abstract:

Explore interesting inventions inside, conceived by our genius idea generator. Discover history's most effective method in conceiving novel uses for existing electronic technology. License huge domains of intellectual property from the invention directory our system helped develop. The searcher can find one of our interesting inventions in this patent application via our LicenseItToday.com, etc. Call our California Headquarters 1-707-428-5000. View invention ideas, plus 100+ variations adapted for end user target markets. LicenseItToday.com fills out exclusive international license agreements valid up to December 2026. It saves time and money creative LP. over any other documented creative thinking process. Licensees seek outputted patents using our or their pat attorneys. Royalties can start when profits begin. Or you can buy the affordable I.P. rights. Proof is in tryingit out. Discover amazing inventions inside today.



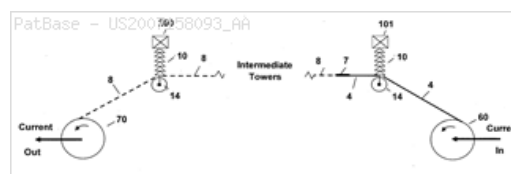
### 3) Family number: 34853270 (US2007158093A)

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| Title:                                                                                              | SYSTEMS, METHODS AND APPARATUS FOR TRANSMISSION LINE RE-CONDUCTORING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------|--|--------------------|------------------|--------------------|------------------|--------------------------------------------------------------------------------------------------|----------|---------------|----------|-----------------------------------------------------------------------------------------------------|----------|---------------|----------|--------------------------------------------------------------------------------------------------|----------|---------------|----------|---------------------------------------------------------------------------------------------------|----------|---------------|----------|
| Priority:                                                                                           | US20060757644P 20060110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    | US20070621518 20070109 WO2007US00607 20070110 |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Family:                                                                                             | <table><tr><th>Publication number</th><th>Publication date</th><th>Application number</th><th>Application date</th></tr><tr><td> CA2636708 AA</td><td>20080709</td><td>CA20072636708</td><td>20070110</td></tr><tr><td> US2007158093 AA</td><td>20070712</td><td>US20070621518</td><td>20070109</td></tr><tr><td> US7546680 BB</td><td>20090616</td><td>US20070621518</td><td>20070109</td></tr><tr><td> WO08085164 A1</td><td>20080717</td><td>WO2007US00607</td><td>20070110</td></tr></table> |                    |                                               |  | Publication number | Publication date | Application number | Application date |  CA2636708 AA | 20080709 | CA20072636708 | 20070110 |  US2007158093 AA | 20070712 | US20070621518 | 20070109 |  US7546680 BB | 20090616 | US20070621518 | 20070109 |  WO08085164 A1 | 20080717 | WO2007US00607 | 20070110 |
| Publication number                                                                                  | Publication date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Application number | Application date                              |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
|  CA2636708 AA    | 20080709                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CA20072636708      | 20070110                                      |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
|  US2007158093 AA | 20070712                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US20070621518      | 20070109                                      |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
|  US7546680 BB    | 20090616                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US20070621518      | 20070109                                      |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
|  WO08085164 A1   | 20080717                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | WO2007US00607      | 20070110                                      |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Probable Assignee:                                                                                  | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Assignee(s):(std):                                                                                  | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Inventor(s):(std):                                                                                  | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Inventor(s):                                                                                        | BARTHOLD LIONEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Agent(s):                                                                                           | GOWLING LAFLEUR HENDERSON LLP; BRIAN M DINGMAN ESQ MIRICK OCONNELL DEMALLIE AND LOUGEE LLP; DINGMAN BRIAN M; MIRICK OCONNELL DEMALLIE AND LOUGEE LLP; BRIAN M; DINGMAN BRIAN M ET AL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Designated states:                                                                                  | AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| International class (IPC 8-9):                                                                      | H01R43/00 H02G1/04 H02G7/00 H02G7/14 (Advanced/Invention);<br>H01R43/00 H02G1/04 H02G7/00 (Core/Invention)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| CPC:                                                                                                | H02G7/02 H02G1/04 B60M1/28 Y10T29/49194 Y10T29/49195 Y10T29/532 Y10T29/53243                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| European class:                                                                                     | B60M1/28 H02G1/04 H02G7/02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| US class:                                                                                           | 174/42 29/745 29/755 29/868 29/869                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| <a href="#">Classification Explorer</a>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Cited documents:                                                                                    | WO04079877 A1, WO03005516 A1, US5661903 A, US5507471 A, US5359167 A, US5297654 A, US4817682 A, US4814550 A, US4661662 A, US3708779 A, US2301266 A, US2005133244 AA, GB2313592 A1, EP1551086 A1,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |
| Forward Citations:                                                                                  | WO19148068, WO16203219, US9178340, US9112338, US8573562, US8505878, US8322689, US7977571, US2015357802, US2014217245, US2009267037, US2009206305, US2008246010, US2008054235, US10658822, CN109489881, CN105262003, CN104617536, CN104617536, CN103915807, CN103915807, CN102751668, CN102638017, CN102638017,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                               |  |                    |                  |                    |                  |                                                                                                  |          |               |          |                                                                                                     |          |               |          |                                                                                                  |          |               |          |                                                                                                   |          |               |          |

#### Abstract:

A method and associated equipment for replacing existing overhead transmission line conductors with new ones while the transmission line remains in service and carrying power. The invention uses the old conductor to pull the new conductor through a series of sheaves installed at the bottom of each tower insulator. Conventional tension-stringing principles are used to assure that both the old and new conductors maintain a safe distance from ground. To achieve this, both the pulling and tensioning (braking) equipment, as well as supply and take-up reels or drums may be elevated to power line voltage and the current is transferred between new conductor and old, while in transit to the line, by means of a brush system and a conducting wheel which may or may not be integral with pulling and tensioning equipment.



4) Family number: 31729407 (US2005133244A)

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|                  |                                                            |          |               |          |                |          |
|------------------|------------------------------------------------------------|----------|---------------|----------|----------------|----------|
| <b>Title:</b>    | LIVE CONDUCTOR STRINGING AND SPLICING METHOD AND APPARATUS |          |               |          |                |          |
| <b>Priority:</b> | US2003049870P                                              | 20030829 | EP20140189744 | 20040826 | AU20040302823  | 20040827 |
|                  | EP20040786590                                              | 20040827 | EP20060076673 | 20040827 | EP20060076675  | 20040827 |
|                  | EP20060076674                                              | 20040827 | EP20140185207 | 20040827 | EP20140189744  | 20040827 |
|                  | EP20060076680                                              | 20040827 | EP20060076676 | 20040827 | US20040498707  | 20040827 |
|                  | WO2004US27807                                              | 20040827 | US20040927467 | 20040827 | US20040498707P | 20040827 |
|                  | EP20060076673                                              | 20060905 | EP20060076675 | 20060905 | HK20060112532  | 20061114 |
|                  | US20090379729                                              | 20090227 | AU20110201704 | 20110415 | AU20120203376  | 20120608 |

| Family: | Publication number | Publication date | Application number | Application date |
|---------|--------------------|------------------|--------------------|------------------|
|         | AT463871 E         | 20100415         | AT20040076677T     | 20040827         |
|         | AT498932 E         | 20110315         | AT20040786590T     | 20040827         |
|         | AU2004302823 AA    | 20050310         | AU20040302823      | 20040827         |
|         | AU2011201704 AA    | 20110512         | AU20110201704      | 20110415         |
|         | AU2011201704 BB    | 20120308         | AU20110201704      | 20110415         |
|         | AU2012203376 AA    | 20120628         | AU20120203376      | 20120608         |
|         | CA2537218 AA       | 20060228         | CA20042537218      | 20040827         |
|         | CA2537218 C        | 20130730         | CA20042537218      | 20040827         |
|         | CN101431220 A      | 20090513         | CN200810178924     | 20040827         |
|         | CN101442195 A      | 20090527         | CN200810178963     | 20040827         |
|         | CN101483324 A      | 20090715         | CN200810178961     | 20040827         |
|         | CN101483325 A      | 20090715         | CN200810178962     | 20040827         |
|         | CN101483326 A      | 20090715         | CN200810178964     | 20040827         |
|         | CN101494360 A      | 20090729         | CN200810178927     | 20040827         |
|         | CN101505040 A      | 20090812         | CN200810178925     | 20040827         |
|         | CN101546893 A      | 20090930         | CN200810178926     | 20040827         |
|         | CN1860653 A        | 20061108         | CN200480028116     | 20040827         |
|         | CY1111890 T1       | 20151104         | CY20111100433T     | 20110504         |
|         | DE602004026487 D1  | 20100520         | DE200460026487T    | 20040827         |
|         | DE602004031432 D1  | 20110331         | DE200460031432T    | 20040827         |
|         | DE602004048615 D1  | 20160317         | DE200460048615T    | 20040827         |
|         | DE602004050093 D1  | 20161117         | DE200460050093T    | 20040827         |
|         | DE602004050942 D1  | 20170427         | DE200460050942T    | 20040827         |
|         | DK1661220 T3       | 20110523         | DK20040786590T     | 20040827         |
|         | DK1724890 T3       | 20160425         | DK20060076674T     | 20040827         |
|         | DK1724890 T3       | 20160425         | DK20040076674T     | 20040827         |
|         | DK1724892 T3       | 20160926         | DK20040076680T     | 20040827         |
|         | DK1724892 T3       | 20160926         | DK20060076680T     | 20040827         |
|         | DK1727251 T3       | 20180326         | DK20060076676T     | 20040827         |
|         | DK2849296 T3       | 20170606         | DK20140189744T     | 20040827         |
|         | DK2866320 T3       | 20170116         | DK20040185207T     | 20040827         |
|         | DK2866320 T3       | 20170116         | DK20140185207T     | 20040827         |
|         | EP1661220 A2       | 20060531         | EP20040786590      | 20040827         |
|         | EP1661220 B1       | 20110216         | EP20040786590      | 20040827         |
|         | EP1724889 A2       | 20061122         | EP20060076673      | 20040827         |
|         | EP1724889 A3       | 20140319         | EP20060076673      | 20040827         |
|         | EP1724890 A2       | 20061122         | EP20060076674      | 20040827         |
|         | EP1724890 A3       | 20140618         | EP20060076674      | 20040827         |
|         | EP1724890 B1       | 20160203         | EP20060076674      | 20040827         |
|         | EP1724891 A2       | 20061122         | EP20060076675      | 20040827         |
|         | EP1724891 A3       | 20140319         | EP20060076675      | 20040827         |
|         | EP1724892 A2       | 20061122         | EP20060076680      | 20040827         |
|         | EP1724892 A3       | 20140319         | EP20060076680      | 20040827         |
|         | EP1724892 B1       | 20160713         | EP20060076680      | 20040827         |
|         | EP1727251 A2       | 20061129         | EP20060076676      | 20040827         |
|         | EP1727251 A3       | 20100217         | EP20060076676      | 20040827         |
|         | EP1727251 B1       | 20171220         | EP20060076676      | 20040827         |
|         | EP1739803 A2       | 20070103         | EP20060076677      | 20040827         |
|         | EP1739803 A3       | 20071219         | EP20060076677      | 20040827         |
|         | EP1739803 B1       | 20100407         | EP20060076677      | 20040827         |
|         | EP1795769 A2       | 20070613         | EP20060076679      | 20040827         |
|         | EP1795769 A3       | 20071024         | EP20060076679      | 20040827         |
|         | EP1796235 A2       | 20070613         | EP20060076678      | 20040827         |
|         | EP1796235 A3       | 20100127         | EP20060076678      | 20040827         |
|         | EP2849296 A1       | 20150318         | EP20140189744      | 20040827         |
|         | EP2849296 B1       | 20170315         | EP20140189744      | 20040827         |
|         | EP2866320 A2       | 20150429         | EP20140185207      | 20040827         |
|         | EP2866320 A3       | 20150701         | EP20140185207      | 20040827         |
|         | EP2866320 B1       | 20161005         | EP20140185207      | 20040827         |
|         | ES2361318 T3       | 20110616         | ES20040786590T     | 20040827         |
|         | ES2570331 T3       | 20160517         | ES20060076674T     | 20040827         |
|         | ES2599307 T3       | 20170201         | ES20060076680T     | 20040827         |
|         | ES2617541 T3       | 20170619         | ES20140185207T     | 20040827         |
|         | ES2628238 T3       | 20170802         | ES20140189744T     | 20040827         |
|         | ES2663193 T3       | 20180411         | ES20060076676T     | 20040827         |
|         | HK1092291 A1       | 20070202         | HK20060112532      | 20061114         |

|   |                 |          |                |          |
|---|-----------------|----------|----------------|----------|
| ■ | HK1092291 A3    | 20070202 | HK20060112532  | 20061114 |
| ■ | HK1098586 A1    | 20070720 | HK20070105066  | 20061114 |
| ■ | HK1098586 A3    | 20070720 | HK20070105066  | 20061114 |
| ■ | HK1099132 A1    | 20070803 | HK20070105197  | 20061114 |
| ■ | HK1099132 A3    | 20070803 | HK20070105197  | 20061114 |
| ■ | HK1099133 A1    | 20070803 | HK20070105233  | 20061114 |
| ■ | HK1099133 A3    | 20070803 | HK20070105233  | 20061114 |
| ■ | HK1099134 A1    | 20070803 | HK20070105280  | 20061114 |
| ■ | HK1099134 A3    | 20070803 | HK20070105280  | 20061114 |
| ■ | HK1099135 A1    | 20070803 | HK20070105591  | 20061114 |
| ■ | HK1099135 A3    | 20070803 | HK20070105591  | 20061114 |
| ■ | HK1099608 A1    | 20070817 | HK20070106661  | 20061114 |
| ■ | HK1099608 A3    | 20070817 | HK20070106661  | 20061114 |
| ■ | HK1103859 A1    | 20071228 | HK20070108142  | 20061114 |
| ■ | HK1103859 A3    | 20071228 | HK20070108142  | 20061114 |
| ■ | HK1105017 A1    | 20080201 | HK20070112562  | 20061114 |
| ■ | HK1105017 A3    | 20080201 | HK20070112562  | 20061114 |
| ■ | HR20160435 T1   | 20160520 | HR20160000435  | 20160421 |
| ■ | NZ545763 A      | 20081224 | NZ20040545763  | 20040827 |
| ■ | NZ567027 A      | 20090731 | NZ20040567027  | 20040827 |
| ■ | PL1661220 T3    | 20110729 | PL20040786590T | 20040827 |
| ■ | PL1724890 T3    | 20160729 | PL20060076674T | 20040827 |
| ■ | PL1724892 T3    | 20170131 | PL20060076680T | 20040827 |
| ■ | PL1727251 T3    | 20180530 | PL20060076676T | 20040827 |
| ■ | PL2849296 T3    | 20170929 | PL20140189744T | 20040827 |
| ■ | PL2866320 T3    | 20170630 | PL20140185207T | 20040827 |
| ■ | PT1661220 T     | 20110523 | PT20040786590T | 20040827 |
| ■ | PT1724892 T     | 20161025 | PT20060076680T | 20040827 |
| ■ | PT1727251 T     | 20180226 | PT20060076676T | 20040827 |
| ■ | PT2849296 T     | 20170609 | PT20140189744T | 20040827 |
| ■ | PT2866320 T     | 20170117 | PT20140185207T | 20040827 |
| ■ | SI1661220 T1    | 20110630 | SI20040031664T | 20040827 |
| ■ | TR201604632 T4  | 20160421 | TR20160004632T | 20040827 |
| ■ | TR201613948 T4  | 20161121 | TR20160013948T | 20040827 |
| ■ | TR201619173 T4  | 20170123 | TR20160019173T | 20040827 |
| ■ | TR201706939 T4  | 20170621 | TR20170006939T | 20040827 |
| ■ | TR201723045 T4  | 20180122 | TR20170023045T | 20040827 |
| ■ | US2005133244 AA | 20050623 | US20040927467  | 20040827 |
| ■ | US2009195083 AA | 20090806 | US20090379729  | 20090227 |
| ■ | US7535132 BB    | 20090519 | US20040927467  | 20040827 |
| ■ | US8508081 BB    | 20130813 | US20090379729  | 20090227 |
| ■ | WO05022714 A2   | 20050310 | WO2004US27807  | 20040827 |
| ■ | WO05022714 A3   | 20050901 | WO2004US27807  | 20040827 |

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**Assignee(s):** BANK OF AMERICA NA ADMINISTRATIVE AGENT AS ; QUANTA SERVICES OF CANADA LTD

**Inventor(s):(std):** CLIFFORD W DEVINE ; DANIEL N O CONNELL ; DEVINE CLIFFORD W ; DEVINE CLIFFORD W O CONNELL DA ; O CONNELL DANIEL N ; O CONNELL DANIEL ; DEVINE CLIFFORD ; O CONNELL DANIEL NEIL ; DEVINE CLIFFORD WILLIAM ; DANIEL NEIL O CONNELL ; DANIEL N OCONNELL ; CLIFFORD DEVINE

**Inventor(s):** DEVINE CLIFFORD W OLIVER ; O CONNELL DANIEL N OLIVER ; O'CONNELL DANIEL NEIL ; DEVINE CLIFFORD OLIVER ; O'CONNELL DANIEL N ; O CONNELL DANIEL NEIL OLIVER

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**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**International class (IPC 8-9):** F16C F16C13/00 H01B7/00 H02G H02G1/02 H02G1/04 H02G5/00 H02G5/06 H02G7/00 H02H7/06 (Advanced/Invention); H01B7/00 H02G1/02 (Core/Invention)

**International class (IPC 1-7):** H02G1/02 H02G7/00 H02H7/06

**CPC:** H02G1/02 H02G1/04

**European class:** H02G1/02 H02G1/04

**US class:** 174/59 174/59S 174/68.2 174/68.200P 307/147 307/147P 322/29 322/29S 385/96 385/96S

[Classification Explorer](#)

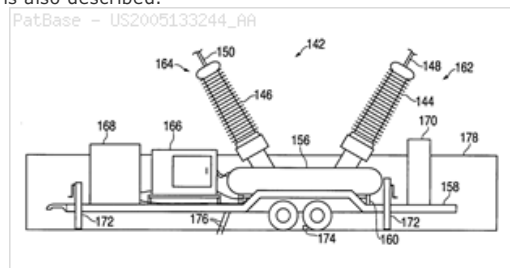
**Cited documents:** WO03005516 A1, WO03005516 A1, WO0025389 A1, WO0025389 A1, US6586697 BA, US6060972 A, US5040771 A, US5040771 A, US504077 A, US4637575 A, US4637575 A, US4562360 A, US4266184 A, US4266184 A, US4266184, US3703980 A, US3703980 A, US3199840 A, US1862254 A, JP9130933 A2, JP6327113 A2, JP4127807 A2, JP3007007 A2, JP2003224925 A2, JP2002250353 A2, JP2002234689 A2, JP2001186616 A2, JP2001186616 A2, JP10066237 A2, JP10066237 A2, GB951815 A, GB2279820 A1, GB2279820 A1, FR2698737 A1, EP0766440 A1, EP0766440 A1, EP0011973 A1, DE4416350 A1, DE19857131 A1, DE19857131 A1, DE10243183 C1,

**Forward Citations:** WO19023498, WO17173343, WO17027825, WO16164836, WO15164381, WO15131022, WO13148794, WO09049283, WO08138094, WO08138094, WO08124579, WO08085164, WO07140569, US9960575, US9882359, US9742165, US9478952, US9246314, US9112338, US9048639, US8902559, US8766098, US8755664, US8684333, US8585020, US8573562, US8505878, US8471416, US8226069, US7977571,

US7546680, US2017287665, US2016365710, US2015357802, US2015249325, US2014217245, US2012288250, US2012186853, US2010133490, US2009295235, US2009206305, US2009095522, US2008246010, US2008054235, US2007158093, US10673220, US10658822, US10644485, US10638140, US10367337, US10242830, JP5486120, JP2015019444, EP3437116, EP3335285, EP3281208, EP3148023, EP3134947, EP2814126, EP2814125, EP2596559, EP2149180, EP2149180, CN110168826, CN110137854, CN109787142, CN108028517, CN107533884, CN106663928, CN106663928, CN103683097, CN103683097, CN103500964, CN103119292, CN103119292, CN102842867, CN101958519, AU2015249876,

#### Abstract:

A method and apparatus for handling and/or stringing energized conductor for a high voltage power line conductor for a high voltage power line is provided. The method includes bringing components and workers to the same electrical potential and transferring power from one contractor to another. Associated apparatus is also described.



#### 5) Family number: 31031593 (US2004074757A)

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| <b>Title:</b>    | METHOD AND APPARATUS FOR PHASE CHANGE ENHANCEMENT |          |                |          |                |          |                |          |
| <b>Priority:</b> | US20020401813P                                    | 20020807 | US20020425820  | 20021113 | US20020425820P | 20021113 | US20020425820P | 20021113 |
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| CN101765563 B     | 20121024 | CN200880101158  | 20080606 |
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| CN1738668 A       | 20060222 | CN200380108662  | 20031113 |
| DE602004045880 D1 | 20141106 | DE200460045880T | 20040728 |
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| EP1562686 A2      | 20050817 | EP20030768953   | 20031113 |
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| IN00346CN2006 A   | 20070706 | IN2006CN00346   | 20060127 |
| IN00908CN2005 A   | 20070810 | IN2005CN00908   | 20050512 |
| IN01087CN2014 A   | 20150410 | IN2014CN01087   | 20140211 |
| IN01637CN2006 A   | 20070608 | IN2006CN01637   | 20060511 |
| IN07192CN2009 A   | 20160708 | IN2009CN07192   | 20091207 |
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| IN236982 B        | 20091204 | IN2006CN01637   | 20060511 |
| IN309566 B        | 20190329 | IN2009CN07192   | 20091207 |
| JP2006507941 T2   | 20060309 | JP20050507175T  | 20031113 |
| JP2010214372 A2   | 20100930 | JP20100112694   | 20100514 |
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| WO04043566 A2 | 20040527 | WO2003US36540 | 20031113 |
| WO04043566 A3 | 20040826 | WO2003US36540 | 20031113 |
| WO05013638 A1 | 20050210 | WO2004US24335 | 20040728 |
| WO05057015 A1 | 20050623 | WO2003US37531 | 20031124 |
| WO06096738 A2 | 20060914 | WO2006US08144 | 20060307 |
| WO06096738 A3 | 20070628 | WO2006US08144 | 20060307 |
| WO08154435 A2 | 20081218 | WO2008US66198 | 20080606 |
| WO08154435 A3 | 20090219 | WO2008US66198 | 20080606 |
| WO08154435 A9 | 20100114 | WO2008US66198 | 20080606 |
| WO10019891 A2 | 20100218 | WO2009US53898 | 20090814 |
| WO10019891 A3 | 20100624 | WO2009US53898 | 20090814 |
| WO13012744 A2 | 20130124 | WO2012US46740 | 20120713 |
| WO13012744 A3 | 20130314 | WO2012US46740 | 20120713 |
| WO14018896 A1 | 20140130 | WO2013US52335 | 20130726 |
| WO20081112 A1 | 20200423 | WO2019US24935 | 20190329 |

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**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**International class (IPC 8-9):** A23L2/52 A23L2/60 A23L2/68 A23L33/10 B01D1/00 B01D1/02 B01D1/04 B01D1/06 B01D1/22 B01D1/28 B01D1/30 B01D24/48 B01D29/01 B01D29/31 B01D29/50 B01D29/52 B01D29/60 B01D29/66 B01D29/96 B01D3/00 B01D3/02 B01D3/04 B01D3/08 B01D3/10 B01D3/14 B01D3/16 B01D3/28 B01D3/32 B01D3/34 B01D3/38 B01D3/42 B01D33/44 B01D35/12 B01D35/16 B01D35/22 B01D45/00 B01D45/08 B01D45/14 B01D53/00 B67D1/00 B67D1/08 B67D7/08 C01D3/10 C02F1/00 C02F1/02 C02F1/04 C02F1/08 C02F1/16 C02F1/18 C02F1/20 C02F1/32 C02F1/46 C02F1/48 C02F1/68 C02F9/00 C12M1/12 F01B29/10 F02C9/00 F02G1/043 F02G1/044 F02G1/053 F02G1/055 F02G1/06 F02G5/00 F02G5/04 F04B35/04 F04B49/03 F04B49/04 F04C19/00 F04C29/00 F04D1/12 F04D13/06 F04D23/00 F04D25/02 F04D29/00 F04D29/02 F04D29/057 F04D29/063 F04F5/06 F04F99/00 F16J1/14 F16J3/02 F16K1/00 F16K15/00 F16K15/03 F16K17/00 F17D3/01 F22B1/08 F22B37/18 F24H3/02 F25B1/00 F25B19/00 F25B39/00 F25B9/00 F25B9/14 F25D21/14 F28D15/00 F28D21/00 F28D7/00 F28D7/16 F28D9/00 F28F1/00 F28F1/40 F28F13/00 F28F3/00 G01D4/00 G01F9/00 G01N11/02 G01N27/10 G01N33/18 G05B15/02 G05D1/02 G05D7/00 G05D7/06 G06F11/30 G06Q50/06 H02P9/04 H04Q9/00 (Advanced/Invention); B01D1/02 B01D1/06 B01D1/28 B01D29/66 B01D3/00 B01D3/08 B01D3/10 B01D3/42 B01D45/14 B01D5/00 C02F1/08 C02F103/06 (Advanced/Non-invention); B01D1/00 B01D1/22 B01D29/01 B01D3/00 B01D3/34 B01D3/42 B01D35/00 B01D45/00 B01D5/00 B67D7/08 C02F1/04 C02F1/08 C02F1/18 C02F1/32 F01B29/00 F04C19/00 F04C29/00 F04D1/00 F16K15/02 F24H3/02 F25B1/00 F25B9/14 F28D7/00 F28D9/00 F28F1/10 H04Q9/00 (Core/Invention); B01D3/10 (Core/Non-invention)

**International class**  
(IPC 1-7):

**CPC:**

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**European class:**

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**US class:**

1/1 137/1 137/2 137/489 137/489S 137/513.5 137/527.8 137/613 15/398 15/88 159/13.2 159/13.4  
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700/287 700/302 702/188 702/188P 702/45 702/50 702/50S 702/61 702/61P 705/412 705/412S 95/1  
95/39

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**Cited documents:**

WOWP56680, WO9961125 A1, WO9940309, WO9845647 A1, WO9826246, WO9816289 A1, WO9720606  
A1, WO9318834, WO9203203 A1, WO9203203 A1, WO9105949, WO9008891, WO9005887, WO8912170  
A1, WO12024764 A1, WO08154435 A2, WO06029540 A1, WO05105254 A3, WO05105254 A2,  
WO05022145 A2, WO05013638 A1, WO04043566 A2, WO04043566, WO04015351 A1, WO04015351 A1,  
WO03078334 A1, WO03062730 A2, WO03056680 A3, WO03056680 A2, WO0202202 A3, WO0165100  
A2, WO0158814 A1, WO0152185 A2, WO0079114 A1, WO0035551 A1, USH658 H1, USH568 H1,  
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BA, US6202776 BA, US6179568 BA, US6179568 B1, US6161610 A, US6161381 A, US6142221 A,  
US6141977 A, US6113744 A, US6108685 A, US6094912 A, US6089313 A, US6083405 A, US6063267 A,  
US6062305 A, US6062023 A, US6058718 A, US6050092 A, US6039261 A, US6036267 A, US6024071 A,  
US5990199 A, US5987886 A, US5984198 A, US5976227 A, US5975840 A, US5975225 A, US5973481 A,  
US5972171 A, US5971091 A, US5971061 A, US5968321 A, US5961295 A, US5960636 A, US5960563 A,  
US5954039 A, US5952813 A, US5951856 A, US5951825 A, US5945808 A, US5937481 A, US5932092 A,  
US5932074 A, US5932073 A, US5929538 A, US5921764 A, US5920133 A, US5916490 A, US5906714 A,  
US5901568 A, US5899071 A, US5893411 A, US5881800 A, US5881411 A, US5878570 A, US5875863 A,  
US5868495 A, US5864770 A, US5859482 A, US5858177 A, US58540808, US5846414 A, US5834784 A,  
US5817224 A, US5814192 A, US5810976 A, US5810975 A, US5808277 A, US5804947 A, US5795446 A,  
US5791425 A, US5786640 A, US5776334 A, US5772850 A, US5771694 A, US5761985 A, US5761903 A,  
US5755970 A, US5755100 A, US5743091 A, US5740834 A, US5738766 A, US5735681 A, US5729987 A,  
US5725778 A, US5722255 A, US5710536 A, US5701965 A, US5697430 A, US5695092 A, US5683586 A,  
US5683579 A, US5682845 A, US5676805 A, US5675974 A, US5673721 A, US5670041 A, US5667683 A,  
US5667543 A, US5653582 A, US5647973 A, US5645694 A, US5645694 A, US5645124 A, US5642618 A,  
US5641410 A, US5614086 A, US5606723 A, US5599429 A, US5597453 A, US5596262 A, US5591317 A,  
US5590626 A, US5590528 A, US5590526 A, US5587054 A, US5580448 A, US5565065 A, US5558687 A,  
US55516 A, US5544963 A, US5534118 A, US5522214 A, US5516706 A, US5514283 A, US5513697 A,  
US5507625 A, US5496448 A, US5494135 A, US5472738 A, US5468350 A, US5459812 A, US5456823 A,  
US5445729 A, US5443739 A, US5441606 A, US5441401 A, US5421823 A, US5417805 A, US5415223 A,  
US5411640 A, US5409576 A, US5395215 A, US5389242 A, US5370502 A, US5366036 A, US5350519 A,  
US5350357 A, US5340443 A, US5317882 A, US5295794 A, US5294303 A, US5293853 A, US5286350 A,  
US5271454 A, US5266170 A, US5251593 A, US5251593, US5248245 A, US5246541 A, US5238369 A,  
US5236555 A, US5228293 A, US5222869 A, US5221439 A, US5217352 A, US5217065 A, US5203970 A,  
US5203170 A, US5199722 A, US5197863 A, US5185501 A, US5178734 A, US51780800, US5177968 A,  
US5174117 A, US5172784 A, US51724500, US5171431 A, US5169502 A, US5168947 A, US5161374 A,  
US5156706 A, US5148066 A, US5131277 A, US5127926 A, US5116473 A, US5111899 A, US5108548 A,  
US5102503 A, US5101791 A, US5100300 A, US5095701 A, US5090887 A, US5088515 A, US5074998 A,

US5074114 A, US5073177 A, US5069272 A, US5065579 A, US5061376 A, US5054547 A, US5053110 A, US5046554 A, US5046331 A, US5045155 A, US5037955 A, US5005349 A, US5003777 A, US4996841 A, US4994097 A, US4984432 A, US4977742 A, US4976162 A, US4957200 A, US4948514 A, US4948432 A, US4947983 A, US4946349 A, US4940406 A, US4925526 A, US4901790 A, US4898041 A, US4894123 A, US4893672 A, US4890988 A, US488373 A, US4882012 A, US4881372 A, US4880504 A, US4877489 A, US4869067 A, US4857144 A, US4844789 A, US4830757 A, US4826482 A, US4824149 A, US4822455 A, US4809804 A, US4808161 A, US4799542 A, US4779990 A, US4779421 A, US4776171 A, US4768341 A, US4756797 A, US4752697 A, US4751819 A, US4747752 A, US4736586 A, US4735728 A, US4734167 A, US4731159 A, US4707220 A, US4695062 A, US4692414 A, US4686009 A, US4676202 A, US4671856 A, US4662176 A, US4659460 A, US4642547 A, US4638633 A, US4636283 A, US4633667 A, US4618399 A, US4597835 A, US4587518 A, US4586985 A, US4585523 A, US4577604 A, US4573320 A, US4572287 A, US4565177 A, US4561940 A, US4551070 A, US4539076 A, US4538677 A, US4538573 A, US4537039 A, US4536258 A, US4533265 A, US4532985 A, US4532765 A, US4527394 A, US4522030 A, US4521161 A, US4520868 A, US4520868 A, US4511805 A, US4511436 A, US4511070 A, US4509464 A, US4491798 A, US4489242 A, US4470449 A, US4450754 A, US4448461 A, US4445570 A, US4444675 A, US4442670 A, US4437933 A, US4434617 A, US4433846 A, US4428630 A, US4428328 A, US4423766 A, US4416114 A, US4413475 A, US4410302 A, US4387568 A, US4384672 A, US4384457 A, US4381648 A, US4364724 A, US4358268 A, US4343350 A, US4342625 A, US4330992 A, US4330260 A, US4327550 A, US4325781 A, US4321222 A, US4317787 A, US4317786 A, US4316774 A, US4313305 A, US4313243 A, US4313080 A, US4309243 A, US4307572 A, US4305457 A, US4275448 A, US4265263 A, US4260461 A, US4259160 A, US42582002 P, US4258160 A, US4255929 A, US4255122 A, US4248296 A, US4239603 A, US4232734 A, US4231222 A, US4199537 A, US4199527 A, US4191241 A, US4179891 A, US4172363 A, US4169692 A, US4168211 A, US4159227 A, US4159227 A, US4154642 A, US4148211 A, US4134939 A, US4106560 A, US4085588 A, US4070871 A, US4069670 A, US4067191 A, US4057034 A, US4052267 A, US4045293 A, US4041592 A, US4032391 A, US4030985 A, US4028179 A, US4020635 A, US4008039 A, US4005349 A, US4002538 A, US4002072 A, US3997408 A, US399665 A, US3996314 A, US3991586 A, US3980526 A, US3956892 A, US3956073, US3956072 A, US3956072 A, US3956072, US3950216 A, US3940933 A, US3940932 A, US3930959 A, US3924477 A, US3913314 A, US3911694 A, US3904122 A, US3901475 A, US3891496 A, US388654 A, US3861223 A, US3860384 A, US3859794 A, US3849101 A, US3846254 A, US3838774 A, US3820014 A, US3816266 A, US3807912 A, US3789617 A, US3787457 A, US3782457 A, US3775973 A, US3753335 A, US3742578 A, US3724523 A, US3713538 A, US3687817 A, US3635283 A, US3607636 A, US3603082 A, US3583830 A, US3572379 A, US3542197 A, US3493468 A, US3480513 A, US3477226 A, US3456952 A, US3455791 A, US3431788 A, US3390057 A, US3372095 A, US3366314 A, US3332468 A, US3293480 A, US327875 A, US3266566 A, US3265115 A, US3243359 A, US321313 A, US3183174 A, US3097896 A, US3094133 A, US3094133 A, US3092091 A, US3059418 A, US2966382 A, US2924292 A, US2891496 A, US2863501 A, US2830832 A, US2800411 A, US2791891 A, US2766929 A, US2712520 A, US2688228 A, US2644308 A, US2595457 A, US2564100 A, US2539699 A, US2532267 A, US2453375 A, US2449587 A, US2419234 A, US2390436 A, US2337294 A, US2289984 A, US2256201 A, US2176657 A, US2170099 A, US2155278 A, US2142747 A, US2132150 A, US2067049 A, US2015224419 AA, US2015075967 AA, US2015005699 AA, US201313952263, US2011147194 AA, US2011023504 AA, US2010292944 AA, US2010275779 AA, US2010101929 AA, US2010065414 AA, US2009159612 AA, US2009026061 AA, US2009025399 AA, US2008314356 AA, US2008227931 AA, US2008133181 AA, US2008105610 AA, US2008105533 AA, US2008105532 AA, US2008105530 AA, US2008105403 AA, US2008092536 AA, US2008083231 AA, US2008035201 AA, US2008030204 AA, US2007112530 AA, US2007028612 AA, 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US1440558 A, US1413521 A, US1386020 A, US1371784 A, US1324515 A, US124805 A, US120222 A, US1179097 A, US1089651 A, US10585408, US10005001 BB, NL892962, NL704002, NL689484, NL675161, KR20060023299 A, KR20060023299 A, KR20060015451 A, KR20060015451 A, KR20040050853, KR19990084233 A, KR19990084233 A, KR19970045639, JPS6380469 U, JPS6380469, JPS6250701 U, JPS6250701, JPS62265486, JPS59216601, JPS5895201 U, JPS582494, JPS5672285, JPM530, JPM247, JPM1066, JPM0989, JPM0956, JP989, JP956, JP9136001 A2, JP9136001, JP9015197, JP9, JP2293334 A2, JP7189972 A2, JP7189972 A2, JP7151402, JP7151084 A2, JP7151084, JP63080469 U1, JP63080469 U1, JP63080469 A2, JP63080469 A2, JP63068759 A2, JP62265486 A2, JP62265486, JP62050701 U1, JP62050701 U1, JP62050701 U, JP62050701 U, JP62050701 A2, JP62013229, JP61128024, JP61128014, JP60193292 U1, JP60193292 U1, JP60193292 U, JP59216601 A2, JP58117995, JP58095201 U1, JP58095201 U, JP58024398, JP58002494 A2, JP58002494, JP56133597, JP56081177 A2, JP56081177, 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WO20081112, WO20065311, WO20026239, WO19087134, WO19086979, WO18132018, WO17063002, WO17062979, WO17062874, WO16092906, WO16044535, WO15104562, WO15042102, WO15021062, WO14196611, WO14099250, WO14047280, WO14018896, WO13152308, WO13152308, WO13150318, WO13012744, WO12170900, WO12142232, WO11153626, WO11153626, WO11127573, WO10104601, WO10089478, WO10019891, WO09049316, WO08154435, WO08154435, WO08115578, WO08058242, WO08058242, WO07084626, WO07084626, WO06096738, WO06096738, WO06022750, US9970559, US9969638, US9962486, US9958878, US9937435, US9936596, US9934670, US9908061, US9907897, US9902000, US9897385, US9863282, US9861733, US9857096, US9835292, US9816410, US9808463, US9783431, US9772141, US9770673, US9752460, US9751026, US9719526, US9702585, US9695826, US9689593, US9677819, US9676708, US9651296, US9638065, US9617167, US9610518, US9604861, US9604858, US9593809, US9572454, US9565870, US9555186, US9528737, US9482432, US9476022, US9475996, US9474993, US9458738, US9451792, US9441504, US9410449, US9404654, US9389026,

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EP3359641, EP3217014, EP3217014, EP3020418, EP2963056, EP2833982, EP2819426, EP2675754, EP2564911, EP2564911, EP2564911, EP2532401, EP2464434, EP2464434, EP2406485, EP2365850, EP2365850, EP2158161, EP2038037, CN110395838, CN109630433, CN108474358, CN108474358, CN108079605, CN107872961, CN107512752, CN107076149, CN106651845, CN106651845, CN105363227, CN105154688, CN105154688, CN105132689, CN105091632, CN105091632, CN104271211, CN104271211, CN104084357, CN104084357, CN103781523, CN103781523, CN103748042, CN103553163, CN103332712, CN102531156, CN102218222, CN101990603, CN101990603, CN101888967, CN101888967, CN101434419, AU2012284251, AU2012217794,

**Abstract:**

A method and device for enhancing distillation in an evaporator. The evaporator includes phase change chambers, such as vertically-oriented cylindrical evaporation tubes. Each chamber has an evaporation region that can be heated externally. Each chamber has an inlet for introducing liquid to the chamber and an outlet opening for allowing vapor to exit from the chamber. Packing is inserted into one or more chambers to enhance distillation. The packing may include a rod with bristles emanating from the rod. Other chamber packing may include multiple rods or a mesh.

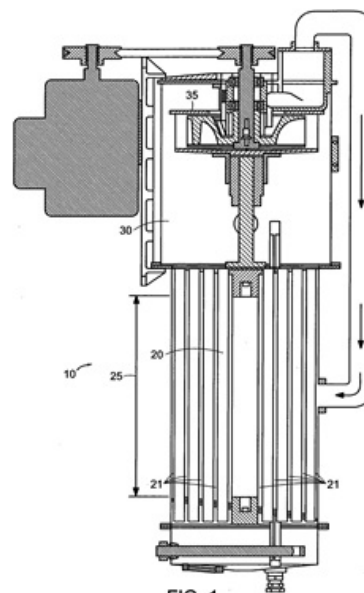


FIG. 1

## 6) Family number: 64905780 (US2017047716A)

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**Title:** LIVE CONDUCTOR STRINGING, MAINTENANCE AND REPAIR METHOD  
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| AR105696 AA        | 20171101         | AR2016P102487      | 20160812         |
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| AU2016305079 AH    | 20181213         | AU20160305079      | 20160812         |
| BR112018002820 A2  | 20181002         | BR20181102820      | 20160812         |
| BR112018002820 A8  | 20190813         | BR20181102820      | 20160812         |
| CA2995402 AA       | 20180209         | CA20162995402      | 20160812         |
| CL2018000386 A1    | 20180727         | CL20180000386      | 20180212         |
| CN108028517 A      | 20180511         | CN201680054567     | 20160812         |
| CO20180001311 A2   | 20180419         | CO20180001311      | 20180208         |
| CR20180095 A       | 20180403         | CR20180000095      | 20160812         |
| DOP2018000044 A    | 20180515         | DO20180000044      | 20180212         |
| EP3335285 A1       | 20180620         | EP20160835992      | 20160812         |
| EP3335285 A4       | 20190403         | EP20160835992      | 20160812         |
| HK1251727 A1       | 20190201         | HK20180110866      | 20180823         |
| IN201827008430 A   | 20180518         | IN201827008430     | 20180307         |
| MX2018001817 A1    | 20180516         | MX20180001817      | 20160812         |
| PE08452018 A1      | 20180516         | PE20180000232      | 20160812         |
| PE20180845 A1      | 20180516         | PE20180000232      | 20160812         |
| PH2018500314 A     | 20180813         | PH20180500314      | 20180212         |
| US2017047716 AA    | 20170216         | US20160236002      | 20160812         |
| US10644485 BB      | 20200505         | US20160236002      | 20160812         |
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**Inventor(s):** O U0027CONNELL DANIEL NEIL

**Agent(s):** AJ PARK; EDWARDS ANTONY C; ESTUDIO CAREY LTDA; JOSE ANDRES RINCON USCATEGUI; WILLIAMS POWELL; CHLOE LEE AND CO; EDWARDS ANTHONY C; OATHOUT MARK A; OATHOUT LAW FIRM

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(IPC 8-9):

**International class** H02G1/02 H02G7/00  
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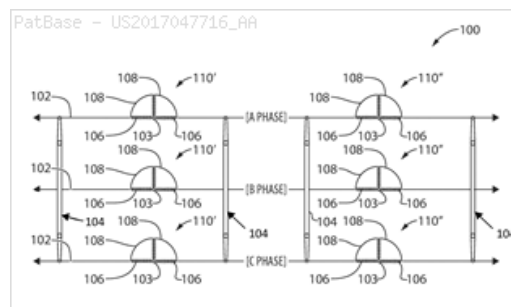
[Classification Explorer](#)

**Cited documents:** US9478952 BB, US8573562 BB, US8505878 BB, US7977571 BB, US7535132 BB, US6191354 BA, US6060972 A, US2017047716 AA, US2015249325 AA, US2009295235 AA, US2009195083 AA, US2009095522 AA, US10367337 BB, CN203445520 U, CN1860653 A,

**Forward Citations:** US10644485,

#### Abstract:

The present invention relates to replacing conductors in a high-voltage power transfer system. The method provides, for example, a method for maintaining sections of electrically conductive phases in a three-phase power conductor line, wherein the three phases are parallel and spaced apart in an ordered sequence. The phases are strung between support structures and supported above the ground. Maintenance work, which include replacement or repair, is performed on sections of the three phases without interrupting a power load in any one of the three phases and without transposing the relative positions of the phases out of their ordered sequence.



#### 7) Family number: 43143880 (US2009095522A)

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**Title:** ROBOTIC BYPASS SYSTEM AND METHOD

**Priority:** US20070979454P 20071012 US20080250082 20081013

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2009095522 AA    | 20090416         | US20080250082      | 20081013         |
| WO09049283 A1      | 20090416         | WO2008US79692      | 20081013         |

**Probable Assignee:** BARTHOLD LIONEL O

**Assignee(s):(std):** BARTHOLD LIONEL O

**Inventor(s):(std):** BARTHOLD LIONEL O

**Agent(s):** MIRICK OCONNELL DEMALLIE AND LOUGEE LLP; DINGMAN BRIAN M ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**International class** F16L3/00 H02G7/05 (Advanced/Invention);  
(IPC 8-9): F16L3/00 H02G7/00 (Core/Invention)

**CPC:** H02G1/04

**European class:** H02G1/04

**US class:** 174/40TD

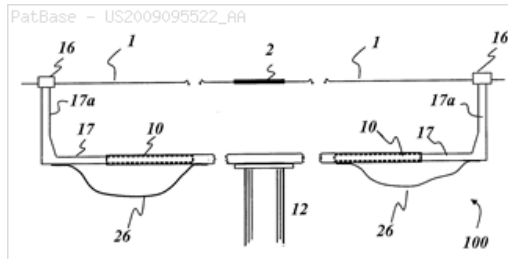
[Classification Explorer](#)

**Cited documents:** US5613286 A, US5538207 A, US2005133244 AA,

**Forward Citations:** WO17173343, WO17027825, WO16164836, WO13182235, US9997896, US9938117, US9112338, US9038989, US8763973, US8585020, US8573562, US2015357802, US2014217245, US2014097302, US2014069717, US2012286108, US2009206305, US10658822, US10367337, US10242830, EP3437116, EP3335285, EP3281208, EP3134947, EP2859630, CN108028517, CN107533884, CN106663928, CN106099758, CN106099758, AU2015249876,

#### Abstract:

A system and method, and robotic equipment for mechanical and/or electrical bypassing of short sections of energized high voltage line conductors by gripping the conductor at two close-by points, making good electrical and mechanical connection, then drawing the two points towards one another so as to relieve both mechanical and current-carrying duty of the bypassed conductor section. Doing so can provide slack on the bypassed conductor section for maintenance or repair while simultaneously providing an alternative path for electric current, or increase tension on the adjacent conductor sections by essentially shortening the conductor in the region where the invention is applied. The invention may then reverse direction, placing (stretch) tension on the bypassed conductor section and the point of repair to assure its mechanical integrity. Mechanical bypassing only to temporarily shorten specific conductor spans may be achieved by the same device. Electrical bypassing only may be achieved in a similar manner by gripping and bridging two separate high voltage conductors, thus providing a means to connect and/or disconnect them with the aid of switching equipment incorporated into the invention. The invention allows all of the foregoing to be accomplished at line potential and in close line proximity by virtue of its being mounted on an insulated boom or suspended from a hovering helicopter or suspended from the line itself.



# 8) Family number: 67137907 (US2017287665A)

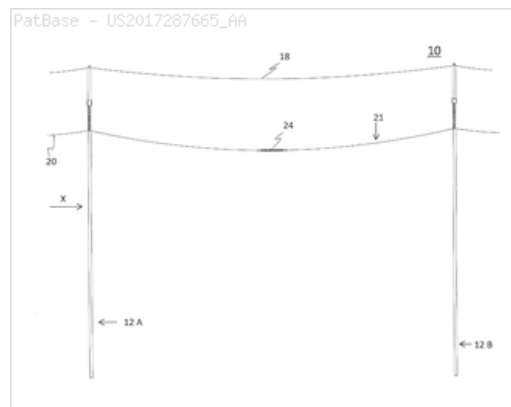
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**Title:** BOOM MOUNTABLE BREAKER AND METHODS OF USING SAME  
**Priority:** US20160316232P 20160331 US20170475689 20170331 WO2017US25502 20170331  
CL20180002773 20180928 US20190363731 20190325

| Family: | Publication number | Publication date | Application number | Application date |
|---------|--------------------|------------------|--------------------|------------------|
|         | AR108042 AA        | 20180711         | AR2017P100790      | 20170330         |
|         | AU2017240144 AA    | 20181025         | AU20170240144      | 20170331         |
|         | BR112018070151 A2  | 20190430         | BR20181170151      | 20170331         |
|         | CA3019136 AA       | 20180926         | CA20173019136      | 20170331         |
|         | CL2018002773 A1    | 20190201         | CL20180002773      | 20180928         |
|         | CL2019001847 A1    | 20191129         | CL20190001847      | 20190704         |
|         | CL59078 B          | 20200416         | CL20180002773      | 20180928         |
|         | CN109074994 A      | 20181221         | CN201780025390     | 20170331         |
|         | CN109074994 B      | 20200310         | CN201780025390     | 20170331         |
|         | CO20180010336 A2   | 20181214         | CO20180010336      | 20180926         |
|         | CR20180458 A       | 20190109         | CR20180000458      | 20170331         |
|         | DOP2018000210 A    | 20190115         | DO20180000210      | 20180928         |
|         | EP3437116 A2       | 20190206         | EP20170776829      | 20170331         |
|         | EP3437116 A4       | 20191120         | EP20170776829      | 20170331         |
|         | HK1261685 A1       | 20200103         | HK20190121570      | 20190328         |
|         | IN201827036715 A   | 20190802         | IN201827036715     | 20180928         |
|         | MX2018011866 A1    | 20190213         | MX20180011866      | 20170331         |
|         | US2017287665 AA    | 20171005         | US20170475689      | 20170331         |
|         | US2019221393 AA    | 20190718         | US20190363731      | 20190325         |
|         | US10242830 BB      | 20190326         | US20170475689      | 20170331         |
|         | WO17173343 A2      | 20171005         | WO2017US25502      | 20170331         |
|         | WO17173343 A3      | 20171102         | WO2017US25502      | 20170331         |

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**Inventor(s):(std):** DANIEL NEIL O CONNELL ; DAVID KARL WABNEGGER ; O CONNELL DANIEL NEIL ; OCONNELL DANIEL NEIL ; WABNEGGER DAVID KARL  
**Inventor(s):** O U0027CONNELL DANIEL NEIL  
**Agent(s):** AJ PARK; EDWARDS ANTONY C; ESTUDIO CAREY LTDA; WILLIAMS POWELL; CHLOE LEE AND CO; OATHOUT MARK A; OATHOUT LAW FIRM  
**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW  
**International class (IPC 8-9):** A61N5/00 H01H H01H71/02 H01H71/10 H02G H02G1/02 H02G1/04 H02G7/05 (Advanced/Invention); B66C1/42 B66C23/66 (Advanced/Non-invention)  
**International class (IPC 1-7):** H01H71/10 H02G1/02 H02G1/04 H02G7/05  
**CPC:** H02G1/02 H02G1/04 B66C1/42 B66C23/66 H01H71/0264 H01H71/10  
**US class:** 1/1 200/293  
[Classification Explorer](#)  
**Cited documents:** US9038989 BB, US8684333 BB, US8226069 BB, US7535132 BB, US6770832 BB, US5538207 A, US2014069717 AA, US2012175575 AA, US2009095522 AA, US2005133244 AA, CN204332860 U, CN201126800 Y, CN1452204 A,  
**Forward Citations:** US10254501,

**Abstract:**  
A boom mountable breaker system and a method of using same for interrupting electrical transmission through a portion of an energized conductor downstream of a desired break location. The method includes: mounting the jumper onto the energized conductor across the desired break location so as to form an electrically conductive first parallel electrical path; installing an in-line opener in the energized conductor at the desired break location on the energized conductor; positioning the breaker at the desired break location on the energized conductor, and electrically connecting the breaker, while open, across the desired break location and across the opposite ends of the jumper so as to form a second parallel electrical path when the breaker is closed; closing the breaker to thereby complete the second parallel electrical path; removing the jumper from across the desired break location; and, opening and then removing the breaker.



## 9) Family number: 42269983 (US2008246010A)

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| Title:                                                                            | APPARATUS AND METHOD FOR ENHANCING THE RECONDUCTORING OF OVERHEAD ELECTRIC POWER LINES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|------------------|--|--------------------|------------------|--------------------|------------------|-----------------------------------------------------------------------------------|-----------------|----------|---------------|----------|-----------------------------------------------------------------------------------|--------------|----------|---------------|----------|-----------------------------------------------------------------------------------|---------------|----------|---------------|----------|
| Priority:                                                                         | US20070910259P 20070405                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  | US20080062672 20080404 |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Family:                                                                           | <table><tr><th></th><th>Publication number</th><th>Publication date</th><th>Application number</th><th>Application date</th></tr><tr><td></td><td>US2008246010 AA</td><td>20081009</td><td>US20080062672</td><td>20080404</td></tr><tr><td></td><td>US8505878 BB</td><td>20130813</td><td>US20080062672</td><td>20080404</td></tr><tr><td></td><td>WO08124579 A1</td><td>20081016</td><td>WO2008US59393</td><td>20080404</td></tr></table> |                  |                        |                  |  | Publication number | Publication date | Application number | Application date |  | US2008246010 AA | 20081009 | US20080062672 | 20080404 |  | US8505878 BB | 20130813 | US20080062672 | 20080404 |  | WO08124579 A1 | 20081016 | WO2008US59393 | 20080404 |
|                                                                                   | Publication number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Publication date | Application number     | Application date |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
|  | US2008246010 AA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20081009         | US20080062672          | 20080404         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
|  | US8505878 BB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 20130813         | US20080062672          | 20080404         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
|  | WO08124579 A1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20081016         | WO2008US59393          | 20080404         |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Probable Assignee:                                                                | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Assignee(s):(std):                                                                | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Inventor(s):(std):                                                                | BARTHOLD LIONEL O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Agent(s):                                                                         | MIRICK OCONNELL DEMALLIE AND LOUGEE LLP; BRIAN M; DINGMAN IP LAW PC; DINGMAN BRIAN M ET AL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Designated states:                                                                | AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW                                                                                                                                                                                                                                                                    |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| International class (IPC 8-9):                                                    | B63B35/03 B65H59/00 E21C29/16 H01R43/00 H02G1/02 H02G1/04 H02G1/08 H02G7/20 (Advanced/Invention); H02G1/04 (Advanced/Non-invention); H02G1/04 H02G7/20 (Core/Invention)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| CPC:                                                                              | Y10T29/49194 H02G1/04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| European class:                                                                   | H02G1/04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| US class:                                                                         | 254/134.30RP 254/134.3PA 254/134.3R 254/214 29/868                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| <a href="#">Classification Explorer</a>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Cited documents:                                                                  | WO04079877 A1, US7882630 BB, US7546680 BB, US7535132 BB, US7353602 BB, US6837671 BB, US6325749 BA, US5661903 A, US5538207 A, US5029816 A, US4814550 A, US4661662 A, US4596379 A, US4531714 A, US4343443 A, US3753284 A, US3708779 A, US3271009 A, US3137765 A, US3073574 A, US3030075 A, US2929136 A, US2680394 A, US2188715 A, US2009206305 AA, US2009195083 AA, US2008246010 AA, US2007056463 AA, US2006033463 AA, US2005133244 AA, US2003098450 AA, US2002100898 AA, US1520628 A,                                                                                                                                                                                                          |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |
| Forward Citations:                                                                | WO20070764, WO17027825, WO16203219, WO16164836, WO16023141, WO15164381, WO13148794, US9938117, US9882359, US9742165, US9246314, US9112338, US9048639, US8573562, US8505878, US2015357802, US2015249325, US2015030426, US2014217245, US2009206305, US10658822, US10644485, US10367337, KR101167612, EP3196998, EP3109959, EP3109959, CN107533884, CN106663928, CN106663928, CN102638017, CN102638017.                                                                                                                                                                                                                                                                                          |                  |                        |                  |  |                    |                  |                    |                  |                                                                                   |                 |          |               |          |                                                                                   |              |          |               |          |                                                                                   |               |          |               |          |

### Abstract:

Equipment and associated methods for replacing existing overhead transmission line conductors with new ones while the transmission line remains in service and carrying power. The old conductor is used to pull the new conductor through a series of sheaves installed at the bottom of the insulator at each tower. Conventional tension-stringing equipment is used but it is elevated to line potential that is achieved by use of an insulating platform or insulating jacks. Current transfer between stationary and moving conductors is achieved by a current transfer device that may consist of transmission line contacting wheels and liquid metal contactors. Sag control in various conductor spans is enhanced by a stringing block with controllable friction. Equipment is also introduced which will prevent release of the conductor by the pulling device should it break while engaged by that device.

