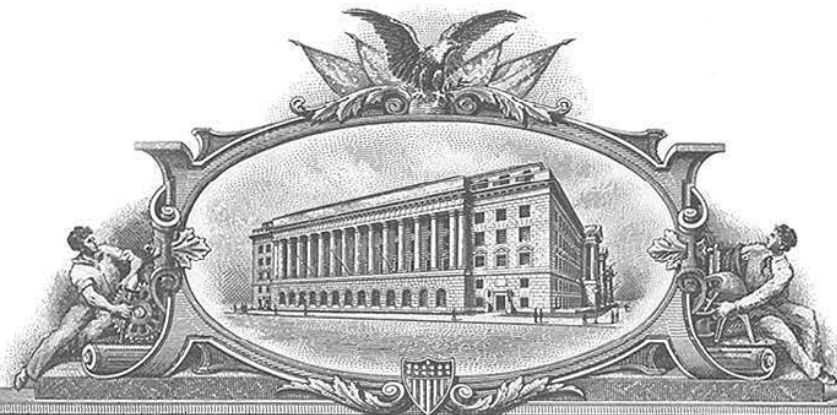


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	Filing Date		2013-10-04
	First Named Inventor	Nicholas B. LARSSON et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	C64.12-0053	

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	Art Unit			
	Examiner Name			
Attorney Docket Number		C64.12-0053		

	1	2006195498	JP		2006-07-27	SHODENSHA CO LTD et al.	English translation of Abstract attached.	☒
	2	2009109729	JP		2009-05-21	NITTO ELECTRIC WORKS LTD	English translation of Abstract attached.	☒

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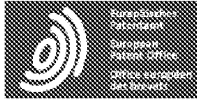
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**Espacenet****Bibliographic data: JP2006195498 (A) — 2006-07-27****OPTICAL CABLE CONNECTION BOX**

No documents available for this priority number.

Inventor(s): NAKANO TAKEYUKI; TAKEDA TOSHIAKI; NAKAZAWA KENICHI ±
(NAKANO TAKEYUKI, ; TAKEDA TOSHIAKI, ; NAKAZAWA KENICHI)**Applicant(s):** SHODENSHA CO LTD; NIPPON TELEGRAPH & TELEPHONE ±
(SHODENSHA CO LTD, ; NIPPON TELEGR & TELEPH CORP
<NTT>)**Classification:** - **international:** **G02B6/00**
- **cooperative:****Application number:** JP20060117485 20060421**Priority number(s):** JP20060117485 20060421**Also published as:** JP3983261 (B2)**Abstract of JP2006195498 (A)**

PROBLEM TO BE SOLVED: To make a joint box adaptable to change in a required length of a cable outside the joint box by increasing the degree of freedom in the introducing direction of an optical cable and by enabling change of the introducing direction as well as change of the optical cable array. ; SOLUTION: A lower case 10 is provided, as is an upper case 12 that is connected to the lower case with a hinge and stacked thereon. In the lower case 10, there are installed a plurality of cable holding units 22 so that optical cables 14A, 14B can be introduced from different directions to a plurality of peripheral places, and a cable storing part 28 so that the introduced optical cables can be wound in the same direction and stored without removing the jacket. The upper case 12 is composed of a lower layer tray 12A and an upper layer tray 12B stacked thereon. In the lower layer tray 12A, a cable pull-in part 30 is installed in which an optical cable coming up from the lower case 10 is pulled in. In the upper layer tray 12B, a coated fiber storing part is installed in which a coated optical fiber coming up from the lower layer tray and the connecting part thereof are housed. ; COPYRIGHT: (C)2006,JPO&NCIP

Last updated: 23.09.2013 Worldwide Database 5 8.11.4; 83p

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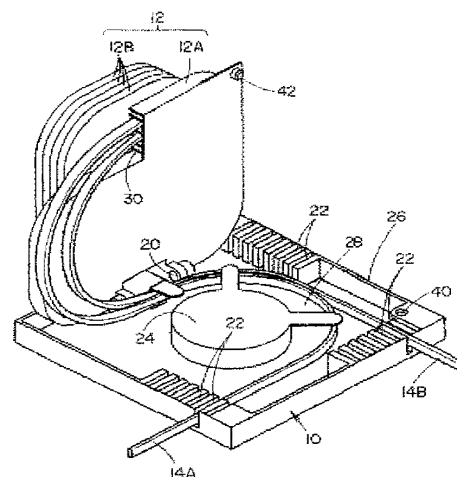
(54) 【発明の名称】 光ケーブル接続箱

(57) 【要約】

【課題】光ケーブル導入方向の自由度を高める。導入方向の変更を可能にする。光ケーブルの配列の変更を可能にする。接続箱外のケーブル必要長の変化に対応できるようにする。

【解決手段】 下側ケース１０と、この下側ケースにヒンジ結合されて積層された上側ケース１２とを備える。下側ケース１０には、周辺の複数箇所に異なる方向から光ケーブル１４Ａ、１４Ｂを導入できるように複数組のケーブル把持部２２を設け、導入された光ケーブルを外被を剥がずに同じ方向に周回させて収容するケーブル収容部２８を設ける。上側ケース１２は、下層トレイ１２Ａとこの下層トレイに積層された上層トレイ１２Ｂとで構成する。下層トレイ１２Ａに、下側ケース１０から上がってきた光ケーブルを引入れるケーブル引入れ部３０を設ける。上層トレイ１２Ｂに、下層トレイから上がってきた光ファイバ心線とその接続部を収容する心線収容部を設ける。

【选择题】图2



【特許請求の範囲】**【請求項1】**

下側ケース（10）と、この下側ケースにヒンジ結合されて積層された上側ケース（12）と、前記下側ケース（10）及び上側ケース（12）に被せられる防水カバー（54）とを備え、

前記下側ケース（10）は、当該ケースの周辺、外被内にテンションメンバーを有する光ケーブル（14A、14B）を導入する部分に設けられたケーブル把持部（22）と、導入された光ケーブルを外被を剥がずにそのまま周回させて収容するケーブル収容部（28）とを有しており、

前記上側ケース（12）は、当該ケースの周辺に設けられた、下側ケース（10）から上がってきた光ケーブルを引き入れるケーブル引入れ部（30）と、引き入れられた光ケーブルの外被を剥いで露出させた光ファイバ心線（16）とその接続部（18）を収容する心線収容部（38）とを有している、

ことを特徴とする光ケーブル接続箱。

【請求項2】

請求項1記載の光ケーブル接続箱であって、下側ケース（10）の周辺に、異なる方向から光ケーブルを導入できるようにケーブル把持部（22）が複数箇所に設けられていることを特徴とする光ケーブル接続箱。

【請求項3】

請求項1又は2記載の光ケーブル接続箱であって、

下側ケース（10）のケーブル収容部が、導入された光ケーブル（14A、14B）を全て同じ方向に周回させて収容するように形成されており、

上側ケース（12）が、下側ケース（10）にヒンジ結合されて積層された下層トレイ（12A）と、この下層トレイにヒンジ結合されて積層された上層トレイ（12B）とからなり、

前記下層トレイ（12A）に、下側ケース（10）から上がってきた光ケーブルを導入するケーブル引入れ部（30）と、引入れられた光ケーブルの外被を剥いで露出させた光ファイバ心線のうち互いに接続すべき一方の光ファイバ心線を他方の光ファイバ心線と周回方向が反対になるように案内する周回方向変換部（32）とが設けられ、

前記上層トレイ（12B）に、下層トレイ（12A）から上がってきた光ファイバ心線（16）とその接続部（18）を収容する心線収容部（38）が設けられている、

ことを特徴とする光ケーブル接続箱。

【発明の詳細な説明】**【技術分野】****【0001】**

本発明は、光ファイバ心線数の少ない光ケーブルの接続に用いられる光ケーブル接続箱に関するものである。

【背景技術】**【0002】**

屋外から建物の内部又は外壁に引き込まれた比較的光ファイバ心線数の少ない（例えば2心、4心、8心程度の）光ケーブルと、屋内に個別に配線される光ケーブルとの接続に用いられる光ケーブル接続箱は、設置スペース、配線スペースの制約などから、できるだけ小型で、光ケーブルの導入方向の自由度が大きく、導入方向の変更も可能なものであることが望ましい。また光ケーブル接続箱が建物の外壁に取り付けられる場合は、外壁を伝って流下する雨水の影響を受けにくくすることが望ましい。

【0003】

従来の光ケーブル接続箱は、周辺に接続すべき光ケーブルの導入部を設け、この導入部から導入した光ケーブルの外被を剥いで光ファイバ心線を露出させ、露出させた光ファイバ心線とその接続部を収容する心線収容部を設けたものが一般的である（特許文献1、2参照）。

【0004】

【特許文献1】特開平11-202147号公報

【特許文献2】特開平9-105822号公報

【発明の開示】

【発明が解決しようとする課題】

【0005】

しかし従来の光ケーブル接続箱は、箱内に導入した光ケーブルの、導入部から先の外被を剥ぎ取り、光ファイバ心線を裸の状態で収容する構造であるため、接続箱に少しでも雨水が入り込むと、光ファイバ心線が水と接触し、悪影響を受けやすい。またこの種の光ケーブル接続箱を完全な防水構造にすることはコスト高となり、実用的ではない。

【0006】

また従来の光ケーブル接続箱は、光ケーブルの導入方向が限られているため、光ケーブル接続箱の周囲のスペースが十分でない場合には、光ケーブルの導入が困難になることがある。また光ケーブル接続箱の周囲の状況が変化した場合に、光ケーブルの導入方向を変更することができない。また接続箱に導入した光ケーブルは、導入部から先の外被を剥いで光ファイバ心線を露出させてしまうため、光ケーブルの増設などの際に光ケーブルの配列などを変更することができず、不便である。さらに光ケーブル配線ルートの変更などにより接続箱外のケーブル必要長が変化した場合に、それに対応することができない。

【0007】

本発明の目的は、上記のような課題を解決した光ケーブル接続箱を提供することにある。

【課題を解決するための手段】

【0008】

本発明に係る光ケーブル接続箱は、下側ケースと、この下側ケースにヒンジ結合されて積層された上側ケースと、前記下側ケース及び上側ケースに被せられる防水カバーとを備え、

前記下側ケースは、当該ケースの周辺の、外被内にテンションメンバーを有する光ケーブルを導入する部分に設けられたケーブル把持部と、導入された光ケーブルを外被を剥がずにそのまま周回させて収容するケーブル収容部とを有しており、

前記上側ケースは、当該ケースの周辺に設けられた、下側ケースから上がってきた光ケーブルを引き入れるケーブル引入れ部と、引き入れられた光ケーブルの外被を剥いで露出させた光ファイバ心線とその接続部を収容する心線収容部とを有している、

ことを特徴とするものである（請求項1）。

【0009】

本発明に係る光ケーブル接続箱は、下側ケースの周辺に、異なる方向から光ケーブルを導入できるようにケーブル把持部が複数箇所に設けられていることが好ましい（請求項2）。

【0010】

また本発明に係る光ケーブル接続箱は、

下側ケースのケーブル収容部が、導入された光ケーブルを全て同じ方向に周回させて収容するように形成されており、

上側ケースが、下側ケースにヒンジ結合されて積層された下層トレイと、この下層トレイにヒンジ結合されて積層された上層トレイとからなり、

前記下層トレイに、下側ケースから上がってきた光ケーブルを導入するケーブル引入れ部と、引入れた光ケーブルの外被を剥いで露出させた光ファイバ心線のうち互いに接続すべき一方の光ファイバ心線を他方の光ファイバ心線と周回方向が反対になるように案内する周回方向変換部とが設けられ、

前記上層トレイに、下層トレイから上がってきた光ファイバ心線とその接続部を収容する心線収容部が設けられている、

ことが好ましい（請求項3）。

【発明の効果】

【0011】

請求項1の発明によれば、下側ケースに外被を剥がない光ケーブルを収容し、その光ケーブルを上側ケースに引き入れ、上側ケースに外被を剥いた光ファイバ心線を収容するようになっているため、下側ケースに水が入り込むことがあっても、上側ケースに収容されている光ファイバ心線が水と接触するおそれは少ない。このため簡単な防水カバーを被せる程度で建物の外壁などに設置することができる。

【0012】

また、光ケーブルを外被を剥がずに下側ケースに収容するようになっているので、光ケーブルを増設するとき等に、すでに導入されている光ケーブルをいったん外に出して、光ケーブルの配列を整理し直したり、導入方向を変更したりすることができる。

【0013】

また、光ケーブルを外被を剥がずに適当な長さ周回させて下側ケースに収容するようになっているので、光ケーブル配線ルートの変更などにより、接続箱外のケーブル必要長が変化したときなどは、下側ケースに収容されている光ケーブルを引き出したり、余分な光ケーブルを下側ケースに収容したりすることで、対応することが可能となる。

【0014】

また、下側ケースに光ケーブルを外被を剥がずに周回させて収容するようになっているので、ケーブル把持部を下側ケースの周辺の任意の位置に設けることができ、ケーブル導入方向の自由度が増す。

【0015】

また請求項2の発明によれば、下側ケースの周辺に、異なる方向から光ケーブルを導入できるようにケーブル把持部を複数箇所に設けたので、周囲の状況に応じて光ケーブルの導入方向を選択することができる。したがって、光ケーブル導入方向の自由度が高く、設置スペースの狭い所でも使用可能である。

【0016】

また請求項3の発明によれば、上側ケースを下層トレイと上層トレイに分け、下層トレイで光ケーブルの外被を剥いで光ファイバ心線を露出させると共に、接続すべき光ファイバ心線の周回方向が反対になるように周回方向を変換し、上層トレイに下層トレイから上がってきた光ファイバ心線とその接続部を収容するようにしたので、光ファイバ心線の本数が増えても、光ファイバ心線を整然と収容することができ、接続された光ファイバ心線の収容作業あるいはその後の保守点検作業を容易に行うことができる。

【発明を実施するための最良の形態】

【0017】

図1ないし図5は本発明の一実施形態を示す。この光ケーブル接続箱は、図1に示すように、下側ケース10と、その上に積層された上側ケース12とから構成されている。下側ケース10は接続すべき光ケーブル14A、14Bを外被を剥がずにそのまま収容するケースであり、上側ケース12は光ケーブル14A、14Bの外被を剥いで露出させた光ファイバ心線16と、その接続部18を収容するケースである。この実施形態では、上側ケース12は、1枚の下層トレイ12Aと、その上に積層された複数枚（図示の例では4枚）の上層トレイ12Bとから構成されている。

【0018】

下側ケース10と、上側ケース12側の下層トレイ12Aとは、図4に示すように、一辺でヒンジ部20により結合されており、これにより上側ケース12全体が、図1及び図2のように、下側ケース10上で開閉可能となっている。同様に、下層トレイ12Aと最下層の上層トレイ12Bも上記と同じ辺でヒンジ結合され、これにより複数枚の上層トレイ12B全体が、図1及び図3のように、下層トレイ12A上で開閉可能となっている。さらに最下層以外の上層トレイ12Bは、その下の上層トレイ12Bと上記と同じ辺でヒンジ結合され、個別に開閉可能となっている。

【0019】

下側ケース10は四角形で、図2に示すように、ヒンジ部20が設けられた辺を除く3辺に、下側ケース10に導入される光ケーブル14A、14Bを把持するケーブル把持溝22が形成されている。したがって下側ケース10には3方向のうちの任意の方向から互いに接続すべき光ケーブル14A、14Bを導入することが可能である。ケーブル把持溝22は、光ケーブル14A、14Bを押し込むだけで通常の外力では引き抜けなくなる程度の把持力を発生するように、溝幅、蛇行幅などが設定されている。なお、光ケーブル14A、14Bは、光ファイバ心線の両側にテンションメンバーを配置し、一括被覆を施したもので、外被の形状は扁平である。

【0020】

また下側ケース10の底板の中央部にはケーブルガイド突起24が形成されており、このガイド突起24と周壁26の間がケーブル収容部28となっている。ケーブル把持溝22から下側ケース10に導入された光ケーブル14A、14Bは、ガイド突起24のまわりに外被を剥がずに一方向に周回するように収容される。各辺のケーブル把持溝22は、導入された光ケーブルが全て同じ方向に周回できるように、その位置及び方向が設定されている。

【0021】

なおケーブル把持溝22は、使用前は、外端が薄壁で塞がれており、光ケーブル14A、14Bを導入するときは、この薄壁を切除して導入するようになっている。上記のような薄壁を設けておくと、下側ケース10内に塵埃や水が入りにくくなる。

【0022】

次に、上側ケース12の下層トレイ12Aは、図3及び図5に示すように、周辺の1箇所（ヒンジ部20を設けた辺と反対側の辺）に、下側ケース10から上がってきた光ケーブル14A、14Bを導入するケーブル引入れ部30が設けられている。ケーブル引入れ部30は多数の光ケーブル14A、14Bを整列させた状態で引入れられるように形成されている。またケーブル引入れ部30には弾性片などで光ケーブルを軽く把持する程度の把持力をもたせてある。

【0023】

下層トレイ12Aに引入れられた光ケーブル14A、14Bは、外被を剥いで光ファイバ心線16を露出させる。下層トレイ12Aには底板のほぼ中央部に二つの心線ガイド突起32が形成されている。この二つのガイド突起32は、外被を剥いで露出させた光ファイバ心線16のうち、互いに接続すべき一方の光ファイバ心線をS字状に案内して、他方の光ファイバ心線と周回方向が反対になるように（突き合わせ接続ができる状態に）するためのものである。

【0024】

なお図5の例は、下層トレイ12Aに、光ファイバ心線16の分割部34を収容したものである。例えば一方の光ケーブル14Aが4心のテープ心線16Aを有し、これと接続すべき他方の光ケーブル14Bが2心のテープ心線16Bを有するものである場合、4心のテープ心線16Aを分割部34で2心ずつに分割して、相手方の2心テープ心線16Bと接続できるようにしたものである。図5の例では4心のテープ心線16Aを8の字状に案内して、周回方向を変換している。

【0025】

下層トレイ12Aで周回方向を反対向きにされた互いに接続すべき光ファイバ心線16は、1心ずつ（又は扱いやすい複数少心ずつ）上層トレイ12Bに導入される。上層トレイ12Bは、図1に示すように、底板の中央部に心線ガイド突起36が設けられ、そのまわりが心線収容部38となっている。下層トレイ12Aから上層トレイ12Bに上がってきた光ファイバ心線16は適当な余長をもたせて相手方と接続され、その接続部18と心線余長は心線収容部38に収容される。

【0026】

なお、40は下側ケース10の上面に設けられた穴、42は下層トレイ12Aの下面に設けられた突起、44は下層トレイ12Aの上面に設けられたつまみである。下層トレイ

12Aはつまみ44をつまんで開閉される。下層トレイ12Aを閉じると突起42と穴40がややきつめに嵌合して、つまみ44を引張らない限り下層トレイ12Aが開かないようになる。

【0027】

以上のように構成された光ケーブル接続箱は、屋内に設置するとき、例えば配電盤の空きスペースなどに、そのまま設置することができる。また建物の外壁などに設置する場合は、図6のように設置すればよい。すなわち、上記のように構成された光ケーブル接続箱50を建物の外壁52に取り付け、着脱可能な防水カバー54を被せればよい。このようにすれば、光ケーブル接続箱50に直接雨水が当たることはなく、また外壁52を伝わって流下する雨水が接続箱50に入り込むことがあっても、接続箱50内は下側ケース10と上側ケース12の二重床構造になっているため、水をきろう光ファイバ心線が収容された上側ケースには水が入りにくく、光ファイバ心線が悪影響を受けるおそれは少ない。なお、この場合は、光ケーブル14A、14Bは下側ケース10の下辺に設けられたケーブル把持部から導入することになる。

【0028】

以上の実施形態では、上側ケースが1枚の下層トレイと複数枚の上層トレイとからなる場合を説明したが、光ケーブルの本数が少ない場合には、上側ケースを、下層トレイと同様な構造で心線接続部を収容可能な1枚又は複数枚のトレイで構成することもできる。

【0029】

また以上の実施形態では、下側ケースに導入された光ケーブルを全て同じ方向に周回させる場合を示したが、下側ケースは接続すべき光ケーブルを互いに反対方向に周回させて収容する構造にしてもよい。このようにすると、上側ケースで光ファイバ心線をS字状に案内して周回方向を変換する必要がなくなる。

【図面の簡単な説明】

【0030】

【図1】本発明に係る光ケーブル接続箱の一実施形態を示す斜視図。

【図2】図1の光ケーブル接続箱の、上側ケース全体を開いた状態を示す斜視図。

【図3】図1の光ケーブル接続箱の、上層トレイ全体を開いた状態を示す斜視図。

【図4】図1の光ケーブル接続箱の、下側ケースと上側ケースの結合状態を示す斜視図。

【図5】図1の光ケーブル接続箱の、下層トレイの一例を示す平面図。

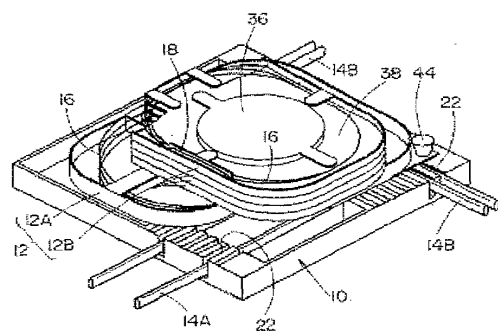
【図6】本発明に係る光ケーブル接続箱を建物の外壁に取り付けた状態を示す説明図。

【符号の説明】

【0031】

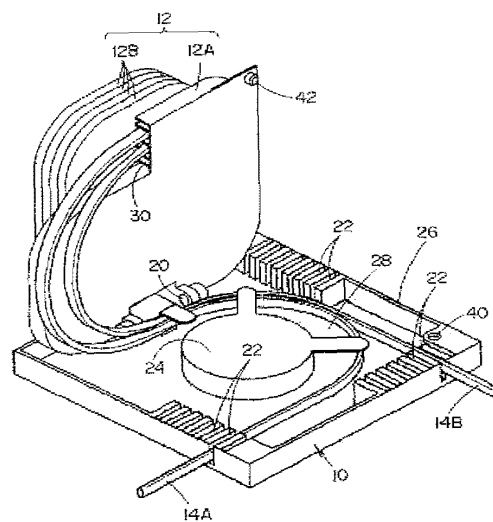
- 10：下側ケース
- 12：上側ケース
- 12A：下層トレイ
- 12B：上層トレイ
- 14A、14B：光ケーブル
- 16：光ファイバ心線
- 18：心線接続部
- 20：ヒンジ部
- 22：ケーブル把持溝
- 28：ケーブル収容部
- 30：ケーブル引入れ部
- 38：心線収容部

【図1】

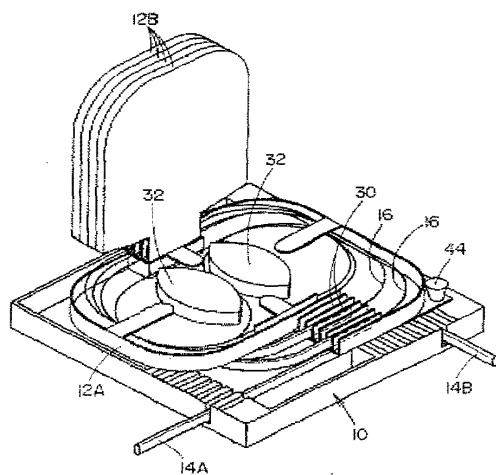


- | | |
|----------------|-------------|
| 10: 下側ケース | 18: 心線接続部 |
| 12: 上側ケース | 20: ヒンジ部 |
| 12A: 下層トレイ | 22: ケーブル把持部 |
| 12B: 上層トレイ | 28: ケーブル収容部 |
| 14A、14B: 光ケーブル | 30: ケーブル引入部 |
| 16: 光ファイバ心線 | 38: 心線収容部 |

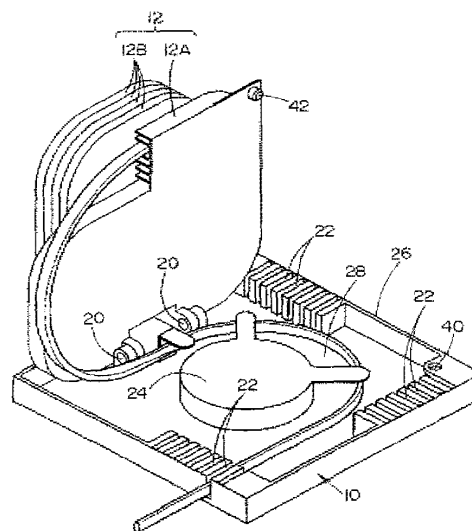
【図2】



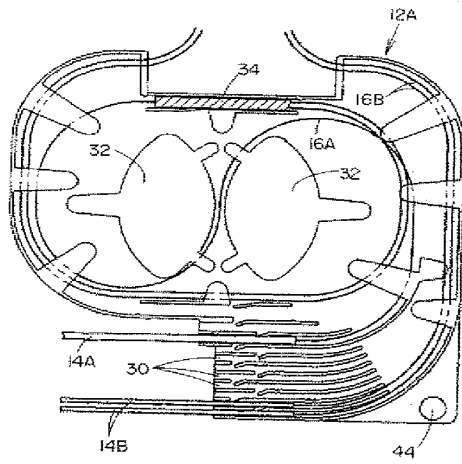
【図3】



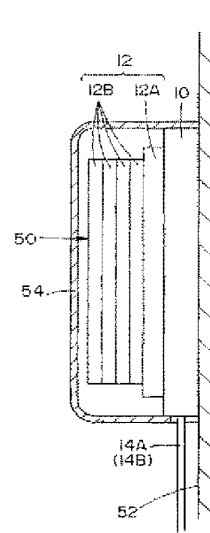
【図4】



【図5】



【図6】



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Patent Abstracts of Japan

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PUBLICATION DATE : 21-05-09

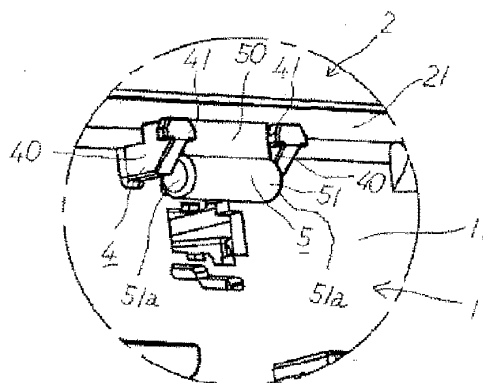
APPLICATION DATE : 30-10-07
APPLICATION NUMBER : 2007281621

APPLICANT : NITTO ELECTRIC WORKS LTD;

INVENTOR : ITO HIROO;

INT.CL. : G02B 6/00 (2006.01)

TITLE : STACKING TRAY FOR STORING
OPTICAL FIBER



ABSTRACT : PROBLEM TO BE SOLVED: To provide a stacking tray for storing optical fibers, erecting a tray body located on the upper side between the stacked tray bodies taking a hinge as a fulcrum, and holding the erected state.

SOLUTION: In this stacking tray, a plurality of optical fiber storing tray bodies 1, 2 are stacked and freely pivotally erected by the hinge 3. An elastic projection 4 is projected on the side surface 11 on the hinge 3 side of one tray body 1 between the upper and lower stacked tray bodies, and a locking projection 5 is projected on the side surface 21 of the hinge 3 side of the other tray body 2. In the erected state of the upper tray body 2, the locking projection 5 is engaged with the elastic projection 4 to hold the erected state.

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WPI / Thomson

AN - 2006-562752 [58]
AP - [Div Ex] JP20020073393 20020318; JP20060117485 20060421; [Previous
Publ JP2006195498 A 00000000]
CPY - NITE; SEID-N
DC - P81
- V07
DW - 200658; 200765
IN - NAKANO T; NAKAZAWA K; TAKEDA T
LNKA- 2006-451965; 2003-717339
MC - V07-F01A
PA - (NITE) NIPPON TELEGRAPH & TELEPHONE CORP
- (SEID-N) SEIDENSHA KK
PN - JP2006195498 A 20060727 DW200658
JP3983261B2 B2 20070926 DW200765
PR - JP20060117485 20060421; JP20020073393 20020318
XIC - G02B-006/00
AB - NOVELTY :
The box has an upper case (12) which is hingedly coupled to a lower
case (10) and both cases are enclosed by a waterproof cover. The lower
case has a groove (22) to insert the cables (14A,14B) under rotation
of a cable holder (28). The upper case has a drawer (30) to pull the
inserted cables such that striped wires (16) are stored in the
connector receptacle.
- USE :
For optical communication system installed in buildings.
- ADVANTAGE :
The cover is protected from the weather conditions and facilitates
installation on outer walls of the building. The degrees of freedom of
cable is increased as the insertion direction is selected in
accordance with the surroundings.
- DESCRIPTION OF DRAWINGS :
The figure shows a perspective view of optical cable connection base.
10 : lower case
12 : upper case
12A : lower tray
12B : upper tray
14A,14B : optical cables
20 : hinge
22 : groove
28 : cable holder
30 : cable drawer
ICAI- G02B6/00
ICCI- G02B6/00
INW - NAKANO T; NAKAZAWA K; TAKEDA T
IW - OPTICAL CABLE CONNECT BOX COMMUNICATE SYSTEM WATERPROOF COVER ENCLOSE
UPPER LOWER CASE EXPOSE WIRE RETAIN RECEPTACLE
IWW - OPTICAL CABLE CONNECT BOX COMMUNICATE SYSTEM WATERPROOF COVER ENCLOSE
UPPER LOWER CASE EXPOSE WIRE RETAIN RECEPTACLE
NC - 1
NPN - 2
OPD - 2002-03-18

PAW - (NITE) NIPPON TELEGRAPH & TELEPHONE CORP
- (SEID-N) SEIDENSHA KK
PD - 2006-07-27
TI - Optical cable connection box for optical communication system, has
waterproof cover to enclose upper and lower cases, and exposes wires
are retained within connector receptacle

XP-002678330

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AN - JP-2006117485-A

PN - JP2006195498 A20060727

PNFP - JP3983261B2 B2 20070926

TI - (A)

OPTICAL CABLE CONNECTION BOX

AB - (A)

PROBLEM TO BE SOLVED: To make a joint box adaptable to change in a required length of a cable outside the joint box by increasing the degree of freedom in the introducing direction of an optical cable and by enabling change of the introducing direction as well as change of the optical cable array.

- SOLUTION: A lower case10 is provided, as is an upper case12 that is connected to the lower case with a hinge and stacked thereon. In the lower case10, there are installed a plurality of cable holding units22 so that optical cables14A, 14B can be introduced from different directions to a plurality of peripheral places, and a cable storing part 28 so that the introduced optical cables can be wound in the same direction and stored without removing the jacket. The upper case12 is composed of a lower layer tray12A and an upper layer tray12B stacked thereon. In the lower layer tray 12A, a cable pull-in part30 is installed in which an optical cable coming up from the lower case10 is pulled in. In the upper layer tray12B, a coated fiber storing part is installed in which a coated optical fiber coming up from the lower layer tray and the connecting part thereof are housed.

- COPYRIGHT: (C)2006,JPO&NCIP

FI - G02B6/00&336

FT - 2H038/CA33; 2H038/CA34; 2H038/CA37; 2H038/CA38

PA - (A)

SHODENSHA CO LTD; NIPPON TELEGRAPH & TELEPHONE

IN - (A)

NAKANO TAKEYUKI; TAKEDA TOSHIKI; NAKAZAWA KENICHI

AP - JP20060117485 20060421

PR - JP20060117485 20060421

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日東工業株式会社内

Fターム (参考) 2H038 CA33 CA34 CA37 CA38

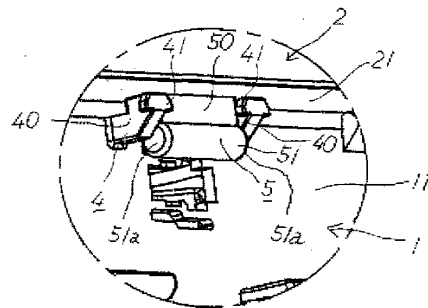
(54) 【発明の名称】 光ファイバ収納用の段積トレイ

(57) 【要約】

【課題】 段積したトレイ本体の上部位置するトレイ本体を蝶番を支点に起立させて、その起立状態を保持することのできる光ファイバ収納用の段積トレイを提供する。

【解決手段】 複数の光ファイバ収納用のトレイ本体1、2を段積して蝶番3により起伏自在とした段積トレイにおいて、上下に段積した一方のトレイ本体1の蝶番3側の側面11に弾性突起4を突設するとともに他方のトレイ本体2の蝶番3側の側面21に係止突起5を突設して、上方のトレイ本体2が起立した状態において弾性突起4に係止突起5に係合して、該起立した状態を保持したことを特徴とする光ファイバ収納用の段積トレイ。

【選択図】 図4



【特許請求の範囲】**【請求項1】**

複数の光ファイバ収納用のトレイ本体を段積して蝶番により起伏自在とした段積トレイにおいて、上下に段積した一方のトレイ本体の蝶番側の側面に弾性突起を突設するとともに他方のトレイ本体の蝶番側の側面に係止突起を突設して、上方のトレイ本体が起立した状態において弾性突起に係止突起に係合して、該起立した状態を保持したことを特徴とする光ファイバ収納用の段積トレイ。

【請求項2】

弾性突起を内向きに対向させた一对の爪部を備えるものとし、係止突起に前記一对の爪部の間に介入させる係合突出部を形成してトレイ本体が起立した状態において係合突出部の上面部が該爪部に係合する請求項1に記載の光ファイバ収納用の段積トレイ。

【請求項3】

弾性突起を外向きに形成した一对の爪部を備えるものとし、係止突起に前記一对の爪部の外側より係合する突出部を備えるものとして、トレイ本体が起立した状態において突出部の上面部が爪部に係合する請求項1に記載の光ファイバ収納用の段積トレイ。

【請求項4】

弾性突起の上部を平面部として形成し、トレイ本体が起立した状態において上部のトレイ本体の側面を前記平面部に当接して保持した請求項2又は3に記載の光ファイバ収納用の段積トレイ。

【発明の詳細な説明】**【技術分野】****【0001】**

本発明は、光ファイバの余長収納トレイ、心線接続トレイ、アダプタ接続トレイ等の光ファイバ収納用のトレイ本体を段積してなる光ファイバ収納用の段積トレイに関するものである。

【背景技術】**【0002】**

光ファイバ収納用の段積トレイは下方に位置するトレイ本体に光ファイバの配線作業を行う場合に、これの上部に位置するトレイ本体を除いて行う必要がある。そこで、これに対応させた技術手段としては、段積したトレイ本体を起伏自在に蝶番で連結して、上部に位置するトレイ本体を蝶番を支点に起立させて、下方に位置するトレイ本体の上面を開放状態とするものがある（特許文献1参照）。

【0003】

ところが、前記のような従来のは、上部に位置するトレイ本体を起立状態を保持するための手段を欠くものであるため、作業中にこのトレイ本体に手指が触れた際にトレイ本体が下方に位置するトレイ本体側に倒れるという問題がある。

【特許文献1】特開2005-157149公報（図2）

【発明の開示】**【発明が解決しようとする課題】****【0004】**

本発明は前記のような従来の問題点を解決して、段積したトレイ本体の上部位置するトレイ本体を蝶番を支点に起立させて、その起立状態を保持することのできる光ファイバ収納用の段積トレイを提供する。

【課題を解決するための手段】**【0005】**

本発明の光ファイバ収納用の段積トレイは、複数の光ファイバ収納用のトレイ本体を段積して蝶番により起伏自在とした段積トレイにおいて、上下に段積した一方のトレイ本体の蝶番側の側面に弾性突起を突設するとともに他方のトレイ本体の蝶番側の側面に係止突起を突設して、上方のトレイ本体が起立した状態において弾性突起に係止突起に係合して、該起立した状態を保持したことを特徴とするものを基本の発明とする。

【0006】

そして、この発明において、弾性突起を内向きに対向させた一対の爪部を備えるものとし、係止突起に前記一対の爪部の間に介入させる係合突出部を形成してトレイ本体が起立した状態において係合突出部の上面部が該爪部に係合するものが好ましいものである。

【0007】

また、弾性突起を外向きに形成した一対の爪部を備えるものとし、係止突起に前記一対の爪部の外側より係合する突出部を備えるものとして、トレイ本体が起立した状態において突出部の上面部が爪部に係合するものとしてもよい。

【0008】

さらに、弾性突起の上部を平面部として形成し、トレイ本体が起立した状態において上部のトレイ本体の側面を前記平面部に当接して保持したものとしてもよい。

【発明の効果】

【0009】

前記した本発明の光ファイバ収納用の段積トレイは、複数の光ファイバ収納用のトレイ本体を段積して蝶番により起伏自在としたものであるから、上部に位置するトレイ本体を蝶番を支点に回動して起立させて、下方に位置するトレイ本体の上面を開放状態として光ファイバの配線作業を行う事ができるものである。この場合に、上下に段積した一方のトレイ本体の側面に弾性突起を突設するとともに他方のトレイ本体の側面に係止突起を突設して、上方のトレイ本体が起立した状態において弾性突起に係止突起に係合して、該起立した状態を保持できるものであるから、作業中に起立させたトレイ本体に手指が触れても下方に位置するトレイ本体側に倒れることがないものである。

【0010】

また、弾性突起を内向きに対向させた一対の爪部を備えるものとし、係止突起を前記一対の爪部の間に介入させる係合突出部を形成してトレイ本体が起立した状態において係合突出部の上面部が爪部に係合したものとすれば、係合箇所が2箇所となり安定して上方のトレイ本体の起立状態を保持できるものである。

【0011】

また、弾性突起を外向きに形成した一対の爪部を備えるものとし、係止突起に前記一対の爪部の外側より係合する突出部を備えるものとして、トレイ本体が起立した状態において突出部の上面部が爪部に係合するものとしたものとしても、係合箇所が2箇所となり安定して上方のトレイ本体の起立状態を保持できるものである。

【0012】

さらに、前記弾性突起の上部を平面部として形成し、トレイ本体が起立した状態において上部のトレイ本体の側面を前記平面部に当接して保持したものとするれば、複数のトレイを起立させて弾性突起に強く荷重がかかった場合であっても安定してトレイを保持することができるものである。

【発明を実施するための最良の形態】

【0013】

次に、本発明の好ましい実施の形態を図に基づき説明する。

〔第1の実施形態〕

先ず、図1～図6に示す、内部に光ファイバの曲率を維持する複数の巻回部材を備える余長収納用のトレイ本体1の上に、図示を略した内部に心線接続部を保持する保持部材を備えるカバー2a付きの心線接続用のトレイ本体2を段積してなる光ファイバ収納用の段積トレイにより第1の実施形態を説明する。

【0014】

前記トレイ本体1の上に段積したトレイ本体2は蝶番3により回動して起伏自在とされている。なお、この蝶番3は一方のトレイ本体1に蝶番用軸部を設け、他方のトレイ本体1に前記蝶番用軸部に嵌合する蝶番用筒部を蝶番用軸部が嵌入できる切欠部を形成させて設けて、蝶番用軸部と蝶番用筒部を着脱できるものとしている。また、前記上下に段積した一方のトレイ本体である下方のトレイ本体1の蝶番3側の側面11に弾性突起4を突設

するとともに他方のトレイ本体である上方のトレイ本体2の蝶番3側の側面21に係止突起5を突設してある。

【0015】

そして、上方のトレイ本体2が蝶番3を支点に回動して下方のトレイ本体1の上面を開口させて起立した状態において弾性突起4に係止突起5に係合して、該起立した状態を保持するものである。これにより下方のトレイ本体1に光ファイバの配線作業において起立させたトレイ本体2に手指が触れても下方に位置するトレイ本体1側に倒れることがないものである。

【0016】

前記弾性突起4に係止突起5は図1—図4に示すものは、弾性突起4が下方のトレイ本体1の蝶番3側の側面11に突設し、一对の腕片部40、40の先端に内向きに対向させた一对の爪部41、41を備えるものとしている。また、係止突起5は上方のトレイ本体2の蝶番3側の側面21に突設した係合突出部としての腕板部50とその先端に前記一对の爪部41、41の間に介入させる係合突出部51よりなるものである。なお、係合突出部51の形状は図示のものは円柱形状であるが、四角形状、六角形状等その他形状でもよい。

【0017】

そして、トレイ本体2が蝶番3を支点に回動した際に係合突出部51の端部周縁部51a、51aが爪部41、41を外側に撓ませて該爪部41、41の間を通過した後に爪部41、41の撓みが解除されて図3、図4に示すように腕板部50の上面部50aに爪部41、41に係合するものとしている。これにより、トレイ本体2は下方に位置するトレイ本体1の内側に倒れることがない。

【0018】

また、弾性突起4の上部、すなわち一对の腕片部40、40の上部を平面部40a、40aとして形成し、トレイ本体2が起立した状態において腕片部40、40の上部の平面部40a、40aに、トレイ本体2の側面を当接させることにより、外側にも倒れることなく起立状態を保持するものである。

この構造により、複数のトレイを起立させた場合であって、弾性突起に荷重が強くなった場合であっても、安定してトレイを保持することができるという利点がある。

【0019】

なお、トレイ1本体が外側に倒れることを防止する構造としては、係止突起5の係合突出部51が下方に位置するトレイ本体1の側面11に当接させるものとしてもよい。

【0020】

さらに、トレイ本体2が起立した状態において腕片部40、40の上部の平面部40a、40aに、トレイ本体2の側面を当接させると同時に、係止突起5の係合突出部51が下方に位置するトレイ本体1の側面11に当接させる構造とすれば、弾性突起4及び係止突起5にかかる力が分散し、複数のトレイを起立させた場合であって、弾性突起に荷重が強くなった場合であっても、より安定してトレイを保持することができるという利点がある。

【0021】

また、爪部41是一对である必要はなく一方のみとしてもよい。すなわち、図5、図6に示すように、下方のトレイ本体1の蝶番3側の側面11に突設した弾性突起4を単一の腕片部40の先端に爪部41を備えるものとし、上方のトレイ本体2の蝶番3側の側面21に突設した係止突起5を前記爪部41に対応する腕板部50の上面部50aに形成したものとしてもよい。

さらに、上記構造において弾性突起4に係止突起5は、図5に示すように下方のトレイ本体1の側面11の蝶番3、3の中間に一組を配置してもよいが、蝶番3、3の外側にそれぞれ一組ずつ配置したものとしてもよい。

【0022】

さらに、弾性突起4及び係止突起5のうちいずれか一方を、蝶番3と一体的に形成して

もよい。例えば、蝶番用軸部を嵌入するトレイ本体2に設けた蝶番筒部の外周縁部に係止突起5を形成し、対応する弾性突起4を蝶番部の下方に対応して形成するものとしてもよい。

【0023】

なお、トレイ本体1とトレイ本体2とは種類の異なる光接続トレイであるが、上述したような蝶番、弾性突起、係止突起の構造をそれぞれのトレイに採用することにより、必要に応じて異なる種類のトレイを最適に段積みすることが可能なものである。

【0024】

〔第2の実施形態〕

次に、図7～図10に示す、内部に光ファイバの曲率を維持する複数の巻回部材を備える余長収納用のトレイ本体1同士を上下に段積みしてなる光ファイバ収納用の段積トレイにより第2の実施形態について説明する。

【0025】

この第2の実施形態2は前記第1の実施形態と、光ファイバ収納用の段積トレイの構成及び弾性突起4と係止突起5が相違するに過ぎないものであるから、この相違する部分につき説明し、他の説明は前記第1の実施形態の説明を援用する。

【0026】

すなわち、下方のトレイ本体1の蝶番3側の側面11に突設した弾性突起4は突出部としての一対の腕片部40、40の先端にそれぞれ外向きに爪部42、42を備えるものとし、上方のトレイ本体1の蝶番3側の側面11に突設した係止突起5を前記爪部42、42の外側より係合する一対の腕板部50、50よりなるものとしている。また、一対の腕板部50、50の下面には、断面半円状の突出部52、52が形成されている。

【0027】

これにより、トレイ本体1が蝶番3を支点に回動した際に一対の腕板部50、50の下面に設けた突出部52、52の端部周縁部52a、52aが爪部42、42を内側に撓ませて、該爪部42、42の外側を通過した後に爪部42、42が撓みを解除して腕板部50、50の上面が爪部42、42に係合している。これにより、トレイ本体1は下方に位置するトレイ本体1の内側に倒れることがない。

【0028】

また、実施形態1と同様に一対の腕片部40、40の上部を平面部40a、40aとして形成し、トレイ本体2が起立した状態において腕片部40、40の上部の平面部40a、40aに、トレイ本体2の側面を当接させる構造とすれば、外側にも倒れることなく起立状態を保持するものである。

また、トレイを起立させた状態で、係止突起5の係合突出部51が下方に位置するトレイ本体1の側面11に当接させるものとすれば、弾性突起に荷重が強かった場合であっても、安定してトレイを保持することができるという利点があることも実施形態1と同様である。

【0029】

また、図11に示すように、トレイ本体1の側面11にケーブル保持具6を取り付けるための取付孔7を設けて、該取付孔7にケーブル保持具6の裏面に設けた突起6aを着脱自在に嵌合できるものとするにより、ケーブルの出線位置に合わせて適切にケーブル保持具を配置できるものである。

【図面の簡単な説明】

【0030】

【図1】第1の実施形態を示す斜視図。

【図2】第1の実施形態の要部を示す斜視図

【図3】第1の実施形態を上方のトレイ本体を起立させて示す斜視図。

【図4】第1の実施形態を上方のトレイ本体を起立させて示す要部の斜視図。

【図5】第1の実施形態の他例の要部を示す斜視図

【図6】第1の実施形態の他例の上方のトレイ本体を起立させて示す要部の斜視図。

【図7】第2の実施形態を示す斜視図。

【図8】第2の実施形態の要部を示す斜視図

【図9】第2の実施形態を上方のトレイ本体を起立させて示す斜視図。

【図10】第2の実施形態を上方のトレイ本体を起立させて示す要部の斜視図。

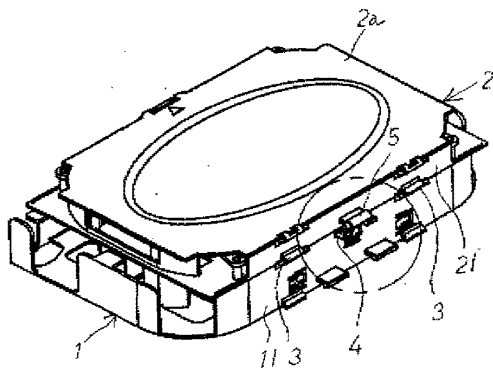
【図11】(A)は側面にケーブル保持具を取り付けたトレイ本体の1例を示す斜視図、(B)はケーブル保持具を示す斜視図である。

【符号の説明】

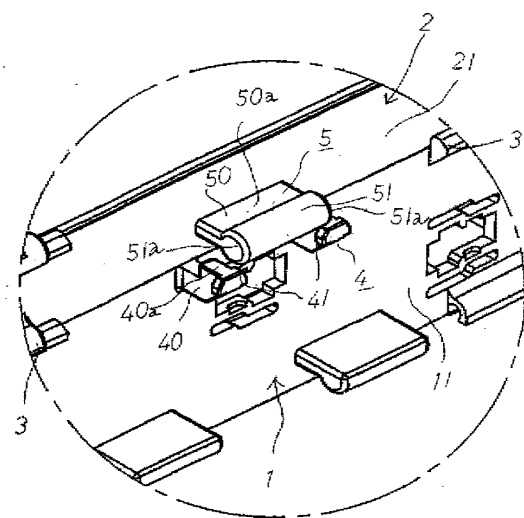
【0031】

- 1 トレイ本体
- 2 トレイ本体
- 3 螺番
- 4 弾性突起
- 41 爪部
- 42 爪部
- 5 係止突起
- 51 係合突出部
- 51a 端部周縁部
- 52 突出部
- 52a 周縁部

【図1】

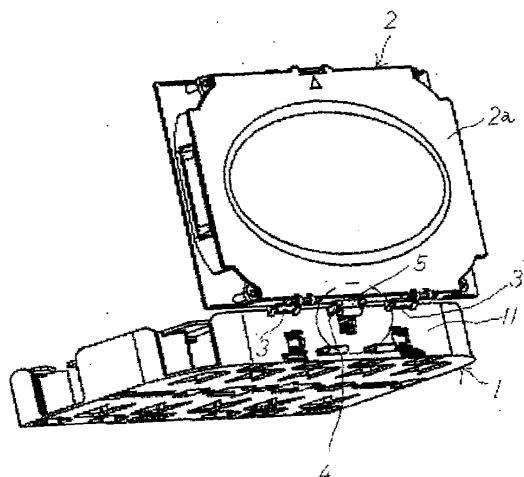


【図2】

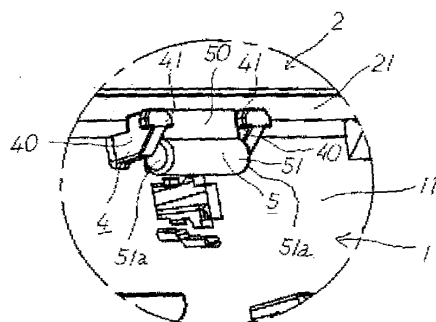


(7)

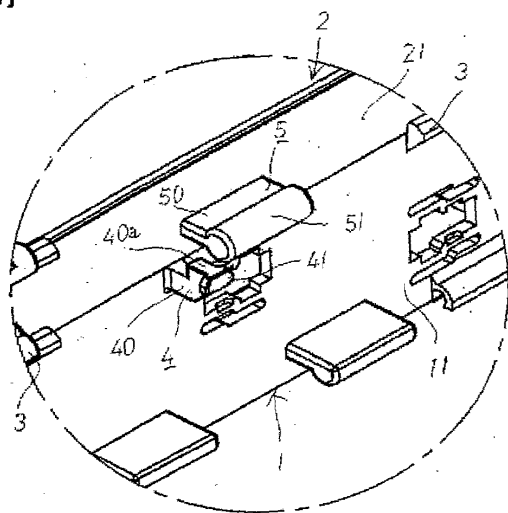
【図3】



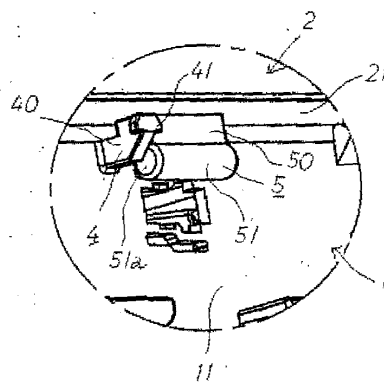
【図4】



【図5】



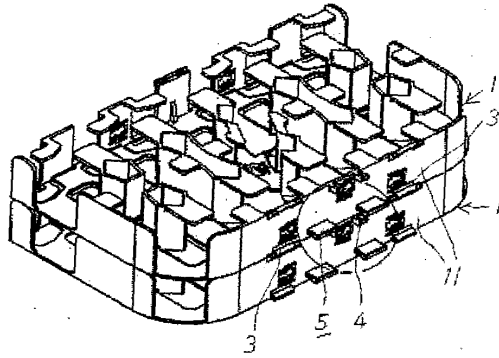
【図6】



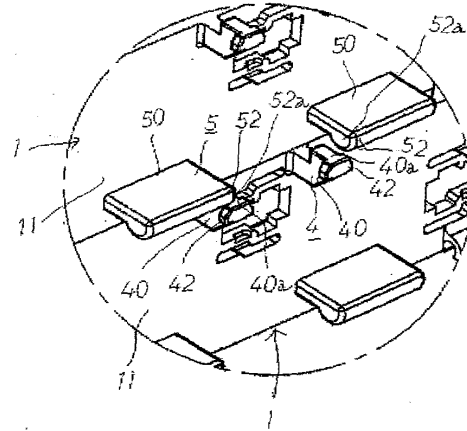
(8)

特開2009-109729 (P2009-109729A)

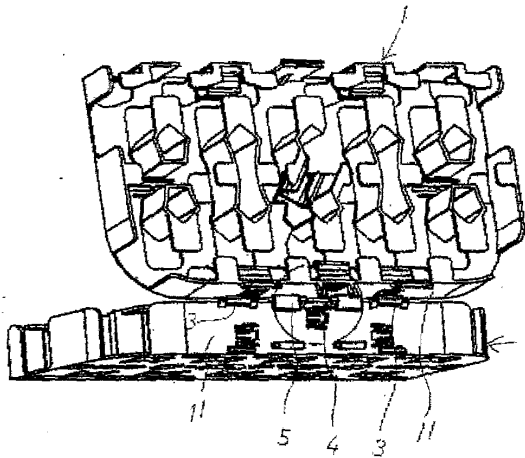
【図7】



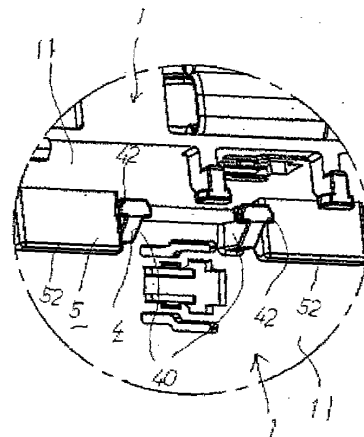
【図8】



【図9】



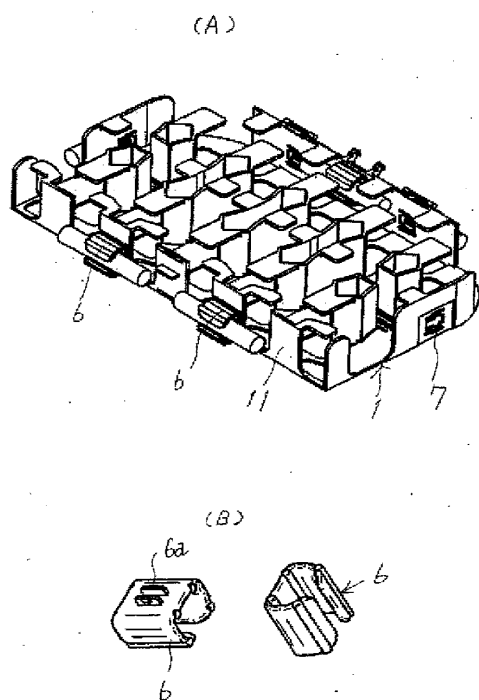
【図10】



(9)

特開2009-109729 (P2009-109729A)

【図11】



(1 0)

特開2009-109729 (P2009-109729A)

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT JUL 9 2012

To:
Veldhuis-Kroeze, John D.
WESTMAN, CHAMPLIN & KELLY, P.A.
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3319
ETATS-UNIS D'AMERIQUE

9/13/2012 AA.19
10/13/2012 Response WO

DOCKETED	9/13/2012
RESPONSE DUE	10/13/2012
CALENDARED	
CHECKED BY AITY	

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

(PCT Rule 44.1)

Date of mailing (day/month/year)	3 July 2012 (03-07-2012)
Applicant's or agent's file reference C64.13-0020/JVK	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US2012/032320	International filing date (day/month/year) 5 April 2012 (05-04-2012)
Applicant COMMUNICATION SYSTEMS, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004 - 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide, National Chapters*.

Name and mailing address of the International Searching Authority	Authorized officer
 European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	CORNUDET, Véronique Tel: +49 (0)30 25901-712

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference C64.13-0020/JVK	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2012/032320	International filing date (day/month/year) 05/04/2012	(Earliest) Priority Date (day/month/year) 05/04/2011
Applicant COMMUNICATION SYSTEMS, INC.		

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

This international search report consists of a total of 4 sheets.

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

1. Basis of the report

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

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

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

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

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

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

4. With regard to the **title**,

- ☐ the text is approved as submitted by the applicant
☒ the text has been established by this Authority to read as follows:

OPTICAL FIBER CABLE DROP INTERFACE BOX

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 39.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 5-4
☒ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
- b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/032320

A. CLASSIFICATION OF SUBJECT MATTER

INV. G02B6/44

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2009 109729 A (NITTO ELECTRIC WORKS LTD) 21 May 2009 (2009-05-21) abstract; figures 1-10 -----	1,11
X	US 2007/086721 A1 (DOBBINS PATRICK E [US] ET AL) 19 April 2007 (2007-04-19) paragraphs [0030], [0036], [0044], [0048]; figures 1-7 -----	1,2, 11-14
X	US 2003/103750 A1 (LAPORTE RICHARD B [US] ET AL) 5 June 2003 (2003-06-05) paragraph [0024]; figures 1-3,6 -----	1-4, 12-14
X	US 2009/202214 A1 (HOLMBERG MATTHEW [US] ET AL) 13 August 2009 (2009-08-13) paragraphs [0045], [0051] - [0053]; figures 6-11 ----- -/--	1,11



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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

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

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

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

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

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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

"&" document member of the same patent family

Date of the actual completion of the international search

21 June 2012

Date of mailing of the international search report

03/07/2012

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Fax: (+31-70) 340-3016

Authorized officer

Ciarrocca, Marco

1

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/032320

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Week 200658 Thomson Scientific, London, GB; AN 2006-562752 XP002678329, -& JP 2006 195498 A (NIPPON TELEGRAPH & TELEPHONE CORP) 27 July 2006 (2006-07-27) abstract; figures 1-6 -& DATABASE EPODOC [Online] EUROPEAN PATENT OFFICE, THE HAGUE, NL; 27 July 2006 (2006-07-27), "OPTICAL CABLE CONNECTION BOX", XP002678330, Database accession no. JP-2006117485-A -----	1
X	US 5 109 467 A (HOGAN JOSEPH R [US] ET AL) 28 April 1992 (1992-04-28) column 3, lines 2-27; figures 2-4 -----	1,3,12, 14
A	US 2004/062508 A1 (BLANKENSHIP AARON I [US] ET AL) 1 April 2004 (2004-04-01) abstract; figures 1-6 paragraph [0012] -----	1,3,11, 12,14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/032320

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2009109729 A	21-05-2009	JP 4883710 B2 JP 2009109729 A	22-02-2012 21-05-2009
US 2007086721 A1	19-04-2007	US 2007086721 A1 WO 2007011754 A2	19-04-2007 25-01-2007
US 2003103750 A1	05-06-2003	CA 2409594 A1 EP 1316829 A2 US 2003103750 A1	30-05-2003 04-06-2003 05-06-2003
US 2009202214 A1	13-08-2009	US 2009202214 A1 WO 2009076536 A1	13-08-2009 18-06-2009
JP 2006195498 A	27-07-2006	JP 3983261 B2 JP 2006195498 A	26-09-2007 27-07-2006
US 5109467 A	28-04-1992	NONE	
US 2004062508 A1	01-04-2004	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2012/032320

International filing date (day/month/year)
05.04.2012

Priority date (day/month/year)
05.04.2011

International Patent Classification (IPC) or both national classification and IPC
INV. G02B6/44

Applicant
COMMUNICATION SYSTEMS, INC.

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

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

2. **FURTHER ACTION**

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

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

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

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

Name and mailing address of the ISA:



European Patent Office
Gitschiner Str. 103
D-10958 Berlin
Tel. +49 30 25901 - 0
Fax: +49 30 25901 - 840

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Ciarrocca, Marco

Telephone No. +49 30 25901-0



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2012/032320

Box No. I Basis of the opinion

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

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

1. Statement

Novelty (N)	Yes: Claims	<u>5-10</u>
	No: Claims	<u>1-4, 11-14</u>
Inventive step (IS)	Yes: Claims	<u>5-10</u>
	No: Claims	<u>1-4, 11-14</u>
Industrial applicability (IA)	Yes: Claims	<u>1-14</u>
	No: Claims	

2. Citations and explanations

see separate sheet

1 Reference is made to the following documents:

- D1 JP 2009 109729 A (NITTO) 21 May 2009
- D2 US 2007/086721 A1 (DOBBINS ET AL) 19 April 2007
- D3 US 2003/103750 A1 (LAPORTE ET AL) 5 June 2003
- D4 US 2009/202214 A1 (HOLMBERG ET AL) 13 August 2009
- D5 JP 2006 195498 A (NTT) 27 July 2006
- D6 US 5 109 467 A (HOGAN ET AL) 28 April 1992
- D7 US 2004/062508 A1 (BLANKENSHIP ET AL) 1 April 2004

2 Claim 1 defines first and second spools such that the drop interface box comprises a plurality of first spools and a plurality of second spools. This implies that plural first coils can be wound around the plural first spools and that plural second coils can be wound around the plural second spools. However such an interpretation is not supported by the figures. According to the figures the spool structures 430 and 440 include each exactly two partial spools and each set of partial spools function together to allow a single coil to be wound around the set. It is therefore not clear (Art. 6 PCT) how to interpret the features "first spools" and "second spools".

This objection could be overcome by defining a first *set of* spools and a second *set of* spools in claim 1 as disclosed in [0026] of the description.

3 Notwithstanding the lack of clarity, it appears that the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

3.1 D1 discloses in fig. 7 in combination with fig. 1 a box (1+1+2+2a) suitable for use as a drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service (the openings in the sides appear to allow passage of cables which can be considered to be drop can distribution cables), the drop interface box comprising:
a base unit (bottom tray 1) having a drop cable entrance (for example the cut-out at the bottom corner) configured to receive the drop cable and having drop

cable retaining mechanisms (winding members, see [0024]) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover 2a (fig. 1) having a hinged 3 connection (indirect - see also [0017] of the present application) to the base unit (bottom tray 1 in fig. 7) to selectively enclose a storage area provided in the base unit; and

a fiber storage panel moveable (upper tray 1 in fig. 7) relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools (some of the winding members) positioned to store a plurality of feed break-out cables coupleable to the drop cable, the fiber storage panel further having second spools (other winding members) positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables.

Although D1 does not disclose the use of the box as a drop interface box with drop, feed break-out and distribution cables it appears suitable to use it as claimed, and the device claim 1 does not apparently include the cables in its scope.

Hence the subject-matter of claim 1 is not new.

- 3.2 A similar lack of novelty objection exists on account of D2 which discloses a cover 14 hinged 28 to a base 18, drop cable retaining mechanisms 116 (fig. 6 & [0044]) and first and second spools (fig. 7 & 8: sets of reels 120, 124 on plural trays 84) on moveable panels (trays 84).
- 3.3 A similar lack of novelty objection exists on account of D3 which discloses in the fig. 6 variant of fig. 1-3 a cover 50 hinged 52 to a base 20, drop cable retaining mechanisms 25 (fig. 2) and first and second spools (four spool elements are shown in fig. 6) on moveable panel 40. Although in D3 cable 12 is referred to as a drop cable and cable 16 as a distribution cable, it is possible to retain a drop cable using retaining mechanisms 25, and to store feed break-out cables as well as distribution cables in the spools.
- 4 Furthermore, the above-mentioned lack of clarity notwithstanding, and without prejudice to the previous novelty objections, it appears that the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT, and the criteria of Article 33(1) PCT are therefore not met.
- 4.1 D4 discloses with particular reference to [0052] and [0053] fig. 6 and 7 a wall box 200 suitable for use as a drop interface box configured to be mounted to a structure [0051] and to receive a drop cable ([0052], first sentence "cable") from an optical fiber service provider distribution point and a plurality of

distribution cables ([0053] "e.g., a distribution cable") which distribute the optical fiber service, the drop interface box comprising:

a base unit 216 having a drop cable entrance (fig. 8-11, 222) configured to receive the drop cable and having drop cable retaining mechanisms 264 spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms ([0052] "The stripped portion of the cable can then be spooled around the bend radius limiters 264");

a cover 220 having a hinged connection ([0038] "pivotal connection ... hinge pins 242") to the base unit 216 to selectively enclose a storage area provided in the base unit; and

a fiber storage panel 230 moveable relative to the base unit (from fig. 6, the panel is not permanently attached to the base unit 216) and configured to be stored between the base unit and the cover, the fiber storage panel having a first spool 298 positioned to store a plurality of feed break-out cables ([0053] "terminated fiber") coupleable to the drop cable, the fiber storage panel further having second spools 292 positioned to store a plurality of distribution cables ([0053] "e.g., a distribution cable") coupleable to the plurality of feed break-out cables.

According to D4, [0045] the first spool 298 comprises a single cylindrical spool 300.

The subject-matter of claim 1 thus differs in that first spools (i.e. a plurality of first spools) are provided.

It is standard to form a spool out of two halves which can each be considered to be partial spools. It appears obvious to implement this standard alternative in D4. Hence the subject-matter of claim 1 lacks an inventive step.

- 4.2 D5 discloses in the figures and the EPODOC and WPI abstracts, drop cable retaining mechanisms on spool 24 and next to hinge 20, first spools 32 and second spools 36 (each in a different tray 12B) on a moveable panel 12. In D5 the cover 54 (fig. 6) is apparently not hinged to the base unit. However since a hinged cover is a standard alternative (See e.g. D3 [0015] and D7 [0012]), it appears obvious to implement such a cover in D5. Hence the subject-matter of claim 1 lacks an inventive step.
- 4.3 D6 discloses in fig. 2-4 (see also col. 3, lines 10-27) first spools 28 and second spools 30 (i.e. two sets of spools, termed "radiuses" in D6) removeably secured to the base 14 and a hinged cover 21. As is visible in fig. 3 on the hinged side of the box two panels with a vertical line of holes are shown. In fig. 4 and 7 the right hand most line of holes appears to be used for

fixing a cable tie which holds the fibers in cable bundle 12. It thus appears that the panels with cable ties are suitable for holding a drop cable which can enter through opening 61 (fig. 3). The subject-matter of claim 1 thus apparently differs in that the spools are mounted on a moveable fiber storage panel. It appears obvious to mount the spools on a panel which can be removed to assist access, such as the panels in D1, D2, D3 ([0018]), D4 & D5. Hence the subject-matter of claim 1 lacks an inventive step.

- 5 Dependent claims 2-4, 11-14 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step in view of D1-D7. Reference is made to the passages cited in the International Search Report.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	<p>In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).</p> <p>If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).</p>
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPEA (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

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- | | |
|--|---|
| <p>(51) International Patent Classification:
<i>G02B 6/44</i> (2006.01)</p> <p>(21) International Application Number:
PCT/US2012/032320</p> <p>(22) International Filing Date:
5 April 2012 (05.04.2012)</p> <p>(25) Filing Language: English</p> <p>(26) Publication Language: English</p> <p>(30) Priority Data:
61/472,008 5 April 2011 (05.04.2011) US</p> <p>(71) Applicant (for all designated States except US): COMMUNICATION SYSTEMS, INC. [US/US]; 1001 East Highway 212, Hector, MN 55342 (US).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): LARSSON, Nicholas, B. [US/US]; 219 Schendel Street Po Box 152, Blomkest, MN 56216 (US). SWIENTON, Andrew, E. [US/US]; 4570 Ranier Court North, Plymouth, MN 55446 (US). WAKILEH, George, I. [US/US]; 440 Judd Lane, Batavia, IL 60510 (US).</p> | <p>(74) Agents: VELDHUIS-KROEZE, John, D. et al.; Westman, Champlin & Kelly, P.A., 900 Second Avenue South, Suite 1400, Minneapolis, MN 55402-3319 (US).</p> <p>(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.</p> <p>(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).</p> |
|--|---|

[Continued on next page]

(54) Title: OPTICAL FIBER CABLE DROP INTERFACE BOX

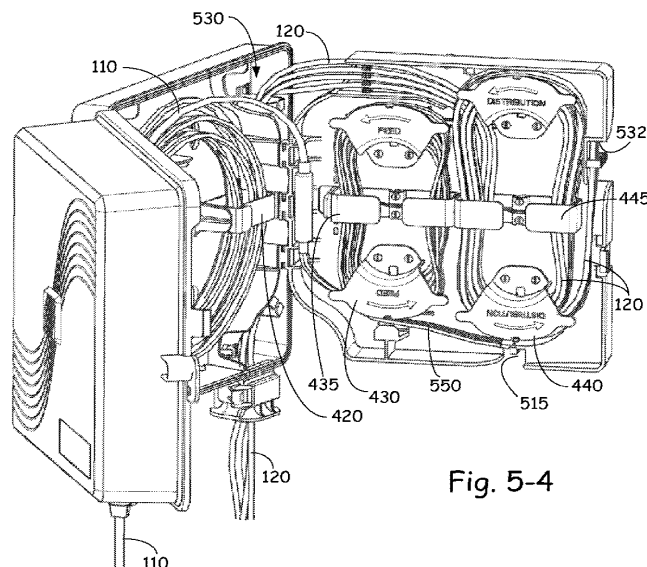


Fig. 5-4

(57) **Abstract:** Disclosed are exemplary embodiments of a drop interface box (DIB) (100) for interfacing between an optical network service provider's heavy jacketed drop cable (110) and optical distribution cables (120) at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel (405) includes spools (430; 440), cable clips (435; 445) and integrated cable channels (515; 532) that maintain cable radius during transitions of cables from a storage side or plane (415) of the panel to a connector side or plane (410) of the panel.



Published:

— *with international search report (Art. 21(3))*

-1-

OPTICAL FIBER CABLE DROP INTERFACE BOX

BACKGROUND

[0001] Disclosed embodiments relate to connection of an optical fiber feed or “drop” cable from an optical fiber service provider to a distribution point at a residence, dwelling or other building, such as a multi-unit dwelling. More particularly, disclosed embodiments relate to an enclosure for distribution of a passive optical fiber network. The enclosure will generally be mounted on a multi-dwelling residence, but can be mounted anywhere such distribution of a passive optical fiber network is desired to provide vertical, horizontal with one or multiple buildings in addition to providing building to building distribution using a variety of splice or termination options like ribbon splice or terminations.

[0002] Optical fiber is used in different delivery topologies to provide network access, for example internet access, to homes, businesses and other premises. Fiber to the x (FTTx) is a collective term for various optical fiber delivery topologies that are categorized according to where the fiber terminates. Optical fiber has commonly been used for long-distance parts of the network, but other communications media such as metal cabling has frequently been used in delivery to the customer premises. However, increasingly, optical fiber is being used to provide network access all of the way to the customer premises, and even within the customer premises.

[0003] Typically, a feed or drop optical fiber cable is provided to a premises, by an optical fiber service provider, from a larger distribution point or connection (e.g., a pole mounted distribution point). The feed is typically a heavy jacketed or hardened multi-fiber cable that is broken out at the premises into individual fiber connections. This is for example commonly the case at multi-dwelling residential buildings or at buildings that house multiple different businesses. Individual distribution fiber cables from inside each living or workplace unit are connected with adapters to the individual feed fiber optical cable connections from the multi-fiber drop cable.

[0004] Increasingly, optical fiber cables are pre-connectorized—that is they are shipped from a factory with terminating connectors already installed. This can lead to the need for installers to deal with excess optical fiber cable length in many instances. Other factors can also result in excess cable length. Storage of the excess cable length can be problematic, as can organization of the drop optical fiber cable, the multiple individual feed optical fiber cables, and the multiple individual distribution optical fiber cables which are connected to the

-2-

individual living or workplace units. The fact that the various optical fiber cables are pre-connectorized provides other challenges when attempting to store or organize the cables. Also, there is a need to protect the optical fiber cables from excessive strain, as well as from damage due to bending the cables at too small of a bend radius.

[0005] The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter.

SUMMARY

[0006] Disclosed are exemplary embodiments of a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel includes spools, cable clips and integrated cable channels that maintain cable radius during transitions of cables from a storage side or plane of the panel to a connector side or plane of the panel.

[0007] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a diagrammatic illustration of the use of a drop interface box (DIB) in accordance with disclosed embodiments.

[0009] Fig. 2-1 and 2-2 are perspective views of the DIB illustrated in Fig. 1.

[0010] Figs. 3-1 through 3-4 are illustrations of features of exemplary DIB embodiments which provide weather resistant seals, minimize strain on fiber cables, and prevent cable damage due to bending.

[0011] Figs. 4-1 and 4-2 are views of a base, cover and hinged fiber storage panel of a DIB in accordance with exemplary embodiments.

[0012] Figs. 5-1 through 5-3 are diagrammatic illustrations of drop, feed and distribution cable routing and storage in exemplary DIB embodiments.

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[0013] Fig. 5-4 is a view of an exemplary DIB showing drop, feed and distribution cable routed and stored as shown in Figs. 5-1 through 5-3.

[0014] Fig. 6-1 is a diagrammatic illustration of feed and distribution cable routing to a front side of the fiber storage panel in accordance with exemplary embodiments.

[0015] Figs. 6-2 and 6-3 are diagrammatic illustrations of distribution cable entrance features which provide weather resistant sealing and prevent cable damage due to bending.

[0016] Fig. 6-4 is a view of an exemplary DIB showing feed and distribution cable routing to the front side of the fiber storage panel in accordance with exemplary embodiments as shown in Fig. 6-1.

DETAILED DESCRIPTION

[0017] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.

[0018] Disclosed embodiments include a drop interface box (DIB) which provides an easy to use and reliable solution to FTTx deployments using factory terminated optical cable assemblies. The disclosed DIB includes integrated slack storage compartments which provide ample room to store excess cable length while maintaining separation of hardened drop, feeder breakout, and distribution cables. This unique slack storage design allows for drop and distribution cables to be added quickly and easily as demand increases. Use of the disclosed DIB is not limited to use with these pre-connectorized optical cables

[0019] Referring now to Fig. 1, shown is a diagrammatic illustration of the use of DIB 100 in accordance with exemplary embodiments. DIB 100 mounts at a desired location of a premises 130, which will typically be a multi-dwelling or multi-business type of premises in

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which multiple individual living spaces or units are included in a single larger building. However, DIB 100 is not limited to use in this type of premises. DIB 100 is configured to receive and partially house a hardened “drop” cable 110 from an optical fiber service provider distribution point 105, which can be, for example, a pole mounted box connected to the provider’s network. Inside of DIB 100, drop cable 110 is split into feeder breakout cables 550 (shown in Fig. 5-4) and converted into multiple distribution cables 120 which are connected in or to the individual units or locations 125 of premises 130. DIB 100 has numerous features, described below in detail, which aid in the organization and storage of the various cables, including pre-connectorized cables.

[0020] Referring now to Figs. 2-1 and 2-2, shown are side and front perspective views of DIB 100 in accordance with an exemplary embodiment. As shown in these Figs., DIB 100 includes a base unit 205 and a door or cover 210 which has a hinged connection to the base unit. A push to close cover latch 215 secures cover 210 to base unit 205 in a closed position, and a security screw housing 220 is formed with or in cover 210 and is configured to receive a security screw 222 for denying entry into DIB 100 to persons without a proper tool. For instance, in an exemplary embodiment, security screw 222 is a 3/8 inch security screw which is configured to be used with a “216 tool” of the type which is well known in the art. For further security, a padlock hasp 225 is also included in an exemplary embodiment for receiving a padlock (not shown) to lock cover 210 to base unit 205 in a closed position. In one exemplary embodiment, padlock hasp 225 can be integrally formed with the material of cover 210 and base unit 205. For example, in an exemplary embodiment cover 210, base unit 205 and the above-described components (not including security screw 222) are formed of a plastic material. In other embodiments, hasp 225 and/or other components are formed of other materials (e.g., metals) which are attached to cover 210 and/or base unit 205.

[0021] DIB 100 includes features which enable the entry of pre-connectorized cables (e.g., cables 110 and/or 120) into the DIB by an installer. A drop cable entrance 206 is configured to receive a drop cable from an optical service provider. Many conventional enclosures require cable to be fed through slots or apertures of a size which cannot accommodate pre-connectorized cables, but DIB 100 utilizes unique features to accommodate pre-connectorized cables. Yet other features of DIB 100 help to prevent damage to cables due to strain or bending. Both features that facilitate the use of pre-connectorized cables, and features that prevent strain or bending damage to the cables, are illustrated in detail in Figs. 3-1 through 3-4.

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[0022] Shown in Fig. 3-1 is a bend limiting cable boot 305 which is formed in a flexible molded clam-shell design to allow the boot to be installed over the pre-connectorized drop cable 110 without having to feed the cable through the boot. The boot 305 has a central channel 309 in which cable 110 is positioned when the two portions of the boot are closed together. Slots 307 are formed in the boot 305 so that the boot is secured to the cable 110 and to a cable clamp bracket (shown in Fig. 3-2) using standard cable ties 311, commonly available to installers. The flexible material, for example rubber, and tapered shape of boot 305 supports the cable 110, preventing a sharp bend in the cable at the edge of the strain-relief clamp 320 (shown in Fig. 3-2) when the cable 110 is pulled in any direction.

[0023] Referring now more particularly to Figs. 3-2 and 3-3, shown are components of a strain-relief cable clamp 320 which comprises a mounting bracket 325 and rigid clamp block 330 that engages the cable jacket of cable 110 in order to retain the cable position when axial force is applied to the cable. One or more threaded fasteners 331 provide a mechanical advantage while engaging the clamp block 330 and cable jacket. The position of the threaded fastener 331 and the shape of the clamp block 330 provide limited access to the general public while allowing the installer to use a “216 wrench”, commonly available to telcom installers. In exemplary embodiments, during factory assembly of the clamp components, the treaded fastener 331 is deformed to prevent clamp components from being separated during field operation. This prevents dropping or losing the components during operation. As is seen in the illustration of Fig. 3-3 which shows clamp block 330 isolated and from a bottom perspective view, the rigid clamp block has ribs/ridges 332 in the cable channels 334 to help keep the cable from slipping when clamped onto the drop cable 110.

[0024] Referring now to Fig. 3-4, shown is a weather proof or weather resistant cable entrance clip feature of DIB 100 in accordance with an exemplary embodiment. In the illustrated exemplary embodiment, cable clips 340 are of a rigid clam shell design to clip over the cable 110 without feeding the cable through. The clips 340 slide into flanges or slots 345 inside of the base 205 in an area adjacent to relief cable clamp, which is outside of base 205, to create a substantially weather tight seal between the clips 340 and base 205 of DIB 100. Closed cell foam gaskets 350 create a weather tight seal between the clips and cable jacket.

[0025] Referring next to Figs. 4-1 and 4-2, shown are the multiple storage compartments or features. As shown, base unit 205 has a hinged connection 401 to cover 210. A fiber storage panel 405 also has a hinged connection 406 to an opposing side of base unit 205. The hinged fiber storage panel 405 has a first or front side 410 (shown in Fig. 4-2) and a second

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or rear side 415 (shown in Fig. 4-1), both having unique features which aid in providing storage and organization of the various cables described above.

[0026] Base unit 205 includes drop cable storage clips 420. The drop feed cable 110, which enters DIB 100 above the position of strain-relief cable clamp 320 as described above, is fed around the storage clips 420 and stored in the base unit 205 of the DIB. On the rear side 415 of the hinged fiber storage panel 405, there are two sets of spools 430 and 440 and two sets of corresponding storage clips 435 and 445. Spools 430 and storage clips 435 store feed cables 550 (shown in Fig. 5-4). Spools 440 and clips 445 store distribution cables 120. A break-out or furcation plug 450 positioned near the upper end of hinged connection 406 divides the drop feed cable 110 into multiple (e.g., typically four) individual feed cables 550.

[0027] On the front side 410 of hinged fiber storage panel 405 is an adapter bracket 460 which holds one or more connectors or adapters 465, such as four-to-eight port adapters. Adapters 465 convert between the feed cables 550 and the distribution cables 120. The connectors or adapters 465 are standard components used in the telecommunications industry for converting optical fiber signals between feed cables and distribution cables. However, positioning adapters 465 on the front side of hinged panel 405, and in an exemplary embodiment at a center location on the front side of the hinged panel opposite the storage spools and clips positioned on the rear side of the panel, allows for routing of both of the feed cables and the distribution cables while maintaining proper bend radius. Hinged storage panel 405 and DIB include further features, which are described below with reference to Figs. 5-1 through 5-4 and 6-1 through 6-4, that aid in routing and storage of these cables while maintaining a proper bend radius.

[0028] Referring now to Fig. 5-1, shown are mechanisms for, and a method of, storing the feeder cable with outdoor jacket, namely drop cable 110. The above-mentioned cable storage clips 420 are situated in the base 205 to retain coils of the outdoor jacketed feeder cable without unnecessary stress on the cable or violating minimum bend radius. Using storage clips 420, the cable 110 is coiled in the direction as shown at arrows 505 in accordance with the preferential bend axis or radius for the particular cable type.

[0029] Referring now to Fig. 5-2, shown is arrow 510 representing the routing of cable 110 from base 205 to the rear side 415 of hinged fiber storage panel 405. As discussed above, panel 405 is hinged to provide convenient access to both sides of the panel. The pairs of cable storage spools 430 and 440 and corresponding cable storage clips 435 and 445, as well as routing channels 515 and 532 through which cables transition between the front and rear of

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panel 405, are positioned and designed to (1) maintain separation of cable storage between the feed cables (stored on spools 430 and clips 435) and the distribution cables 120 (stored on spools 440 and clips 445); (2) support the manufacturer's specified minimum bend radius for the cables; and (3) allow cables to be added after the initial installation without cross-over of cable types. The feeder cable breakout adapter storage area is located on the panel 405 nearest the hinge axis 406 and aligned with the hinge axis to allow easy transition of the drop cable 110 from the storage in the base 205 to the panel 405. The proximity and alignment to the hinge also allows the panel to be operated (open and closed) without excessive stress to the cable transition. The feeder breakout cable storage clips 435 are located in parallel to the breakout adapter storage 450 (see Fig. 4-1) to provide a convenient transition and to maintain minimum bend radius. The feeder break-out cables 550 are routed and stored on spools 430 and clips 435 as represented by arrows 512 shown in Fig. 5-3. As described above the fiber storage panel 405 also incorporates an integrated cable channel 515 that maintains cable radius while transitioning the feeder cables from the storage clips 435 on the back 415 of the panel to the connectors 465 on the front 410 of the panel. Arrow 516 represents the transition of cables 550 into channel 515.

[0030] Referring now more particularly to Fig. 5-3, shown is an integrated cable channel 530 in base 205. Integrated cable channel 530 is positioned parallel to the panel hinge 406 and located to the side edge of base 205 to allow the distribution cable 120 to be routed from the distribution cable entrance 535 to the top of the base and onto the panel 405 through opening 540 without cross-over of the other cable types. Arrow 531 represents the routing of distribution cables 120 from channel 530 onto panel 405. The location of the cable clips 445 and cable channel 532 on the back side 415 of the panel allows the distribution cable 120 to transition from the backside 415 of panel 405 to the front side 410 of panel 405 without causing unnecessary stress or bending during panel movement or operation. The distribution cable storage clips 445 are oriented to provide a convenient transition and to maintain minimum bend radius. Arrows 514 represent the routing and storage of distribution cables 120 on spools 440 and clips 445. The integrated channel 532 on fiber storage panel 405 transitions the distribution cables 120 from the storage clips 445 on the rear side 415 to the adapters or connectors on the front 410 of the pane while maintaining an acceptable cable radius. Arrow 518 represents the transition into channel 532.

[0031] Referring now to Fig. 5-4, DIB 100 is shown with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above.

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[0032] Referring now to Fig. 6-1, shown is panel 405 folded into base unit 205 for storage such that front side 410 of the panel is shown. The adapters or termination connectors 465 discussed above are shown on the front 410 of the panel oriented with respect to the cable channels 515 and 532 to maintain the necessary minimum bend radius during cable installation. Arrows 610 represent the routing of feed cables 550 on the front of panel 405, while arrows 620 represent the routing of distribution cables 120 on the same side. Channels 515 and 532 provide the transitions for these respective cables between the front and rear sides of the panel. Cable routing clips 612 attached to, or formed integrally with, panel 405 are also used to secure cables 120 and 550 to front side 410 of the panel in proper positions to maintain the acceptable bend radius specified by the cable manufacturer.

[0033] Referring now to Fig. 6-2, shown is the pre-connectorized distribution cable entry point 535 for distribution cable 120 in both open (right) and closed (left) positions. This entry point 535 includes an integrated cable grommet cavity 650 with bend limiting flange 645. An integrated portion of the enclosure base 205 provides the flange 645 and forms a cavity 650 to retain and compress the cable grommet 660 to provide a seal between the grommet, base 205, and cables 120. An integrated hinge 665 and latching system 670 are also provided for the cable entry cover portion 675. The integrated radius flange 645 limits the cable bend when pulled in any direction.

[0034] In an exemplary embodiment, the hinged cable entry cover 675 also includes a bend limiting flange 677. The cover 675 is in some embodiments a rigid cover that hinges on the grommet cavity 650. Opening the cover allows the grommet 660 to be removed, and when closed the cover 675 retains and compresses the grommet to provide a seal between the cover, grommet, base, and cables.

[0035] An example embodiment of a weather resistant pre-connectorized cable grommet 660 is shown in Fig. 6-3. Grommet 660 is, in exemplary embodiments, made of a flexible material such as rubber that will compress and seal against the base, cover and cables. The grommet employs cable ports comprising of thin slices though the material from the perimeter of the grommet towards the center. Near the center, the thin slices form a partial circle. These partial circle slugs can be peeled out to create a cavity for the cable. The radial slices protruding to the perimeter of the grommet can be spread open and a cable inserted without having to thread the cable end through the grommet.

[0036] Referring now to Fig. 6-4, DIB 100 is shown in its folded position (with front 410 of panel 405 shown facing out as the panel is stored in the base) with drop cable 110, feed

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cables 550 and distribution cables 120 routed and stored as described above, including the transition channels 515 and 532 as well as the cable adapters or connectors 465 positioned approximately at the center of panel 405.

[0037] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims. For example, in various embodiments, the DIB can be made from materials other than plastic. Further, the various components can be arranged in different ways than those specifically illustrated. Other examples of modifications of the disclosed concepts are also possible, without departing from the scope of the disclosed concepts.

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WHAT IS CLAIMED IS:

1. A drop interface box (100) configured to be mounted to a structure and to receive a drop cable (110) from an optical fiber service provider distribution point and a plurality of distribution cables (120) which distribute the optical fiber service, the drop interface box comprising:

a base unit (205) having a drop cable entrance (206) configured to receive the drop cable (110) and having drop cable retaining mechanisms (420) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover (210) having a hinged connection (401) to the base unit to selectively enclose a storage area provided in the base unit; and

a fiber storage panel (405) moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools (430) positioned to store a plurality of feed break-out cables (550) coupleable to the drop cable, the fiber storage panel further having second spools (440) positioned to store a plurality of distribution cables (120) coupleable to the plurality of feed break-out cables.

2. The drop interface box of claim 1, wherein the fiber storage panel includes a hinged connection (406) to the base unit on a side opposite the hinged connection of the cover to the base unit.

3. The drop interface box of claim 1, wherein the fiber storage panel further includes an adapter bracket (460) configured to hold one or more adapters (465) which couple the plurality of feed break-out cables to the plurality of distribution cables.

4. The drop interface box of claim 3, wherein the adapter bracket is positioned on a first side (410) of the fiber storage panel, and the first spools and second spools are positioned on a second side (415) of the fiber storage panel.

5. The drop interface box of claim 4, and wherein the fiber storage panel further includes a first set of cable storage clips (435) positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips (445) positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

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6. The drop interface box of claim 4, wherein the fiber storage panel further comprises a first routing channel (515) and a second routing channel (532), the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

7. The drop interface box of claim 6, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

8. The drop interface box of claim 6, wherein the base unit further comprises a cable channel (530) formed substantially parallel to the hinged connection of the fiber storage panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance (535) at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

9. The drop interface box of claim 8, wherein the distribution cable entrance includes a cable grommet cavity (650) and a bend limiting flange (645).

10. The drop interface box of claim 9, and further comprising a cable grommet (660) retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

11. The drop interface box of claim 1, wherein the drop cable retaining mechanisms (420) in the base unit comprise storage clips positioned on opposing sides of the base unit.

12. The drop interface box of claim 1, wherein the drop cable entrance further comprises slots (345) formed in the base unit and configured to receive a cable clip (340) which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit.

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13. The drop interface box of claim 12, and further comprising a strain-relief clamp (320) coupled to the base unit proximate the drop cable entrance.

14. The drop interface box of claim 1, and further comprising a security mechanism (220 or 225) for securing the cover to the base unit in a closed position.

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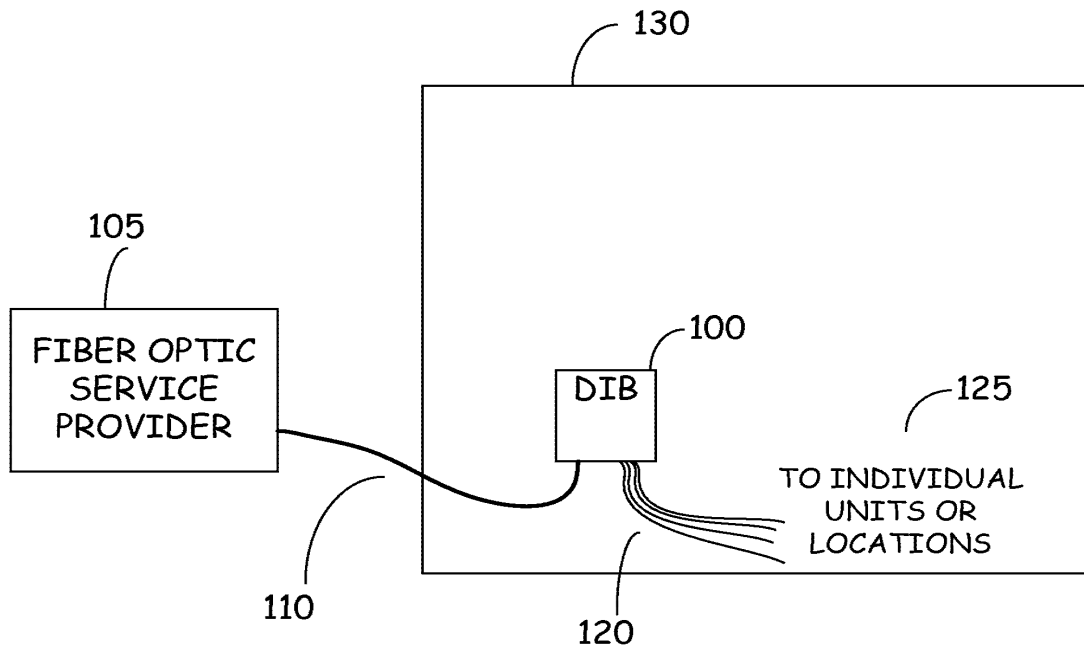


Fig. 1

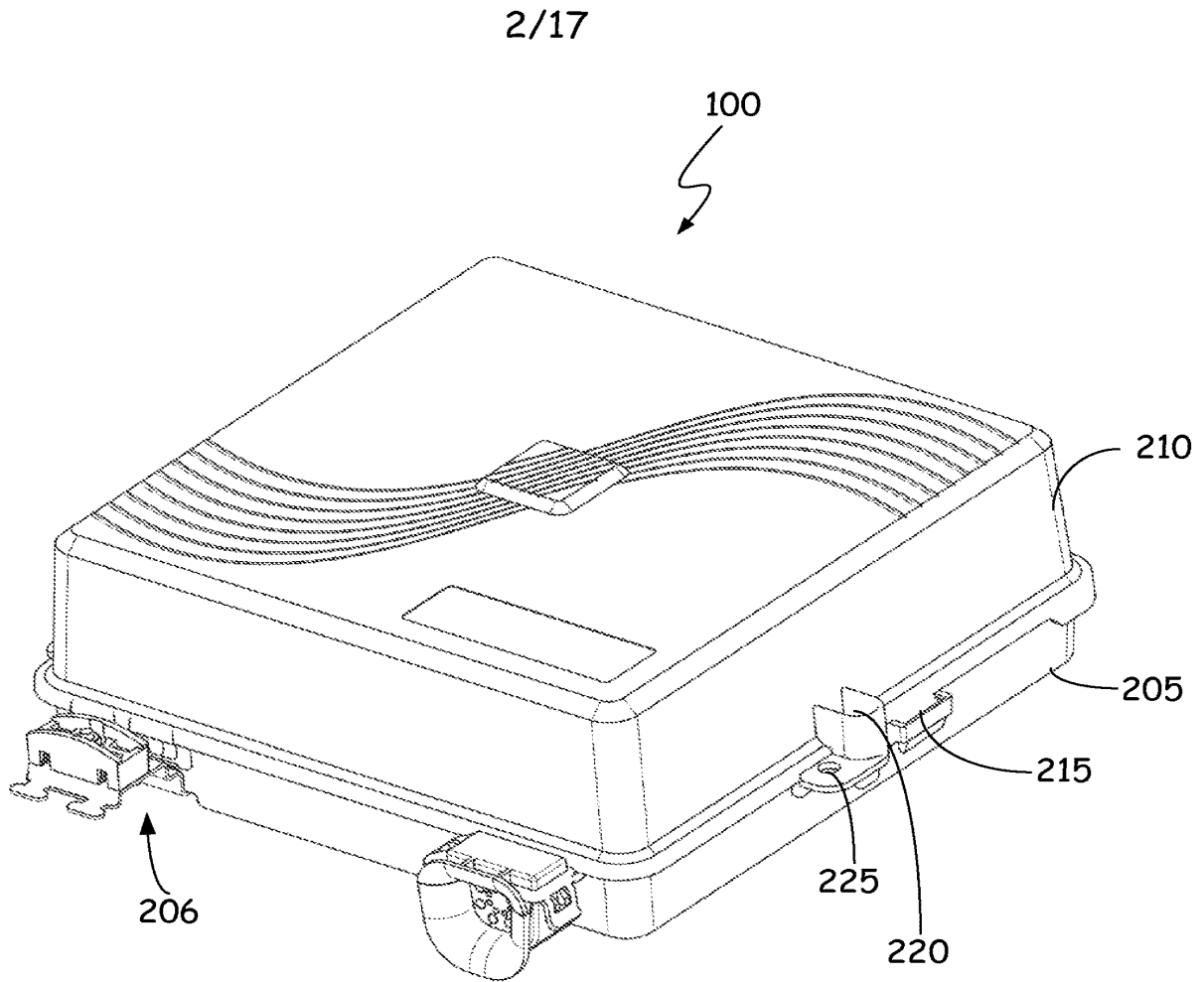


Fig. 2-1

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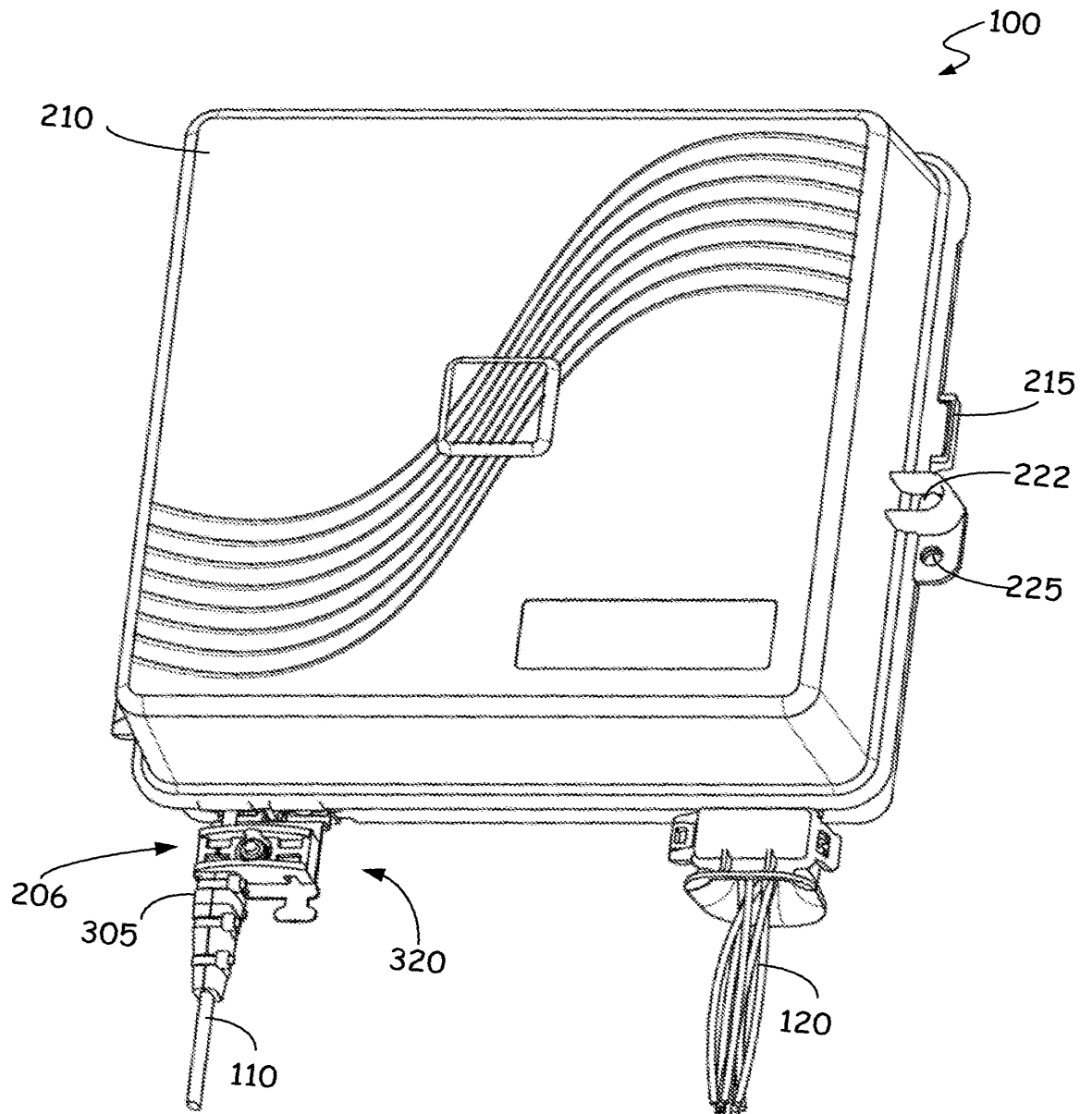


Fig. 2-2

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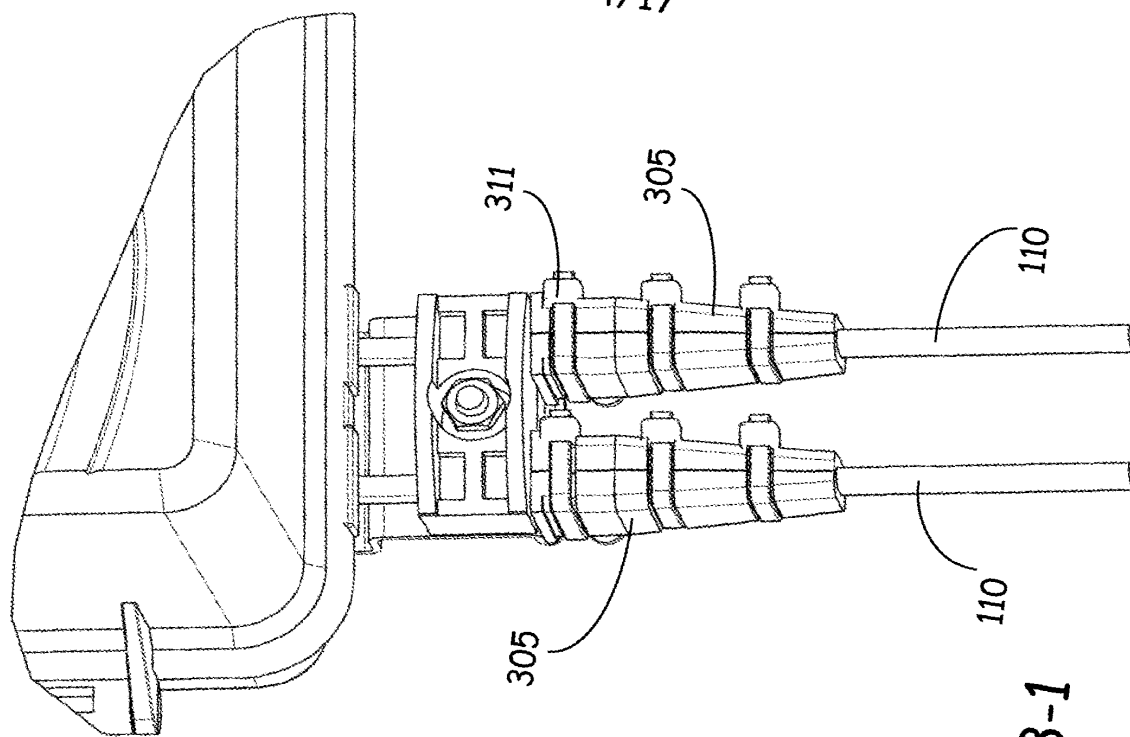
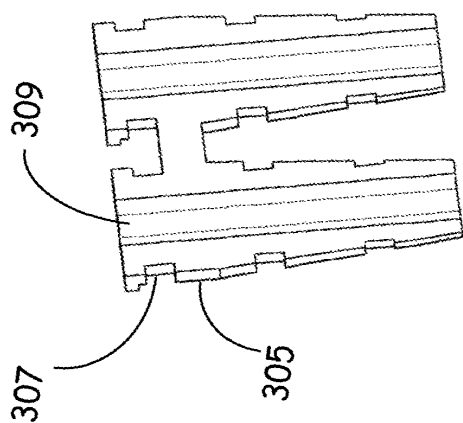


Fig. 3-1



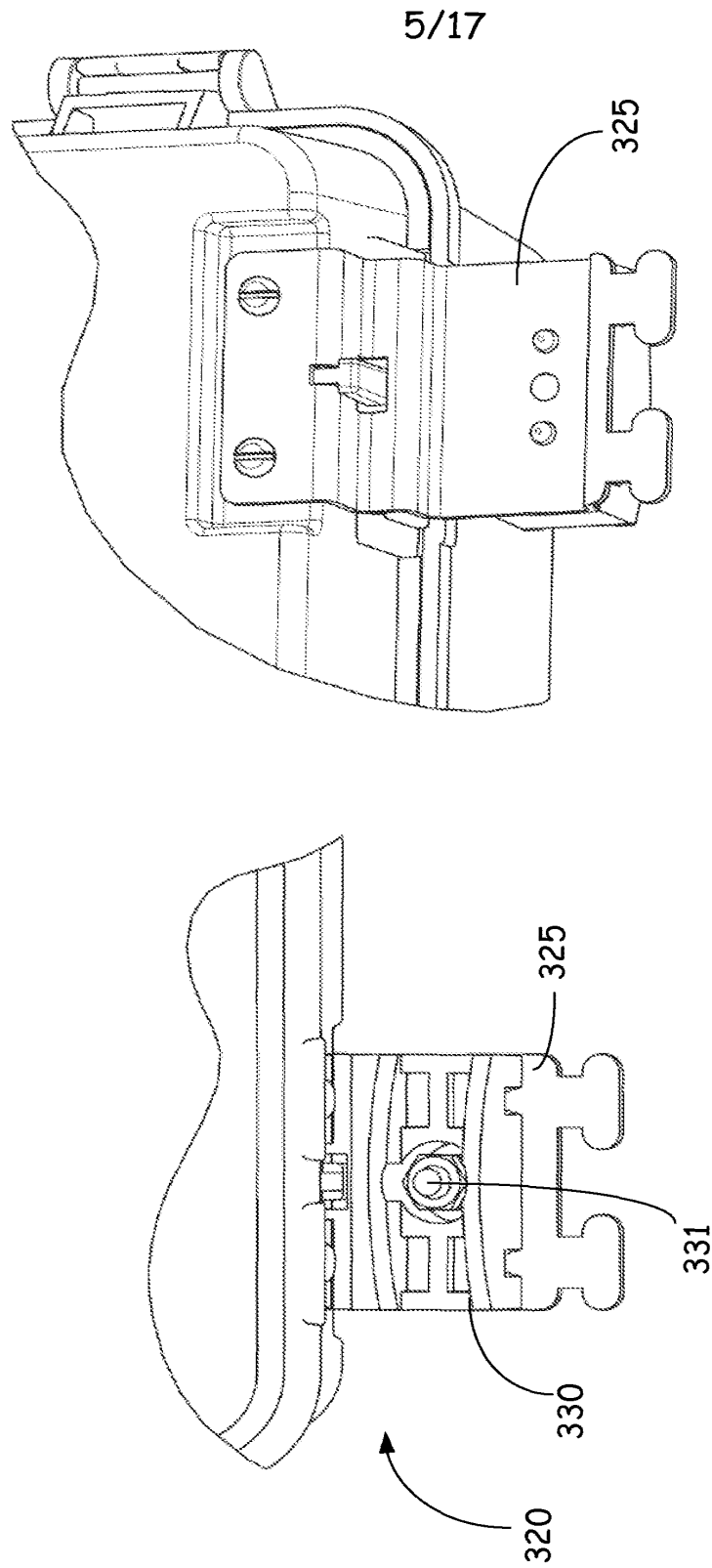


Fig. 3-2

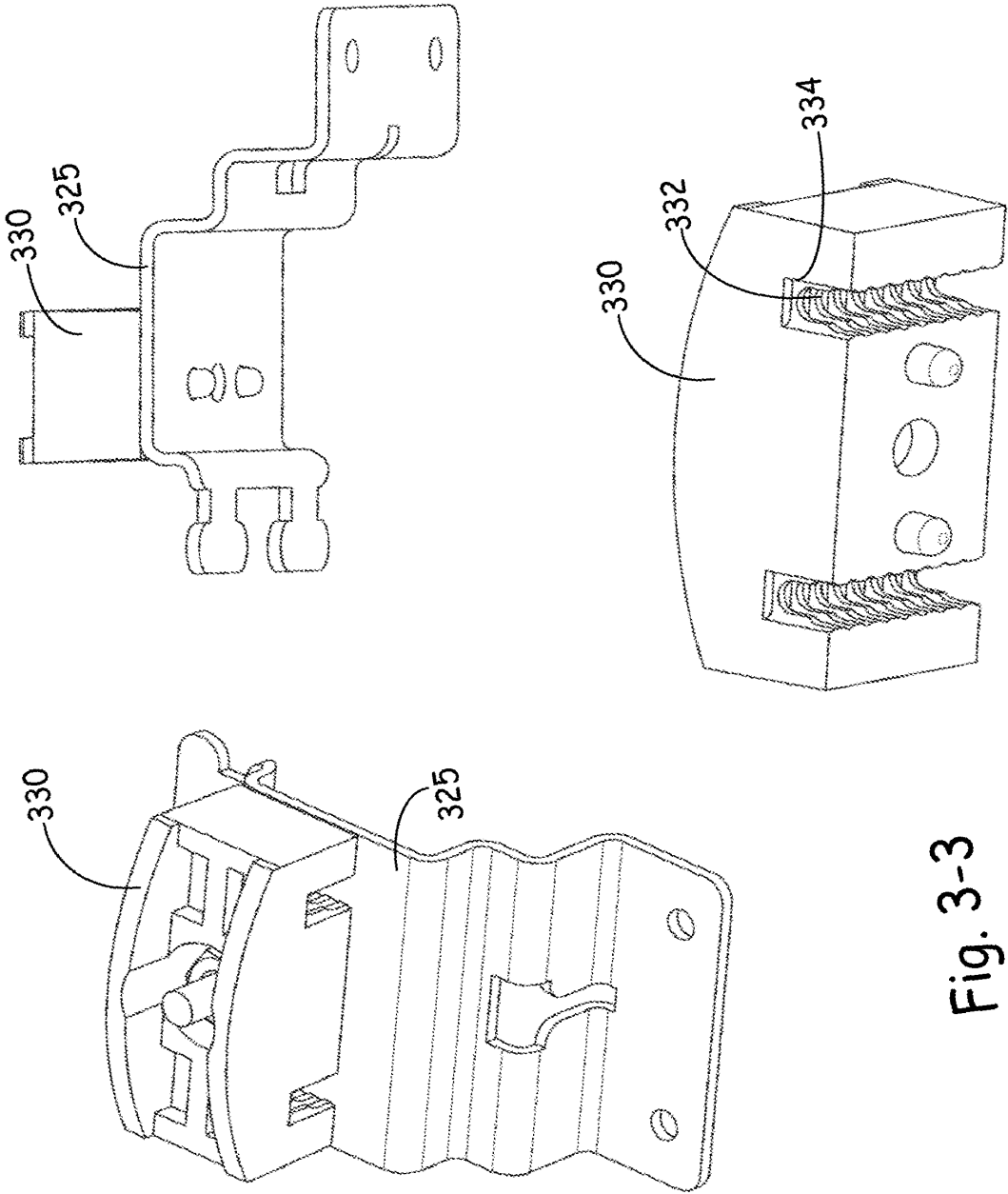


Fig. 3-3

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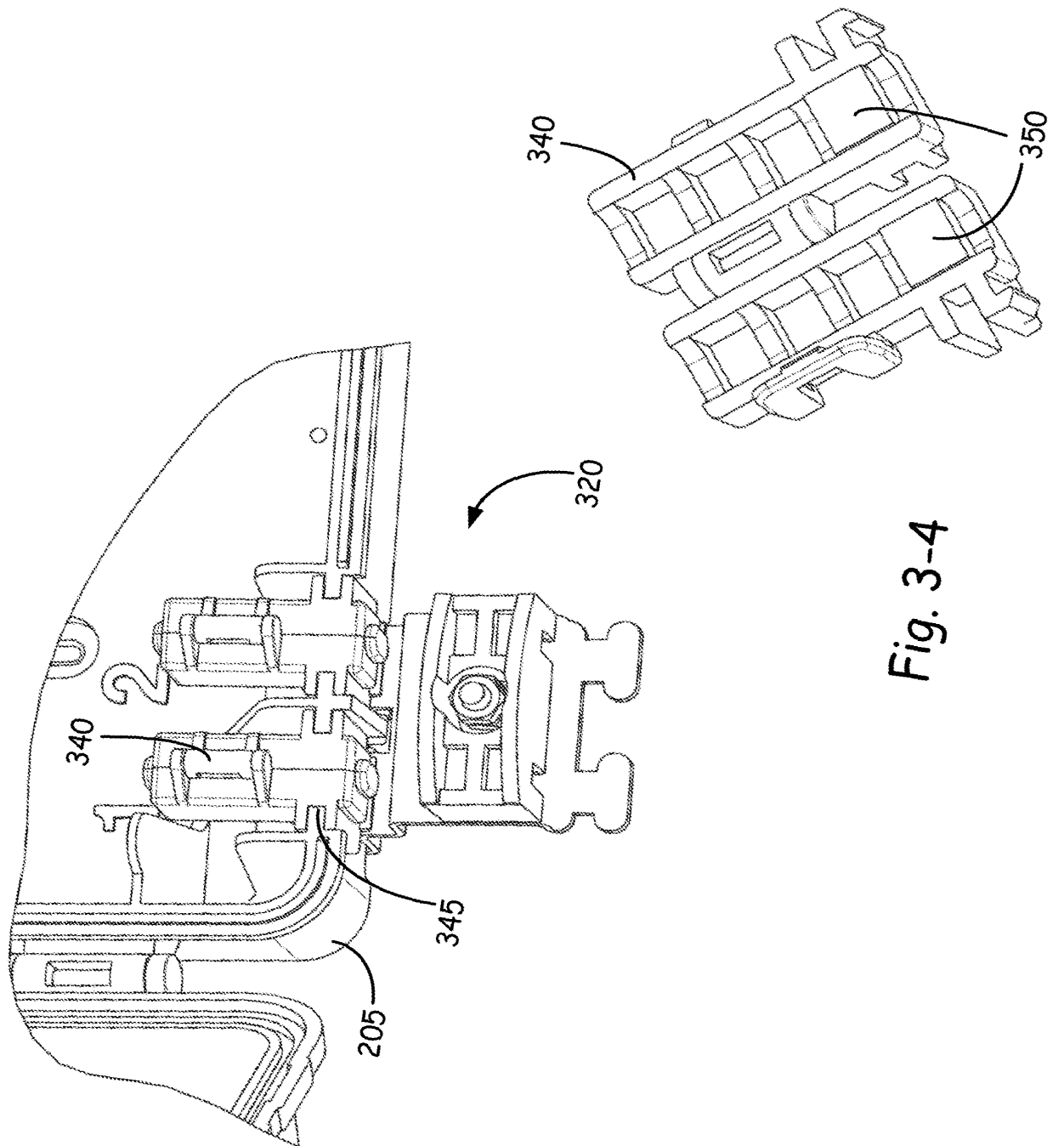


Fig. 3-4

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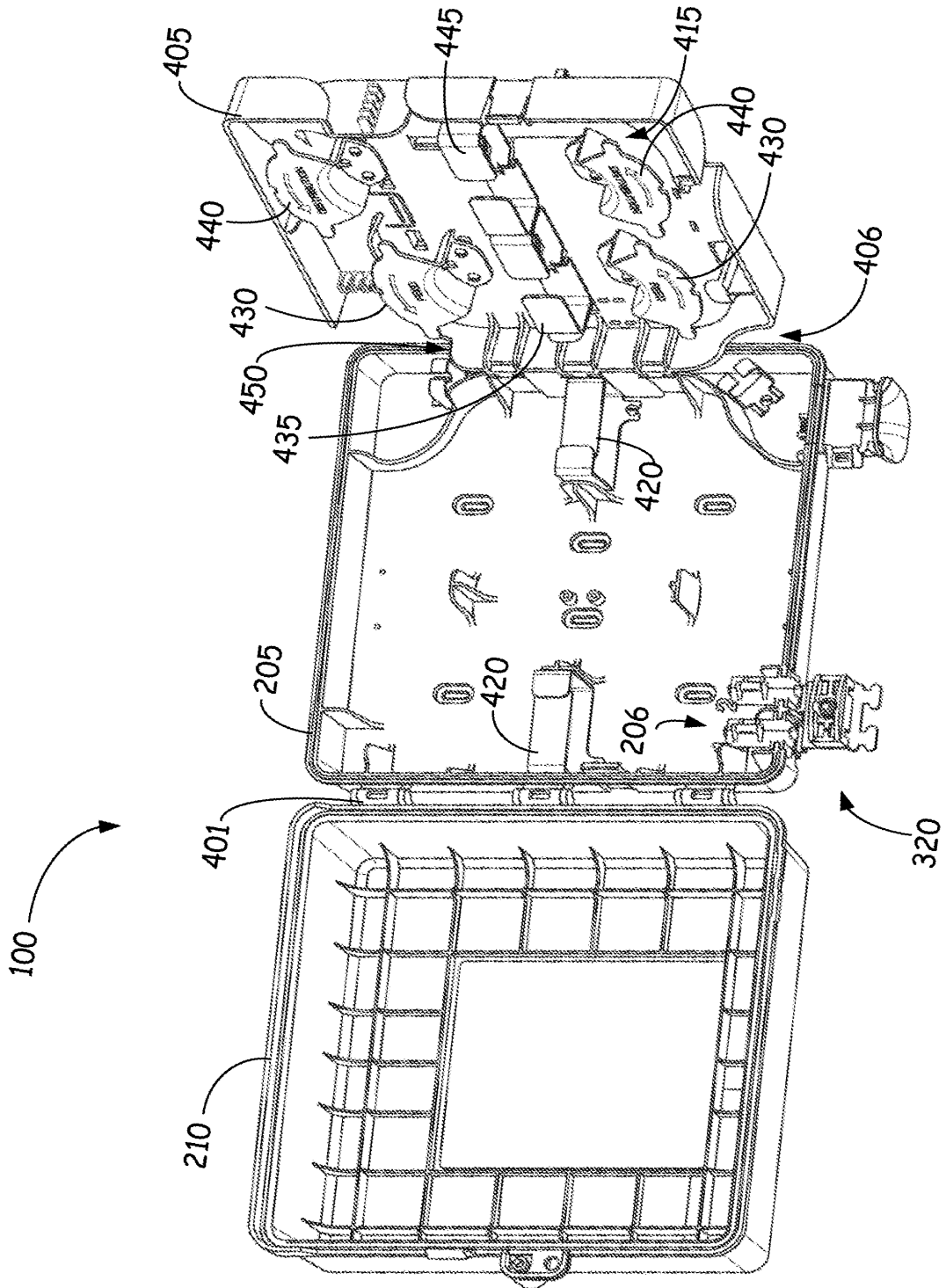


Fig. 4-1

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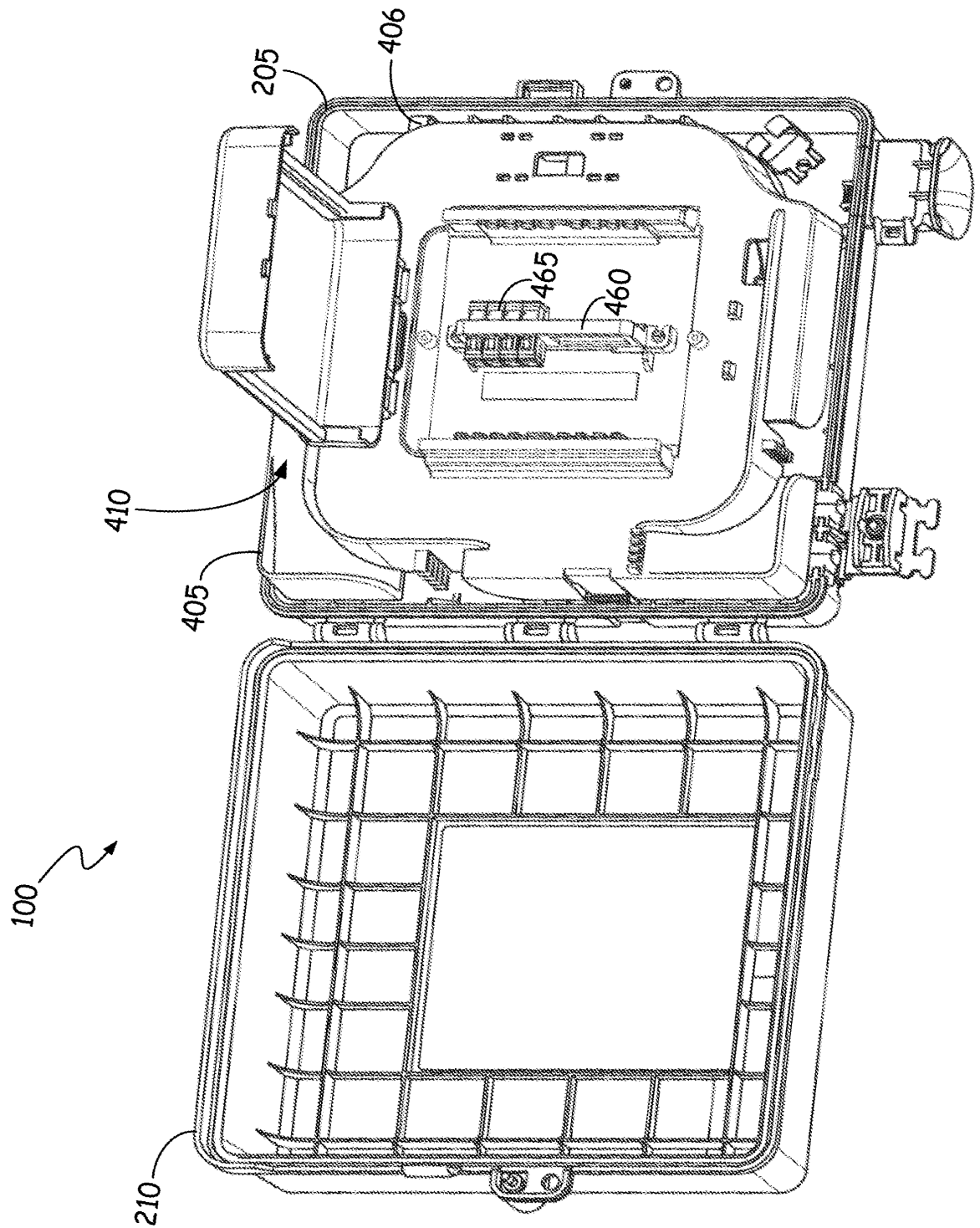


Fig. 4-2

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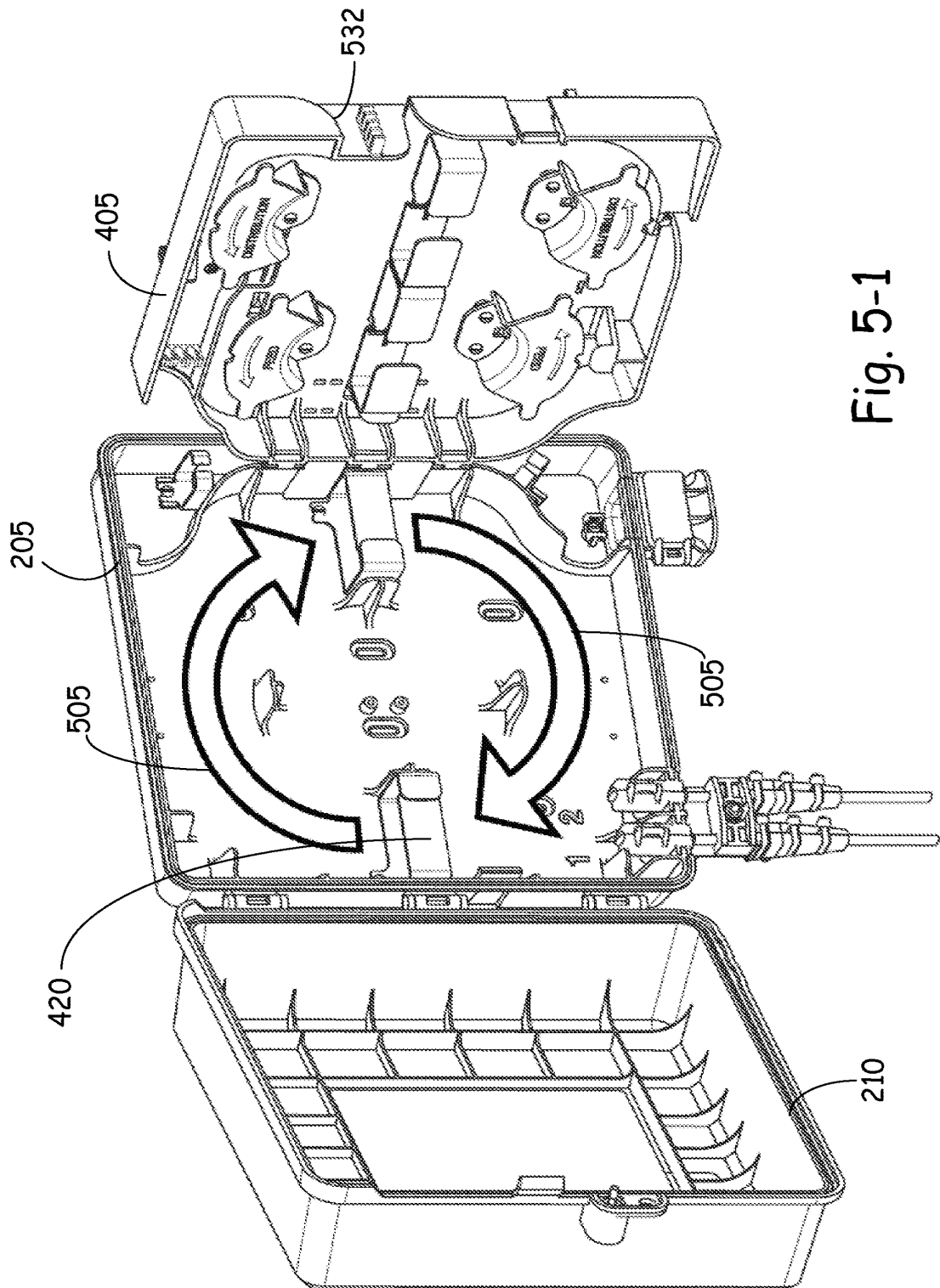


Fig. 5-1

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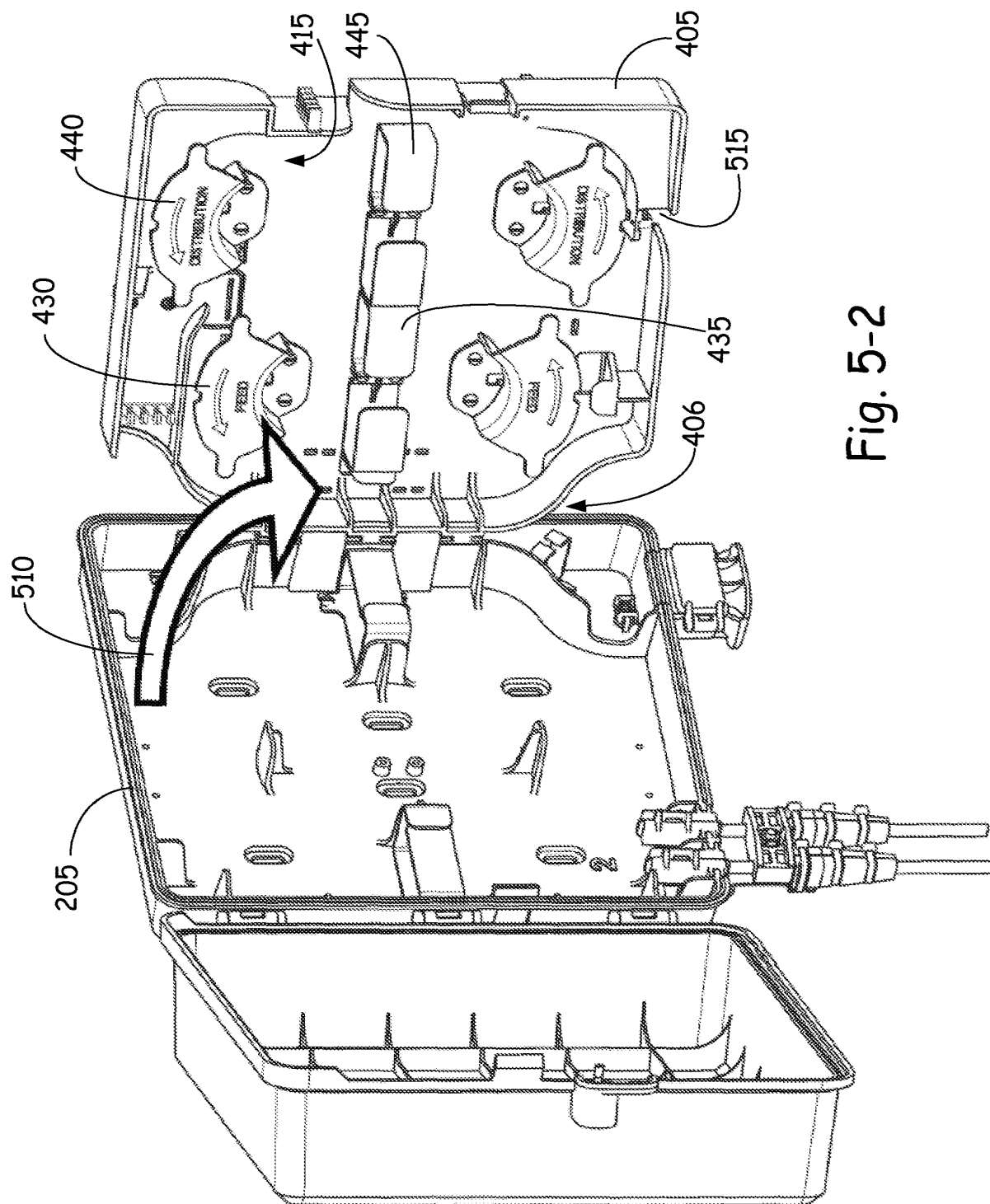


Fig. 5-2

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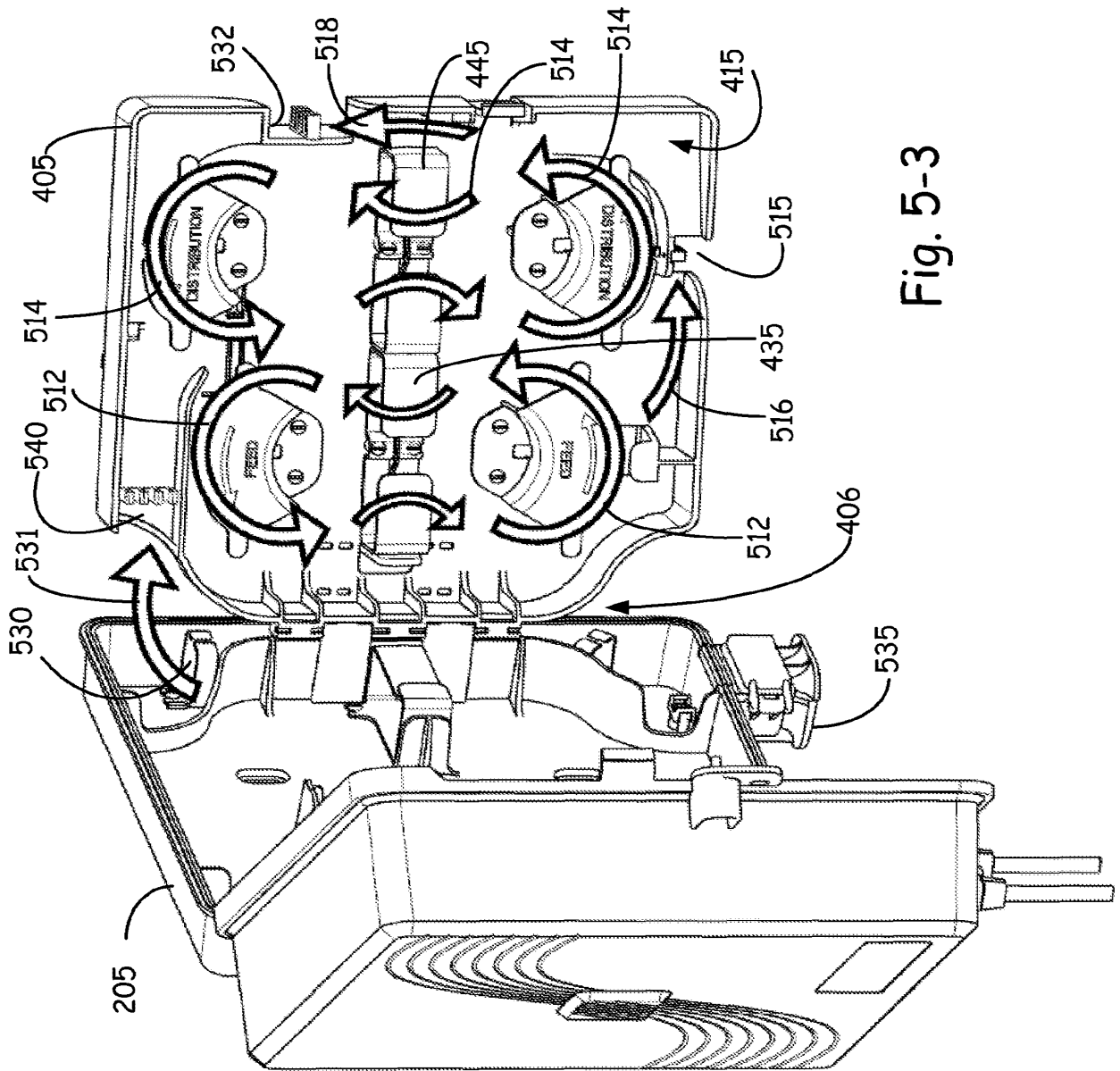


Fig. 5-3

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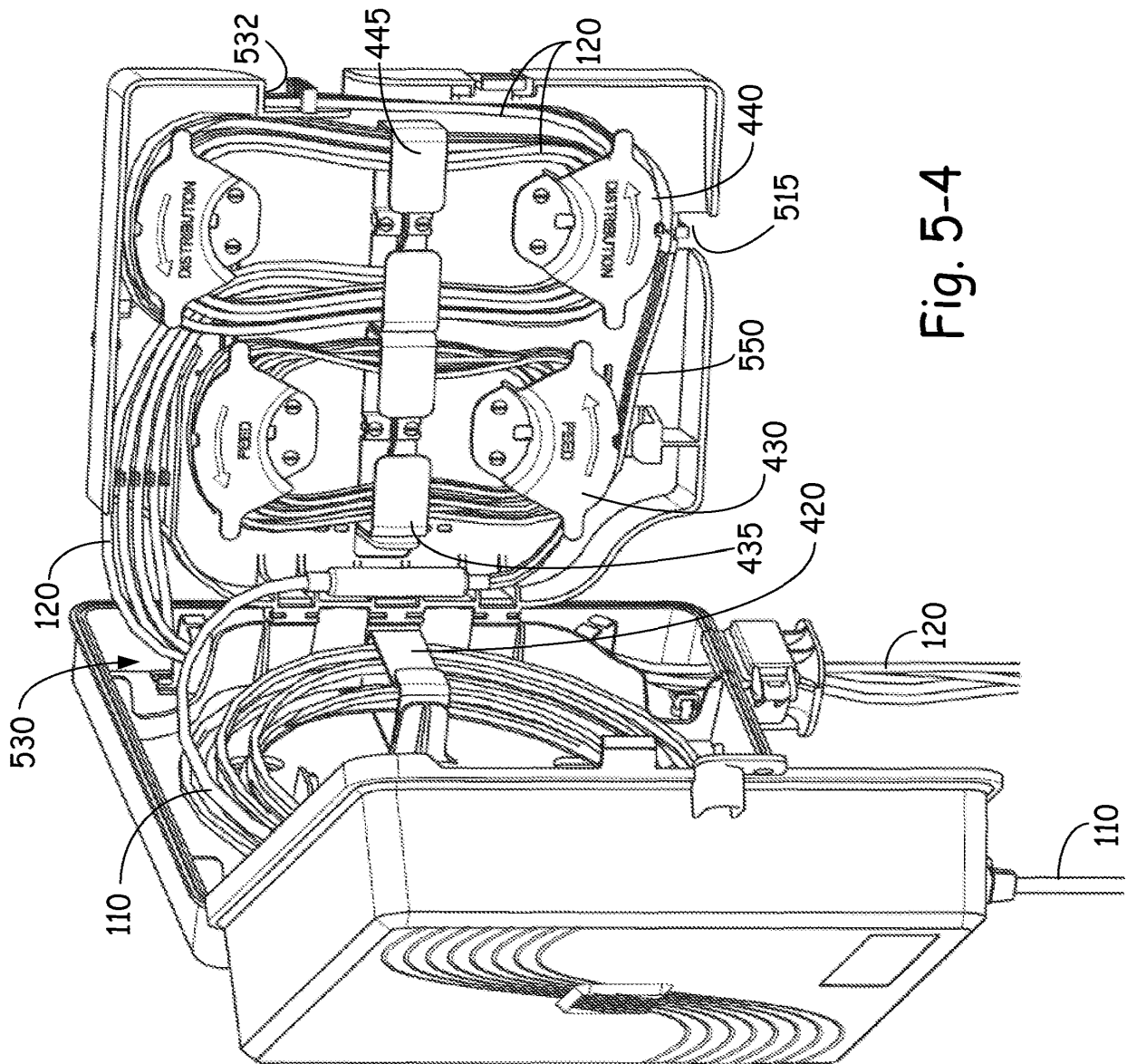


Fig. 5-4

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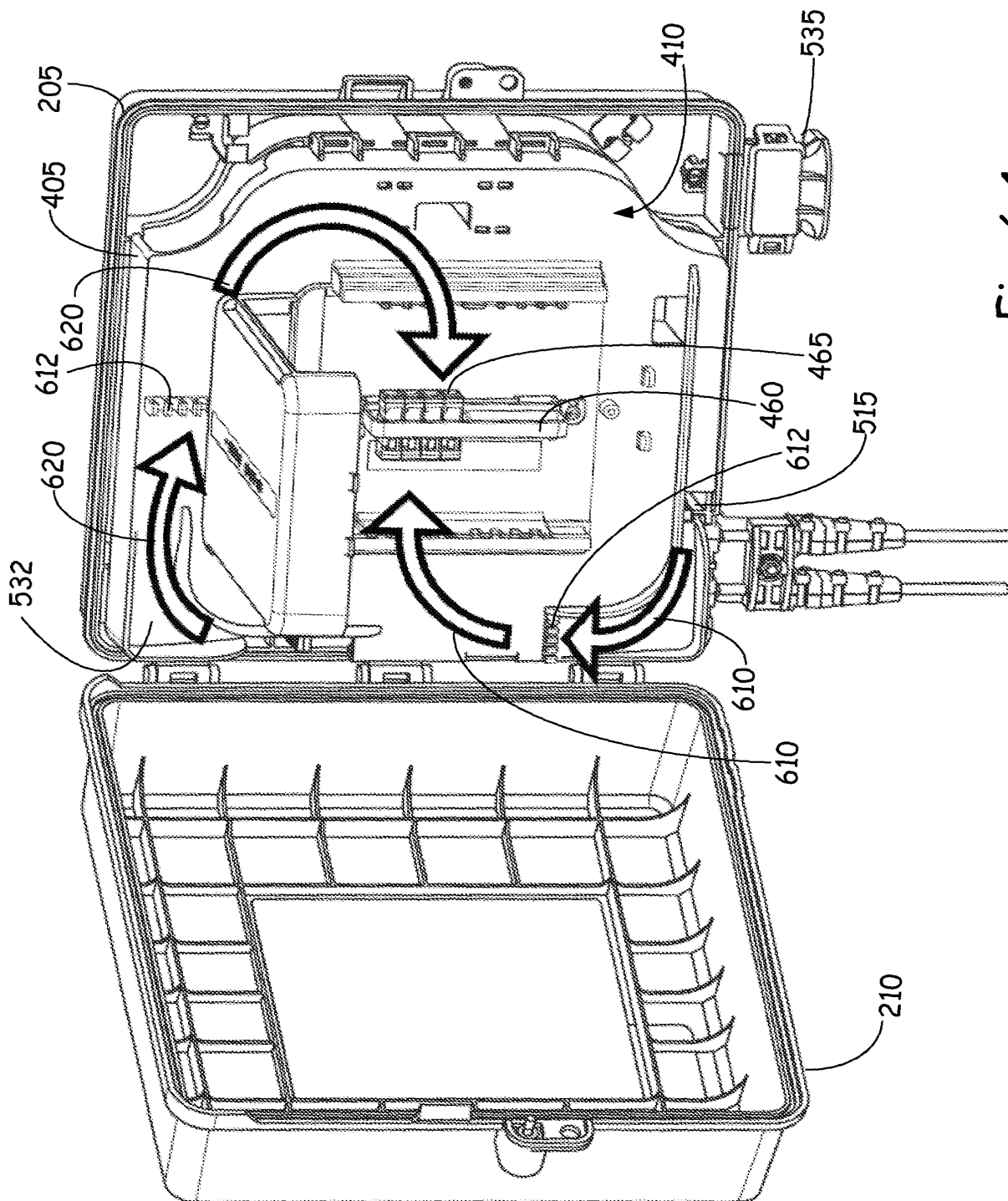
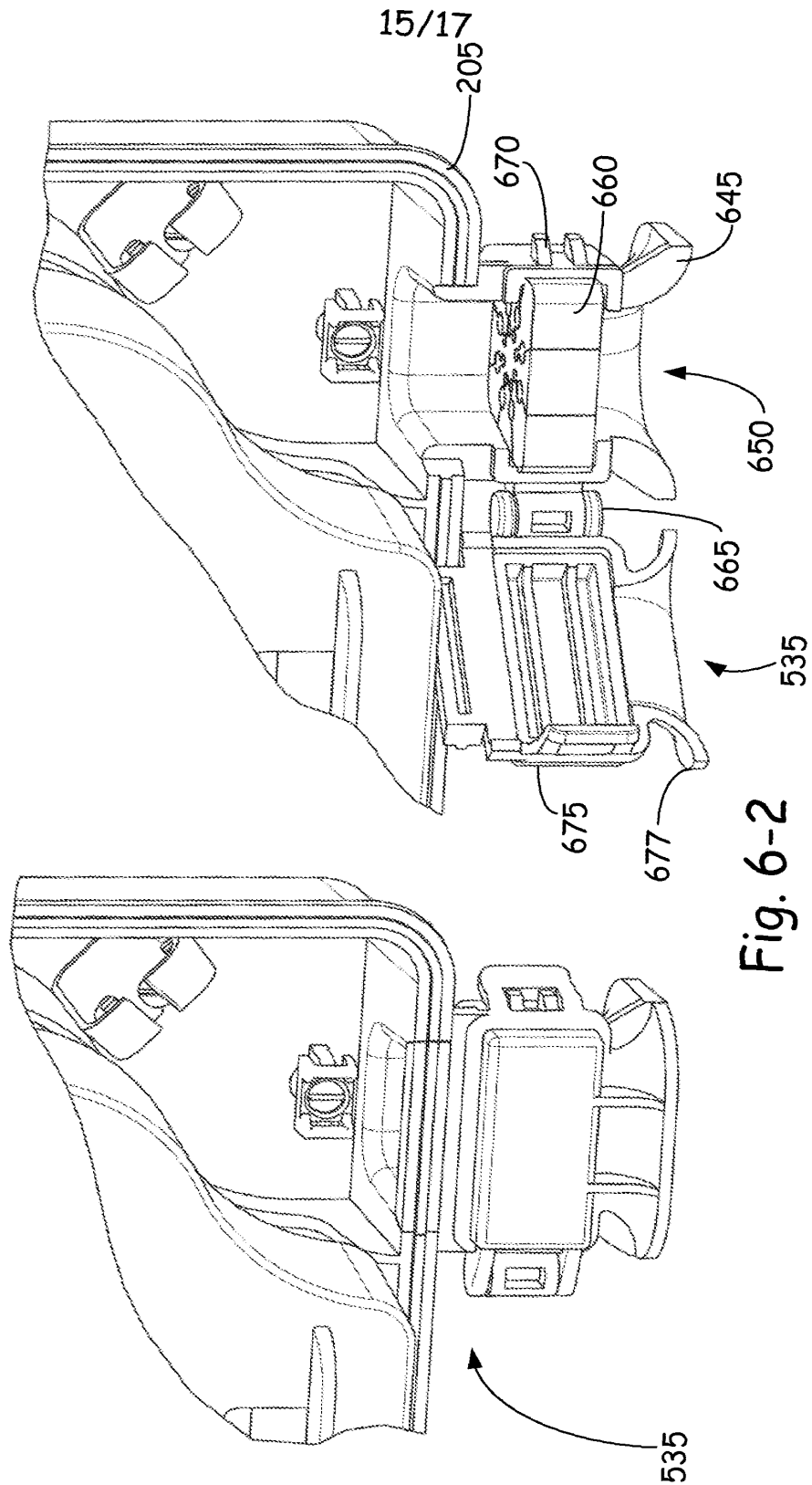


Fig. 6-1



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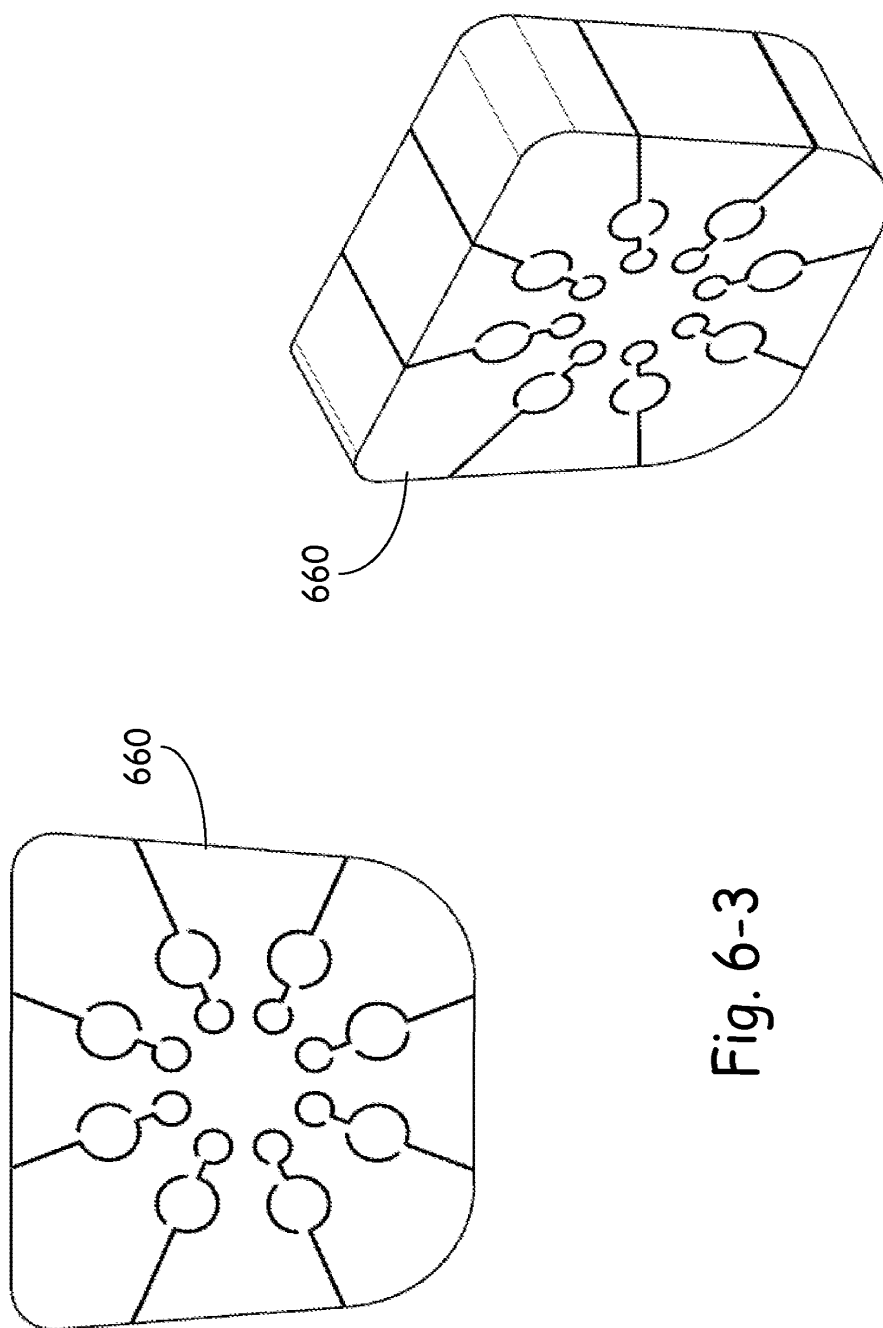


Fig. 6-3

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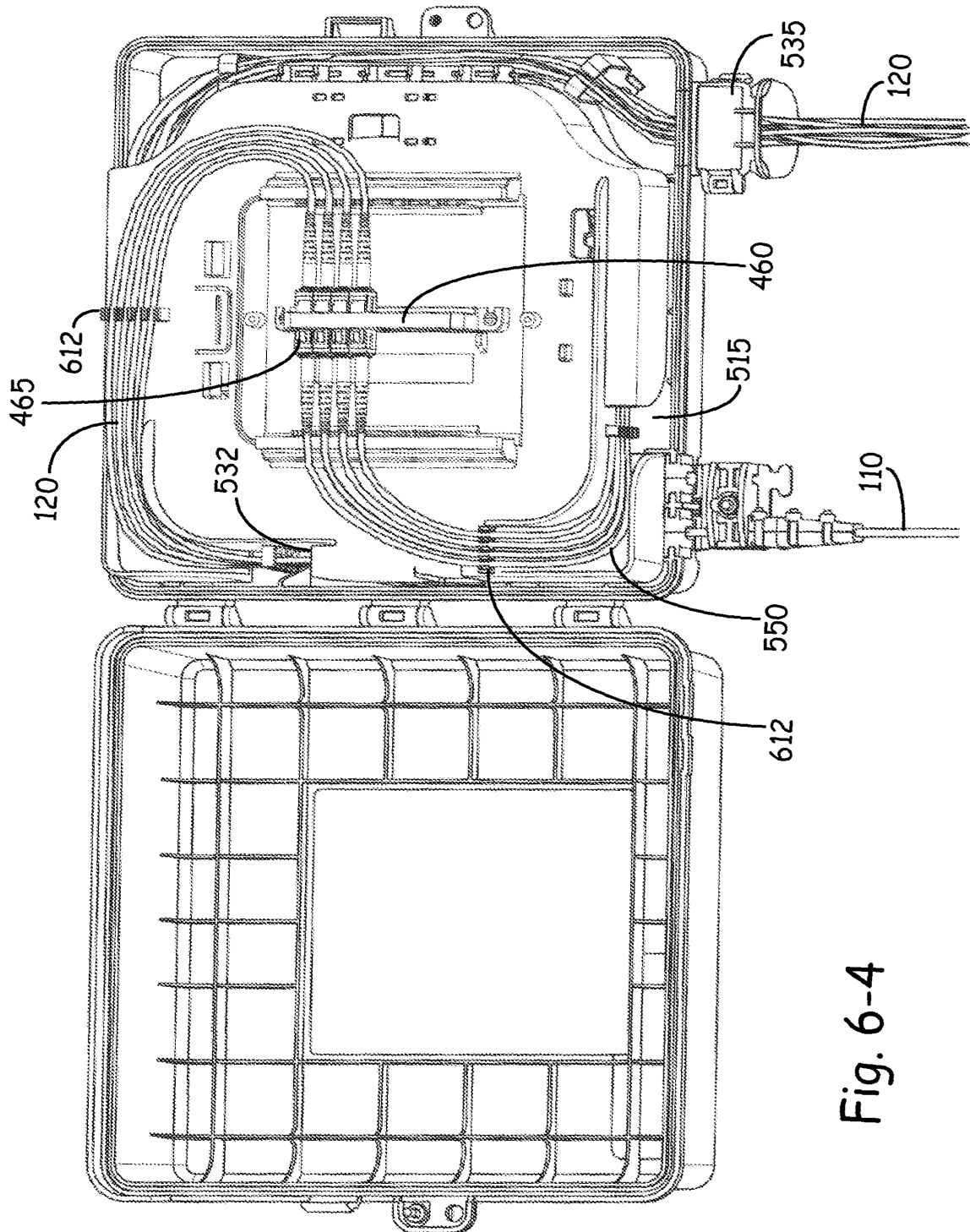


Fig. 6-4

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032320

A. CLASSIFICATION OF SUBJECT MATTER
INV. G02B6/44
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2009 109729 A (NITTO ELECTRIC WORKS LTD) 21 May 2009 (2009-05-21) abstract; figures 1-10 -----	1,11
X	US 2007/086721 A1 (DOBBINS PATRICK E [US] ET AL) 19 April 2007 (2007-04-19) paragraphs [0030], [0036], [0044], [0048]; figures 1-7 -----	1,2, 11-14
X	US 2003/103750 A1 (LAPORTE RICHARD B [US] ET AL) 5 June 2003 (2003-06-05) paragraph [0024]; figures 1-3,6 -----	1-4, 12-14
X	US 2009/202214 A1 (HOLMBERG MATTHEW [US] ET AL) 13 August 2009 (2009-08-13) paragraphs [0045], [0051] - [0053]; figures 6-11 ----- -/--	1,11

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

☒ See patent family annex.

* Special categories of cited documents :

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

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

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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

"&" document member of the same patent family

Date of the actual completion of the international search

21 June 2012

Date of mailing of the international search report

03/07/2012

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Authorized officer

Ciarrocca, Marco

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032320

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE WPI Week 200658 Thomson Scientific, London, GB; AN 2006-562752 XP002678329, -& JP 2006 195498 A (NIPPON TELEGRAPH & TELEPHONE CORP) 27 July 2006 (2006-07-27) abstract; figures 1-6 -& DATABASE EPODOC [Online] EUROPEAN PATENT OFFICE, THE HAGUE, NL; 27 July 2006 (2006-07-27), "OPTICAL CABLE CONNECTION BOX", XP002678330, Database accession no. JP-2006117485-A -----</p>	1
X	<p>US 5 109 467 A (HOGAN JOSEPH R [US] ET AL) 28 April 1992 (1992-04-28) column 3, lines 2-27; figures 2-4 -----</p>	1,3,12, 14
A	<p>US 2004/062508 A1 (BLANKENSHIP AARON I [US] ET AL) 1 April 2004 (2004-04-01) abstract; figures 1-6 paragraph [0012] -----</p>	1,3,11, 12,14

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

page 2 of 2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/032320

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2009109729 A	21-05-2009	JP 4883710 B2 JP 2009109729 A	22-02-2012 21-05-2009
US 2007086721 A1	19-04-2007	US 2007086721 A1 WO 2007011754 A2	19-04-2007 25-01-2007
US 2003103750 A1	05-06-2003	CA 2409594 A1 EP 1316829 A2 US 2003103750 A1	30-05-2003 04-06-2003 05-06-2003
US 2009202214 A1	13-08-2009	US 2009202214 A1 WO 2009076536 A1	13-08-2009 18-06-2009
JP 2006195498 A	27-07-2006	JP 3983261 B2 JP 2006195498 A	26-09-2007 27-07-2006
US 5109467 A	28-04-1992	NONE	
US 2004062508 A1	01-04-2004	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		Attorney Docket No. C64.12-0053
		U.S. Application No. (if known, see 37 CFR 1.5)
International Application No. PCT/US2012/032320	International Filing Date April 5, 2012	Priority Date Claimed April 5, 2011
Title of Invention OPTICAL FIBER CABLE DROP INTERFACE BOX		
First Named Inventor Nicholas B.Larsson et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.		
1. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.		
2. ☒ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).		
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))		
a. ☒ is attached hereto.		
b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).		
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))		
a. ☒ is attached.		
b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).		
Items 5 to 8 below concern amendments made in the international phase.		
<u>PCT Article 19 and 34 amendments</u>		
5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).		
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).		
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).		
<u>Cancellation of amendments made in the international phase</u>		
8a. ☒ Do not enter the amendment made in the international phase under PCT Article 19.		
8b. ☒ Do not enter the amendment made in the international phase under PCT Article 34.		
NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).		
The following items 9 to 17 concern a document(s) or information included.		
9. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.		
10. ☒ A preliminary amendment.		
11. ☒ An Application Data Sheet under 37 CFR 1.76.		
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).		
13. ☐ A power of attorney and/or change of address letter.		
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.3 and 37 CFR 1.821-1.825.		
15. ☐ Assignment papers (<i>cover sheet and document(s)</i>). Name of Assignee: _____		
16. ☐ 37 CFR 3.73(c) Statement (<i>when there is an Assignee</i>). _____		

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No. PCT/US2012/032320	ATTORNEY DOCKET No. C64.12-0053
17. ☒ Other items or information: <div style="font-size: 1.2em; margin-left: 20px;">Search Report Abstract</div>		
The following fees have been submitted.		CALCULATIONS PTO USE ONLY
18. ☒ Basic national fee (37 CFR 1.492(a)) \$280		\$ 140.00
19. ☒ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) \$0 All other situations \$720		360.00 \$
20. ☒ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) \$0 Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority \$120 International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB \$480 All other situations \$600		240.00 \$
TOTAL OF 18, 19, and 20 =		\$ 740.00
☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)). Fee for each additional 50 sheets of paper or fraction thereof \$400		
Total Sheets	Extra Sheets	Number of each addition 50 or fraction thereof (round up to a whole number)
- 100 =	/ 50 =	x \$400
Surcharge of \$140.00 for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).		\$
CLAIMS	NUMBER FILED	NUMBER EXTRA
Total claims	- 20 =	x \$80
Independent claims	- 3 =	x \$420
MULTIPLE DEPENDENT CLAIM(S) (if applicable)		+ \$780
Processing fee of \$140.00 for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)).		\$
TOTAL OF ABOVE CALCULATIONS =		\$ 740.00
☐ Applicant asserts small entity status. See 37 CFR 1.27. Fees above are reduced by ½.		
☐ Applicant certifies micro entity status. See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.		
TOTAL NATIONAL FEE =		\$ 740.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property.		\$
TOTAL FEES ENCLOSED =		\$ 740.00
		Amount to be refunded: \$
		Amount to be charged: \$

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

- a. ☐ A check in the amount of \$_____ to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$_____ to cover the above fees.
- c. ☒ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 23-1123 as follows:
- i. ☐ any required fee.
- ii. ☒ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).
- d. ☒ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.
- ADVISORY:** If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is **not** recommended and by doing so your **credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

- ☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013, and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

Correspondence Address

- ☒ The address associated with Customer Number: 27367 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country				Telephone	
Email					

Signature	/John Veldhuis-Kroeze/	Date	October 4, 2013
Name (Print/Type)	John D. Veldhuis-Kroeze	Registration No. (Attorney/Agent)	38354

Privacy Act Statement

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

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

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Nicholas	B.	Larsson		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Blomkest	State/Province	MN	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		219 Schendel Street			
Address 2		PO Box 152			
City	Blomkest	State/Province	MN		
Postal Code	56216	Countryi	US		
Applicant 2					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Andrew	E.	Swinton		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Plymouth	State/Province	MN	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		4570 Ranier Court North			
Address 2					
City	Plymouth	State/Province	MN		
Postal Code	55446	Countryi	US		
Applicant 3					Remove
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	☐ Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix	
	George	I.	Wakileh		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Batavia	State/Province	IL	Country of Residence i	MN

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053	
		Application Number		
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX			
Citizenship under 37 CFR 1.41(b) i		US		
Mailing Address of Applicant:				
Address 1	440 Judd Lane			
Address 2				
City	Batavia	State/Province	IL	
Postal Code	60510	Country ⁱ	US	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence information of this application.	
Customer Number	27367
Email Address	<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
Attorney Docket Number	C64.12-0053	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	17	Suggested Figure for Publication (if any)	

Publication Information:

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

Representative Information:

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
Customer Number	27367		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/US2012/032320	2012-04-05
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

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

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.			
Assignee 1			Remove
If the Assignee is an Organization check here. ☒			
Organization Name			
Mailing Address Information:			
Address 1			
Address 2			
City	State/Province		
Country ⁱ	Postal Code		
Phone Number	Fax Number		
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			Add

Signature:

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053		
		Application Number			
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX				
Signature	/John Veldhuis-Kroeze/			Date (YYYY-MM-DD)	2013-10-04
First Name	John	Last Name	Veldhuis-Kroeze	Registration Number	38354

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		OPTICAL FIBER CABLE DROP INTERFACE BOX		
First Named Inventor/Applicant Name:		Nicholas B. Larsson		
Filer:		John Douglas Veldhuis-Kroeze/Theresa Sorbel		
Attorney Docket Number:		C64.12-0053		
Filed as Small Entity				
U.S. National Stage under 35 USC 371 Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Basic National Stage Fee	2631	1	140	140
Natl Stage Search Fee - Report provided	2642	1	240	240
Natl Stage Exam Fee - all other cases	2633	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				740

Electronic Acknowledgement Receipt	
EFS ID:	17041967
Application Number:	14009955
International Application Number:	PCT/US12/32320
Confirmation Number:	5445
Title of Invention:	OPTICAL FIBER CABLE DROP INTERFACE BOX
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Theresa Sorbel
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	04-OCT-2013
Filing Date:	
Time Stamp:	15:27:20
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$740
RAM confirmation Number	2109
Deposit Account	231123
Authorized User	VELDHUIS-KROEZE, JOHN D.
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		PCT_application_filed.pdf	105029 a359d6a81301ef77b0a512fa1a48fec8abe5b3b8	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	9	
	Claims		10	12	
	Abstract		13	13	
Warnings:					
Information:					
2		2013-10-04Preliminary_Amendment.pdf	47916 4a9561a613ce8d46c5d29fc78c253aa978588c49	yes	7
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Preliminary Amendment		1	1	
	Specification		2	2	
	Claims		3	5	
	Abstract		6	6	
	Applicant Arguments/Remarks Made in an Amendment		7	7	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	2013-10-04figures.pdf	2098137 517e04db6d8b4258ff106c79897cf325a504a126	no	17
Warnings:					
Information:					

4	Oath or Declaration filed	2013-10-04Declaration.pdf	1293876	no	9
			58e6fc9e901d9c041923188e85a6a0aa86e2455d		
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	2013-10-04IDS.pdf	612431	no	4
			f61a8cb8565eb6948dbdf94434c46db43990169e		
Warnings:					
Information:					
6	Foreign Reference	JP2006195498.pdf	534762	no	11
			e1c16655ccf5fe6f386ae019e0d939ea0cf6765f		
Warnings:					
Information:					
7	Foreign Reference	JP2009109729.pdf	726371	no	14
			46919ab133ac481b9392e025a9420704808aa513		
Warnings:					
Information:					
8	Non Patent Literature	SRWO.pdf	1032854	no	13
			ebe351c79ede3d530ba23da8f1b545e37c1486e7		
Warnings:					
Information:					
9	Documents submitted with 371 Applications	publication.pdf	1870289	no	34
			8b46fc11edcb5501227461ac958fc388c13804f8		
Warnings:					
Information:					
10	Transmittal of New Application	2013-10-04Transmittal.pdf	219210	no	4
			e4a0c434478b22b555c00fd691394ab86498aa2a		
Warnings:					
Information:					
11	Application Data Sheet	2013-10-04ADS.pdf	1421166	no	5
			239324da42d997f42569fd9602a8b56ef2ce1834		
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12	Fee Worksheet (SB06)	fee-info.pdf	33006	no	2
			21d965b95a2cb617cf5b5d6c300ef8e04cd45c10		
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DROP INTERFACE BOX

BACKGROUND

[0001] Disclosed embodiments relate to connection of an optical fiber feed or “drop” cable from an optical fiber service provider to a distribution point at a residence, dwelling or other building, such as a multi-unit dwelling. More particularly, disclosed embodiments relate to an enclosure for distribution of a passive optical fiber network. The enclosure will generally be mounted on a multi-dwelling residence, but can be mounted anywhere such distribution of a passive optical fiber network is desired to provide vertical, horizontal with one or multiple buildings in addition to providing building to building distribution using a variety of splice or termination options like ribbon splice or terminations.

[0002] Optical fiber is used in different delivery topologies to provide network access, for example internet access, to homes, businesses and other premises. Fiber to the x (FTTx) is a collective term for various optical fiber delivery topologies that are categorized according to where the fiber terminates. Optical fiber has commonly been used for long-distance parts of the network, but other communications media such as metal cabling has frequently been used in delivery to the customer premises. However, increasingly, optical fiber is being used to provide network access all of the way to the customer premises, and even within the customer premises.

[0003] Typically, a feed or drop optical fiber cable is provided to a premises, by an optical fiber service provider, from a larger distribution point or connection (e.g., a pole mounted distribution point). The feed is typically a heavy jacketed or hardened multi-fiber cable that is broken out at the premises into individual fiber connections. This is for example commonly the case at multi-dwelling residential buildings or at buildings that house multiple different businesses. Individual distribution fiber cables from inside each living or workplace unit are connected with adapters to the individual feed fiber optical cable connections from the multi-fiber drop cable.

[0004] Increasingly, optical fiber cables are pre-connectorized—that is they are shipped from a factory with terminating connectors already installed. This can lead to the need for installers to deal with excess optical fiber cable length in many instances. Other factors can also result in excess cable length. Storage of the excess cable length can be problematic, as can organization of the drop optical fiber cable, the multiple individual feed optical fiber cables, and the multiple individual distribution optical fiber cables which are connected to the

individual living or workplace units. The fact that the various optical fiber cables are pre-connectorized provides other challenges when attempting to store or organize the cables. Also, there is a need to protect the optical fiber cables from excessive strain, as well as from damage due to bending the cables at too small of a bend radius.

[0005] The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter.

SUMMARY

[0006] Disclosed are exemplary embodiments of a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel includes spools, cable clips and integrated cable channels that maintain cable radius during transitions of cables from a storage side or plane of the panel to a connector side or plane of the panel.

[0007] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a diagrammatic illustration of the use of a drop interface box (DIB) in accordance with disclosed embodiments.

[0009] Fig. 2-1 and 2-2 are perspective views of the DIB illustrated in Fig. 1.

[0010] Figs. 3-1 through 3-4 are illustrations of features of exemplary DIB embodiments which provide weather resistant seals, minimize strain on fiber cables, and prevent cable damage due to bending.

[0011] Figs. 4-1 and 4-2 are views of a base, cover and hinged fiber storage panel of a DIB in accordance with exemplary embodiments.

[0012] Figs. 5-1 through 5-3 are diagrammatic illustrations of drop, feed and distribution cable routing and storage in exemplary DIB embodiments.

[0013] Fig. 5-4 is a view of an exemplary DIB showing drop, feed and distribution cable routed and stored as shown in Figs. 5-1 through 5-3.

[0014] Fig. 6-1 is a diagrammatic illustration of feed and distribution cable routing to a front side of the fiber storage panel in accordance with exemplary embodiments.

[0015] Figs. 6-2 and 6-3 are diagrammatic illustrations of distribution cable entrance features which provide weather resistant sealing and prevent cable damage due to bending.

[0016] Fig. 6-4 is a view of an exemplary DIB showing feed and distribution cable routing to the front side of the fiber storage panel in accordance with exemplary embodiments as shown in Fig. 6-1.

DETAILED DESCRIPTION

[0017] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.

[0018] Disclosed embodiments include a drop interface box (DIB) which provides an easy to use and reliable solution to FTTx deployments using factory terminated optical cable assemblies. The disclosed DIB includes integrated slack storage compartments which provide ample room to store excess cable length while maintaining separation of hardened drop, feeder breakout, and distribution cables. This unique slack storage design allows for drop and distribution cables to be added quickly and easily as demand increases. Use of the disclosed DIB is not limited to use with these pre-connectorized optical cables

[0019] Referring now to Fig. 1, shown is a diagrammatic illustration of the use of DIB 100 in accordance with exemplary embodiments. DIB 100 mounts at a desired location of a premises 130, which will typically be a multi-dwelling or multi-business type of premises in

which multiple individual living spaces or units are included in a single larger building. However, DIB 100 is not limited to use in this type of premises. DIB 100 is configured to receive and partially house a hardened “drop” cable 110 from an optical fiber service provider distribution point 105, which can be, for example, a pole mounted box connected to the provider’s network. Inside of DIB 100, drop cable 110 is split into feeder breakout cables 550 (shown in Fig. 5-4) and converted into multiple distribution cables 120 which are connected in or to the individual units or locations 125 of premises 130. DIB 100 has numerous features, described below in detail, which aid in the organization and storage of the various cables, including pre-connectorized cables.

[0020] Referring now to Figs. 2-1 and 2-2, shown are side and front perspective views of DIB 100 in accordance with an exemplary embodiment. As shown in these Figs., DIB 100 includes a base unit 205 and a door or cover 210 which has a hinged connection to the base unit. A push to close cover latch 215 secures cover 210 to base unit 205 in a closed position, and a security screw housing 220 is formed with or in cover 210 and is configured to receive a security screw 222 for denying entry into DIB 100 to persons without a proper tool. For instance, in an exemplary embodiment, security screw 222 is a 3/8 inch security screw which is configured to be used with a “216 tool” of the type which is well known in the art. For further security, a padlock hasp 225 is also included in an exemplary embodiment for receiving a padlock (not shown) to lock cover 210 to base unit 205 in a closed position. In one exemplary embodiment, padlock hasp 225 can be integrally formed with the material of cover 210 and base unit 205. For example, in an exemplary embodiment cover 210, base unit 205 and the above-described components (not including security screw 222) are formed of a plastic material. In other embodiments, hasp 225 and/or other components are formed of other materials (e.g., metals) which are attached to cover 210 and/or base unit 205.

[0021] DIB 100 includes features which enable the entry of pre-connectorized cables (e.g., cables 110 and/or 120) into the DIB by an installer. A drop cable entrance 206 is configured to receive a drop cable from an optical service provider. Many conventional enclosures require cable to be fed through slots or apertures of a size which cannot accommodate pre-connectorized cables, but DIB 100 utilizes unique features to accommodate pre-connectorized cables. Yet other features of DIB 100 help to prevent damage to cables due to strain or bending. Both features that facilitate the use of pre-connectorized cables, and features that prevent strain or bending damage to the cables, are illustrated in detail in Figs. 3-1 through 3-4.

[0022] Shown in Fig. 3-1 is a bend limiting cable boot 305 which is formed in a flexible molded clam-shell design to allow the boot to be installed over the pre-connectorized drop cable 110 without having to feed the cable through the boot. The boot 305 has a central channel 309 in which cable 110 is positioned when the two portions of the boot are closed together. Slots 307 are formed in the boot 305 so that the boot is secured to the cable 110 and to a cable clamp bracket (shown in Fig. 3-2) using standard cable ties 311, commonly available to installers. The flexible material, for example rubber, and tapered shape of boot 305 supports the cable 110, preventing a sharp bend in the cable at the edge of the strain-relief clamp 320 (shown in Fig. 3-2) when the cable 110 is pulled in any direction.

[0023] Referring now more particularly to Figs. 3-2 and 3-3, shown are components of a strain-relief cable clamp 320 which comprises a mounting bracket 325 and rigid clamp block 330 that engages the cable jacket of cable 110 in order to retain the cable position when axial force is applied to the cable. One or more threaded fasteners 331 provide a mechanical advantage while engaging the clamp block 330 and cable jacket. The position of the threaded fastener 331 and the shape of the clamp block 330 provide limited access to the general public while allowing the installer to use a “216 wrench”, commonly available to telcom installers. In exemplary embodiments, during factory assembly of the clamp components, the treaded fastener 331 is deformed to prevent clamp components from being separated during field operation. This prevents dropping or losing the components during operation. As is seen in the illustration of Fig. 3-3 which shows clamp block 330 isolated and from a bottom perspective view, the rigid clamp block has ribs/ridges 332 in the cable channels 334 to help keep the cable from slipping when clamped onto the drop cable 110.

[0024] Referring now to Fig. 3-4, shown is a weather proof or weather resistant cable entrance clip feature of DIB 100 in accordance with an exemplary embodiment. In the illustrated exemplary embodiment, cable clips 340 are of a rigid clam shell design to clip over the cable 110 without feeding the cable through. The clips 340 slide into flanges or slots 345 inside of the base 205 in an area adjacent to relief cable clamp, which is outside of base 205, to create a substantially weather tight seal between the clips 340 and base 205 of DIB 100. Closed cell foam gaskets 350 create a weather tight seal between the clips and cable jacket.

[0025] Referring next to Figs. 4-1 and 4-2, shown are the multiple storage compartments or features. As shown, base unit 205 has a hinged connection 401 to cover 210. A fiber storage panel 405 also has a hinged connection 406 to an opposing side of base unit 205. The hinged fiber storage panel 405 has a first or front side 410 (shown in Fig. 4-2) and a second

or rear side 415 (shown in Fig. 4-1), both having unique features which aid in providing storage and organization of the various cables described above.

[0026] Base unit 205 includes drop cable storage clips 420. The drop feed cable 110, which enters DIB 100 above the position of strain-relief cable clamp 320 as described above, is fed around the storage clips 420 and stored in the base unit 205 of the DIB. On the rear side 415 of the hinged fiber storage panel 405, there are two sets of spools 430 and 440 and two sets of corresponding storage clips 435 and 445. Spools 430 and storage clips 435 store feed cables 550 (shown in Fig. 5-4). Spools 440 and clips 445 store distribution cables 120. A break-out or furcation plug 450 positioned near the upper end of hinged connection 406 divides the drop feed cable 110 into multiple (e.g., typically four) individual feed cables 550.

[0027] On the front side 410 of hinged fiber storage panel 405 is an adapter bracket 460 which holds one or more connectors or adapters 465, such as four-to-eight port adapters. Adapters 465 convert between the feed cables 550 and the distribution cables 120. The connectors or adapters 465 are standard components used in the telecommunications industry for converting optical fiber signals between feed cables and distribution cables. However, positioning adapters 465 on the front side of hinged panel 405, and in an exemplary embodiment at a center location on the front side of the hinged panel opposite the storage spools and clips positioned on the rear side of the panel, allows for routing of both of the feed cables and the distribution cables while maintaining proper bend radius. Hinged storage panel 405 and DIB include further features, which are described below with reference to Figs. 5-1 through 5-4 and 6-1 through 6-4, that aid in routing and storage of these cables while maintaining a proper bend radius.

[0028] Referring now to Fig. 5-1, shown are mechanisms for, and a method of, storing the feeder cable with outdoor jacket, namely drop cable 110. The above-mentioned cable storage clips 420 are situated in the base 205 to retain coils of the outdoor jacketed feeder cable without unnecessary stress on the cable or violating minimum bend radius. Using storage clips 420, the cable 110 is coiled in the direction as shown at arrows 505 in accordance with the preferential bend axis or radius for the particular cable type.

[0029] Referring now to Fig. 5-2, shown is arrow 510 representing the routing of cable 110 from base 205 to the rear side 415 of hinged fiber storage panel 405. As discussed above, panel 405 is hinged to provide convenient access to both sides of the panel. The pairs of cable storage spools 430 and 440 and corresponding cable storage clips 435 and 445, as well as routing channels 515 and 532 through which cables transition between the front and rear of

panel 405, are positioned and designed to (1) maintain separation of cable storage between the feed cables (stored on spools 430 and clips 435) and the distribution cables 120 (stored on spools 440 and clips 445); (2) support the manufacturer's specified minimum bend radius for the cables; and (3) allow cables to be added after the initial installation without cross-over of cable types. The feeder cable breakout adapter storage area is located on the panel 405 nearest the hinge axis 406 and aligned with the hinge axis to allow easy transition of the drop cable 110 from the storage in the base 205 to the panel 405. The proximity and alignment to the hinge also allows the panel to be operated (open and closed) without excessive stress to the cable transition. The feeder breakout cable storage clips 435 are located in parallel to the breakout adapter storage 450 (see Fig. 4-1) to provide a convenient transition and to maintain minimum bend radius. The feeder break-out cables 550 are routed and stored on spools 430 and clips 435 as represented by arrows 512 shown in Fig. 5-3. As described above the fiber storage panel 405 also incorporates an integrated cable channel 515 that maintains cable radius while transitioning the feeder cables from the storage clips 435 on the back 415 of the panel to the connectors 465 on the front 410 of the panel. Arrow 516 represents the transition of cables 550 into channel 515.

[0030] Referring now more particularly to Fig. 5-3, shown is an integrated cable channel 530 in base 205. Integrated cable channel 530 is positioned parallel to the panel hinge 406 and located to the side edge of base 205 to allow the distribution cable 120 to be routed from the distribution cable entrance 535 to the top of the base and onto the panel 405 through opening 540 without cross-over of the other cable types. Arrow 531 represents the routing of distribution cables 120 from channel 530 onto panel 405. The location of the cable clips 445 and cable channel 532 on the back side 415 of the panel allows the distribution cable 120 to transition from the backside 415 of panel 405 to the front side 410 of panel 405 without causing unnecessary stress or bending during panel movement or operation. The distribution cable storage clips 445 are oriented to provide a convenient transition and to maintain minimum bend radius. Arrows 514 represent the routing and storage of distribution cables 120 on spools 440 and clips 445. The integrated channel 532 on fiber storage panel 405 transitions the distribution cables 120 from the storage clips 445 on the rear side 415 to the adapters or connectors on the front 410 of the pane while maintaining an acceptable cable radius. Arrow 518 represents the transition into channel 532.

[0031] Referring now to Fig. 5-4, DIB 100 is shown with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above.

[0032] Referring now to Fig. 6-1, shown is panel 405 folded into base unit 205 for storage such that front side 410 of the panel is shown. The adapters or termination connectors 465 discussed above are shown on the front 410 of the panel oriented with respect to the cable channels 515 and 532 to maintain the necessary minimum bend radius during cable installation. Arrows 610 represent the routing of feed cables 550 on the front of panel 405, while arrows 620 represent the routing of distribution cables 120 on the same side. Channels 515 and 532 provide the transitions for these respective cables between the front and rear sides of the panel. Cable routing clips 612 attached to, or formed integrally with, panel 405 are also used to secure cables 120 and 550 to front side 410 of the panel in proper positions to maintain the acceptable bend radius specified by the cable manufacturer.

[0033] Referring now to Fig. 6-2, shown is the pre-connectorized distribution cable entry point 535 for distribution cable 120 in both open (right) and closed (left) positions. This entry point 535 includes an integrated cable grommet cavity 650 with bend limiting flange 645. An integrated portion of the enclosure base 205 provides the flange 645 and forms a cavity 650 to retain and compress the cable grommet 660 to provide a seal between the grommet, base 205, and cables 120. An integrated hinge 665 and latching system 670 are also provided for the cable entry cover portion 675. The integrated radius flange 645 limits the cable bend when pulled in any direction.

[0034] In an exemplary embodiment, the hinged cable entry cover 675 also includes a bend limiting flange 677. The cover 675 is in some embodiments a rigid cover that hinges on the grommet cavity 650. Opening the cover allows the grommet 660 to be removed, and when closed the cover 675 retains and compresses the grommet to provide a seal between the cover, grommet, base, and cables.

[0035] An example embodiment of a weather resistant pre-connectorized cable grommet 660 is shown in Fig. 6-3. Grommet 660 is, in exemplary embodiments, made of a flexible material such as rubber that will compress and seal against the base, cover and cables. The grommet employs cable ports comprising of thin slices though the material from the perimeter of the grommet towards the center. Near the center, the thin slices form a partial circle. These partial circle slugs can be peeled out to create a cavity for the cable. The radial slices protruding to the perimeter of the grommet can be spread open and a cable inserted without having to thread the cable end through the grommet.

[0036] Referring now to Fig. 6-4, DIB 100 is shown in its folded position (with front 410 of panel 405 shown facing out as the panel is stored in the base) with drop cable 110, feed

cables 550 and distribution cables 120 routed and stored as described above, including the transition channels 515 and 532 as well as the cable adapters or connectors 465 positioned approximately at the center of panel 405.

[0037] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims. For example, in various embodiments, the DIB can be made from materials other than plastic. Further, the various components can be arranged in different ways than those specifically illustrated. Other examples of modifications of the disclosed concepts are also possible, without departing from the scope of the disclosed concepts.

WHAT IS CLAIMED IS:

1. A drop interface box (100) configured to be mounted to a structure and to receive a drop cable (110) from an optical fiber service provider distribution point and a plurality of distribution cables (120) which distribute the optical fiber service, the drop interface box comprising:

a base unit (205) having a drop cable entrance (206) configured to receive the drop cable (110) and having drop cable retaining mechanisms (420) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover (210) having a hinged connection (401) to the base unit to selectively enclose a storage area provided in the base unit; and

a fiber storage panel (405) moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools (430) positioned to store a plurality of feed break-out cables (550) coupleable to the drop cable, the fiber storage panel further having second spools (440) positioned to store a plurality of distribution cables (120) coupleable to the plurality of feed break-out cables.

2. The drop interface box of claim 1, wherein the fiber storage panel includes a hinged connection (406) to the base unit on a side opposite the hinged connection of the cover to the base unit.

3. The drop interface box of claim 1, wherein the fiber storage panel further includes an adapter bracket (460) configured to hold one or more adapters (465) which couple the plurality of feed break-out cables to the plurality of distribution cables.

4. The drop interface box of claim 3, wherein the adapter bracket is positioned on a first side (410) of the fiber storage panel, and the first spools and second spools are positioned on a second side (415) of the fiber storage panel.

5. The drop interface box of claim 4, and wherein the fiber storage panel further includes a first set of cable storage clips (435) positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips (445) positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

6. The drop interface box of claim 4, wherein the fiber storage panel further comprises a first routing channel (515) and a second routing channel (532), the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

7. The drop interface box of claim 6, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

8. The drop interface box of claim 6, wherein the base unit further comprises a cable channel (530) formed substantially parallel to the hinged connection of the fiber storage panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance (535) at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

9. The drop interface box of claim 8, wherein the distribution cable entrance includes a cable grommet cavity (650) and a bend limiting flange (645).

10. The drop interface box of claim 9, and further comprising a cable grommet (660) retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

11. The drop interface box of claim 1, wherein the drop cable retaining mechanisms (420) in the base unit comprise storage clips positioned on opposing sides of the base unit.

12. The drop interface box of claim 1, wherein the drop cable entrance further comprises slots (345) formed in the base unit and configured to receive a cable clip (340) which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit.

13. The drop interface box of claim 12, and further comprising a strain-relief clamp (320) coupled to the base unit proximate the drop cable entrance.
14. The drop interface box of claim 1, and further comprising a security mechanism (220 or 225) for securing the cover to the base unit in a closed position.

DROP INTERFACE BOX

ABSTRACT

Disclosed are exemplary embodiments of a drop interface box (DIB) (100) for interfacing between an optical network service provider's heavy jacketed drop cable (110) and optical distribution cables (120) at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel (405) includes spools (430; 440), cable clips (435; 445) and integrated cable channels (515; 532) that maintain cable radius during transitions of cables from a storage side or plane (415) of the panel to a connector side or plane (410) of the panel.

UNITED STATES RECEIVING OFFICE (RO/US)

Re	International Appln. No. PCT/---
Applicant	LARSSON, Nicholas B. et al.
International Filing Date	5 April 2012 (05.04.2012)
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX
Agent's File	C64.12-0053

**PRELIMINARY AMENDMENT AND
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OCTOBER 4, 2013.

Signature /John D. Veldhuis-Kroeze/.

Printed Name JOHN D. VELDHUIS-KROEZE.

Sir:

Prior to calculation of the filing fee for this application, please enter the following Preliminary Amendment:

If any amendments have been filed under Articles 19 or 34 of the Patent Cooperation Treaty, Applicant requests that these amendments not be entered as a part of this national filing.

AMENDMENT TO THE SPECIFICATION

Please change the title to the following to comply with changes made by the PCT Office:

OPTICAL FIBER CABLE DROP INTERFACE BOX

Please insert the following paragraph at page 1, between the title of the invention and the first line of the text:

CROSS-REFERENCE TO RELATED APPLICATION

This Application is a Section 371 National Stage Application of International Application No. PCT/ US2012/032320, filed April 5, 2012 and published as WO 2012/138856 on October 11, 2012, in English, the contents of which are hereby incorporated by reference in their entirety.

AMENDMENT TO THE CLAIMS

1. (currently amended) A drop interface box ~~(100)~~ configured to be mounted to a structure and to receive a drop cable ~~(110)~~ from an optical fiber service provider distribution point and a plurality of distribution cables ~~(120)~~ which distribute the optical fiber service, the drop interface box comprising:

a base unit ~~(205)~~ having a drop cable entrance ~~(206)~~ configured to receive the drop cable ~~(110)~~ and having drop cable retaining mechanisms ~~(420)~~ spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover ~~(210)~~ having a hinged connection ~~(401)~~ to the base unit to selectively enclose a storage area provided in the base unit; and

a fiber storage panel ~~(405)~~ moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools ~~(430)~~ positioned to store a plurality of feed break-out cables ~~(550)~~ coupleable to the drop cable, the fiber storage panel further having second spools ~~(440)~~ positioned to store a plurality of distribution cables ~~(120)~~ coupleable to the plurality of feed break-out cables.

2. (currently amended) The drop interface box of claim 1, wherein the fiber storage panel includes a hinged connection ~~(406)~~ to the base unit on a side opposite the hinged connection of the cover to the base unit.

3. (currently amended) The drop interface box of claim 1, wherein the fiber storage panel further includes an adapter bracket ~~(460)~~ configured to hold one or more adapters ~~(465)~~ which couple the plurality of feed break-out cables to the plurality of distribution cables.

4. (currently amended) The drop interface box of claim 3, wherein the adapter bracket is positioned on a first side ~~(410)~~ of the fiber storage panel, and the first spools and second spools are positioned on a second side ~~(415)~~ of the fiber storage panel.

5. (currently amended) The drop interface box of claim 4, and wherein the fiber storage panel further includes a first set of cable storage clips ~~(435)~~ positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips ~~(445)~~ positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

6. (currently amended) The drop interface box of claim 4, wherein the fiber storage panel further comprises a first routing channel ~~(515)~~ and a second routing channel ~~(532)~~, the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

7. (original) The drop interface box of claim 6, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

8. (currently amended) The drop interface box of claim 6, wherein the base unit further comprises a cable channel ~~(530)~~ formed substantially parallel to the hinged connection of the fiber storage

panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance ~~(535)~~ at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

9. (currently amended) The drop interface box of claim 8, wherein the distribution cable entrance includes a cable grommet cavity ~~(650)~~ and a bend limiting flange ~~(645)~~.

10. (currently amended) The drop interface box of claim 9, and further comprising a cable grommet ~~(660)~~ retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

11. (currently amended) The drop interface box of claim 1, wherein the drop cable retaining mechanisms ~~(420)~~ in the base unit comprise storage clips positioned on opposing sides of the base unit.

12. (currently amended) The drop interface box of claim 1, wherein the drop cable entrance further comprises slots ~~(345)~~ formed in the base unit and configured to receive a cable clip ~~(340)~~ which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit.

13. (currently amended) The drop interface box of claim 12, and further comprising a strain-relief clamp ~~(320)~~ coupled to the base unit proximate the drop cable entrance.

14. (currently amended) The drop interface box of claim 1, and further comprising a security mechanism ~~(220 or 225)~~ for securing the cover to the base unit in a closed position.

IN THE ABSTRACT

Disclosed are exemplary embodiments of a drop interface box (DIB) ~~(100)~~ for interfacing between an optical network service provider's heavy jacketed drop cable ~~(110)~~ and optical distribution cables ~~(120)~~ at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel ~~(405)~~ includes spools ~~(430;~~ ~~440)~~, cable clips ~~(435;~~ ~~445)~~ and integrated cable channels ~~(515;~~ ~~532)~~ that maintain cable radius during transitions of cables from a storage side or plane ~~(415)~~ of the panel to a connector side or plane ~~(410)~~ of the panel.

REMARKS

I. SPECIFICATION AMENDMENTS

This Preliminary Amendment includes amendments made to place the Specification in a format more consistent with U.S. practice. No amendments are made in view of the prior art.

II. CLAIM AMENDMENTS

This Preliminary Amendment includes amendments made to place the claims in a format more consistent with U.S. practice. No amendments are made in view of the prior art.

III. ABSTRACT AMENDMENTS

This Preliminary Amendment includes amendments made for conformance with U.S. practice. No new matter has been added.

Applicants respectfully request entry of this Preliminary Amendment prior to the first Official Action and prior to calculating the fees for the application.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KOEHLER, P.A.

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JVK/trs

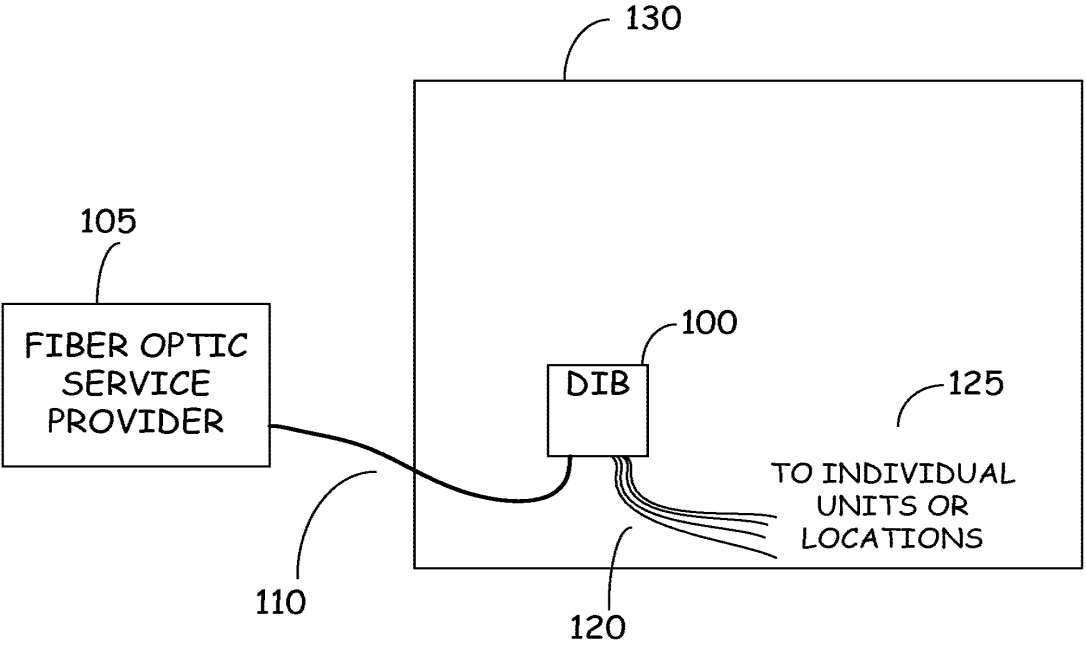


Fig. 1

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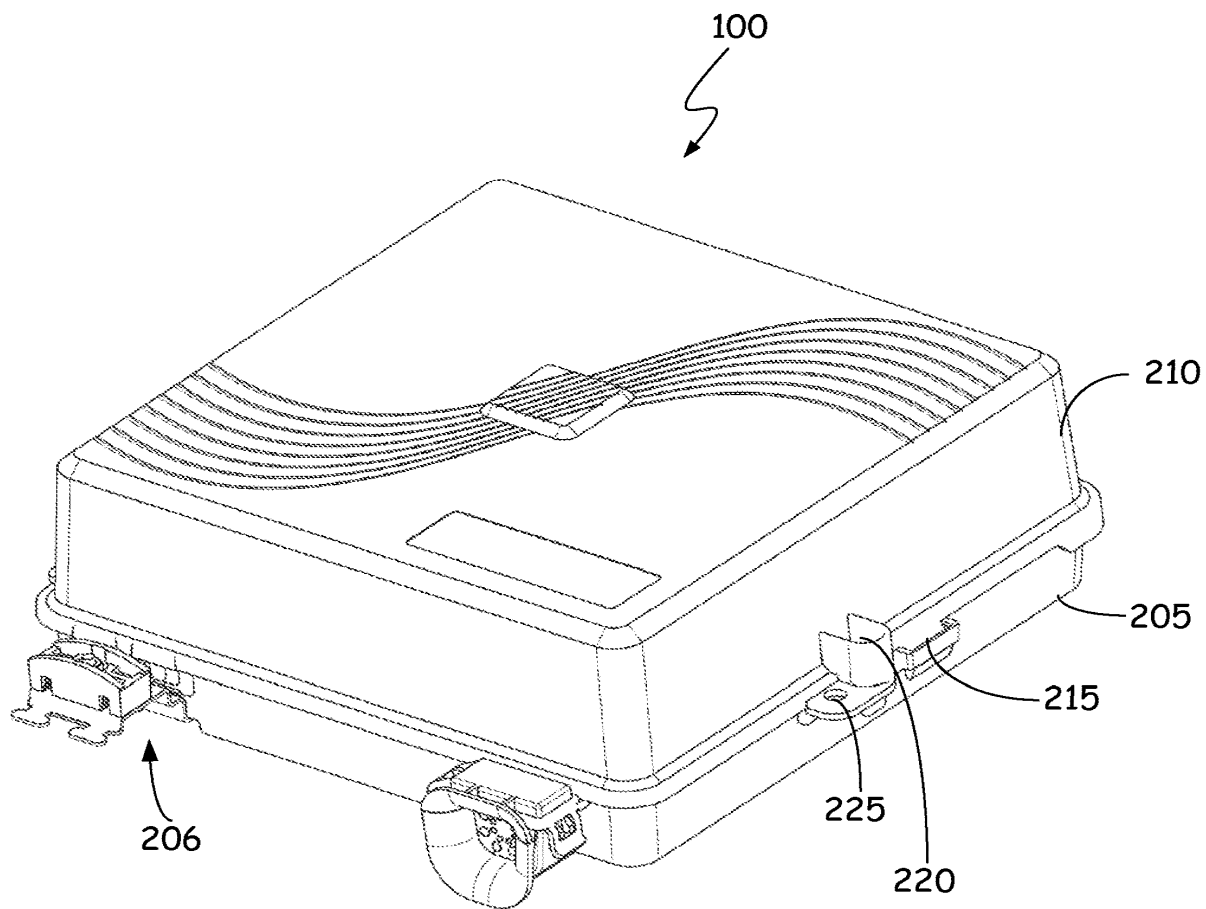


Fig. 2-1

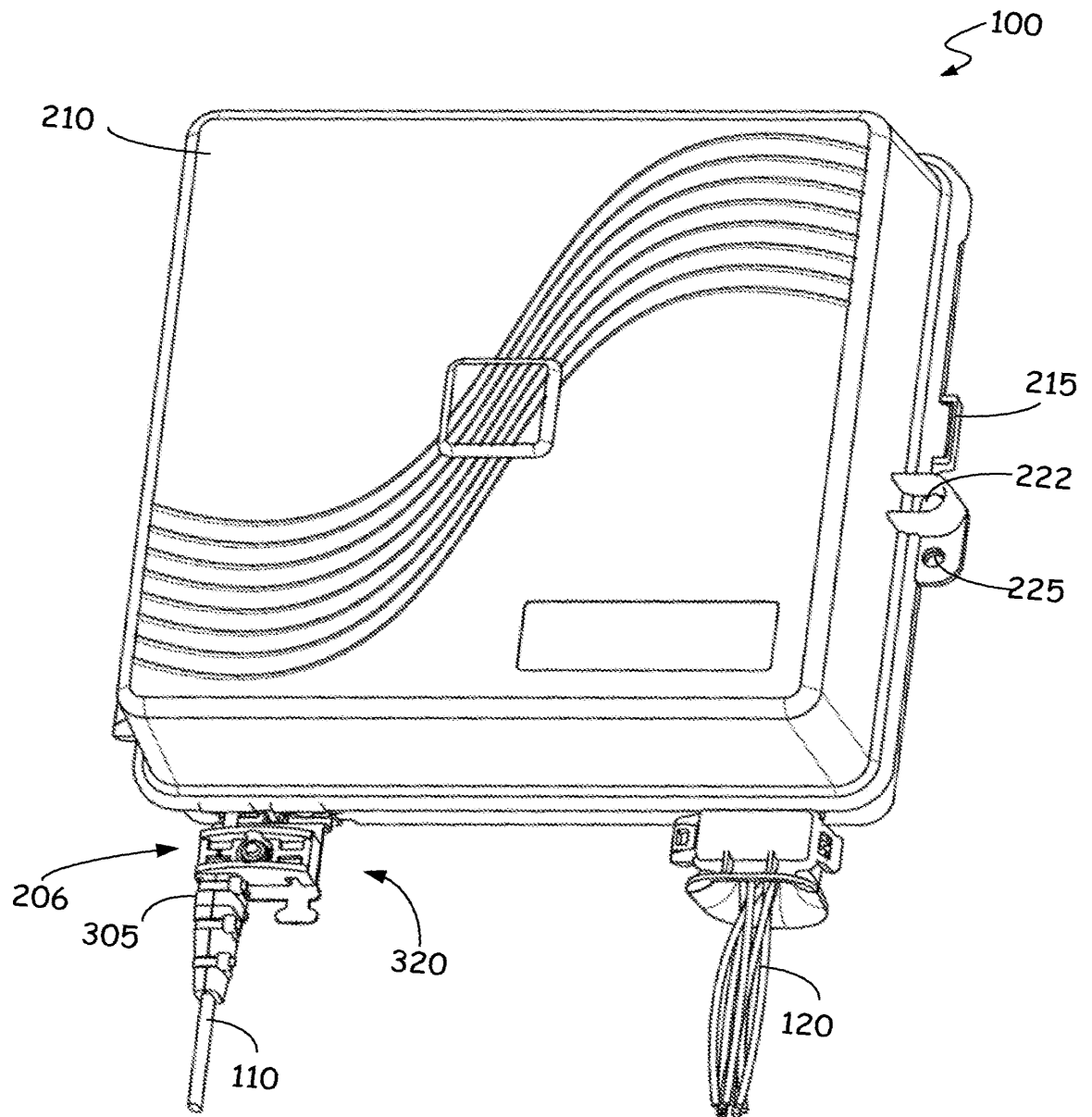


Fig. 2-2

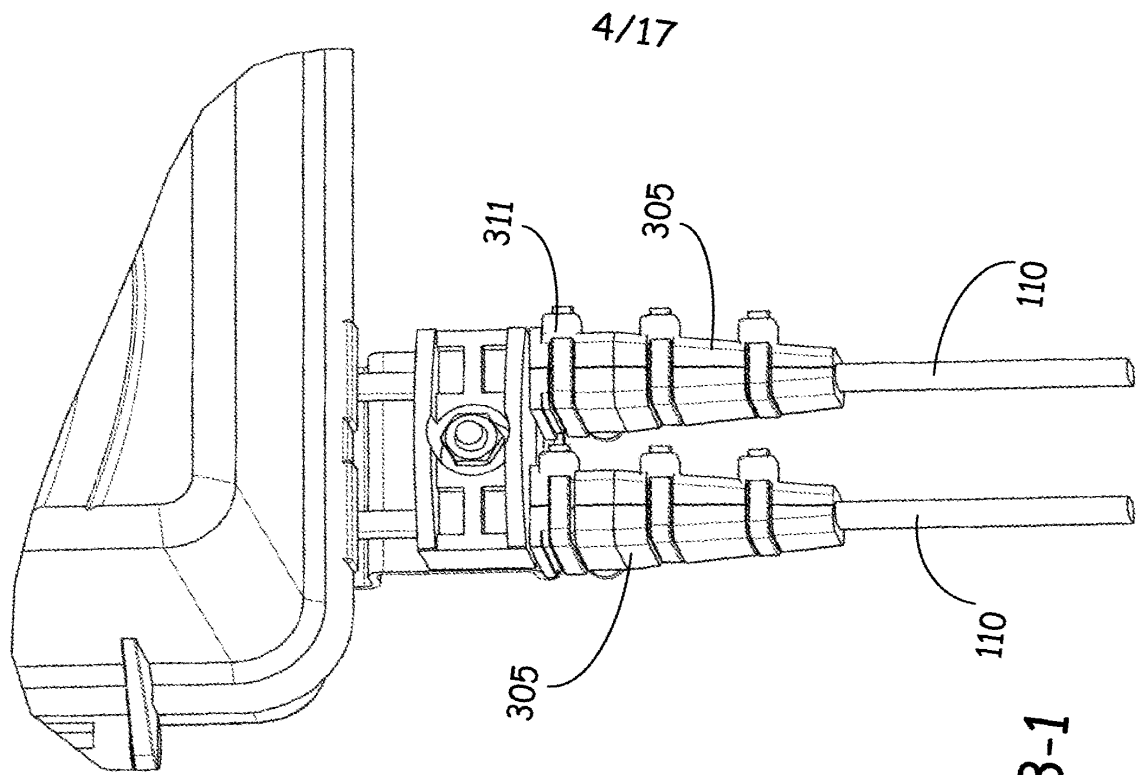
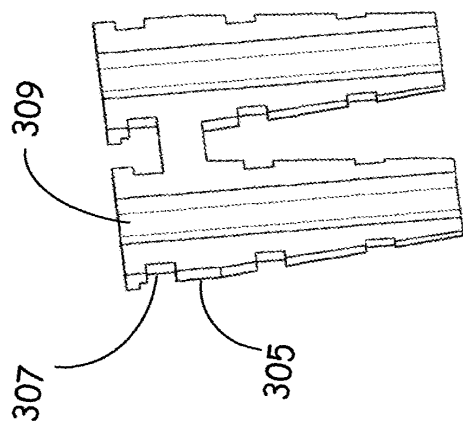


Fig. 3-1



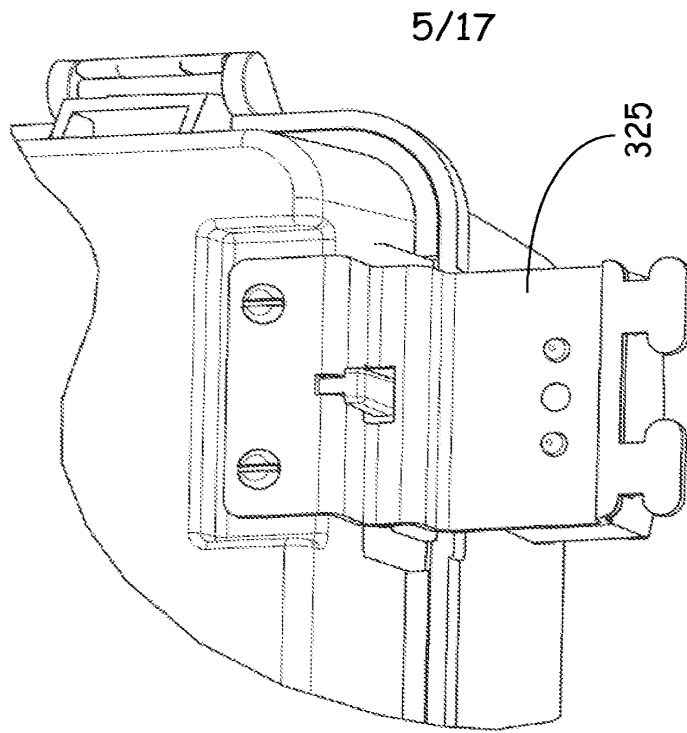
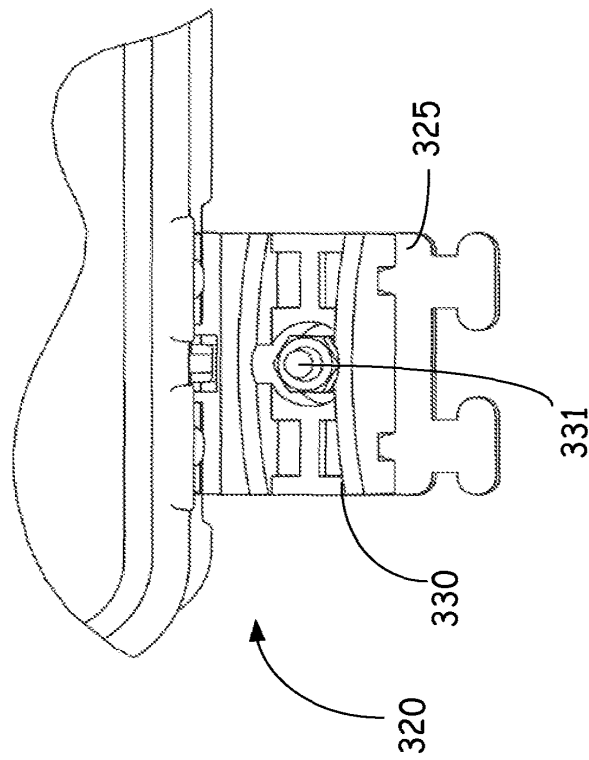


Fig. 3-2

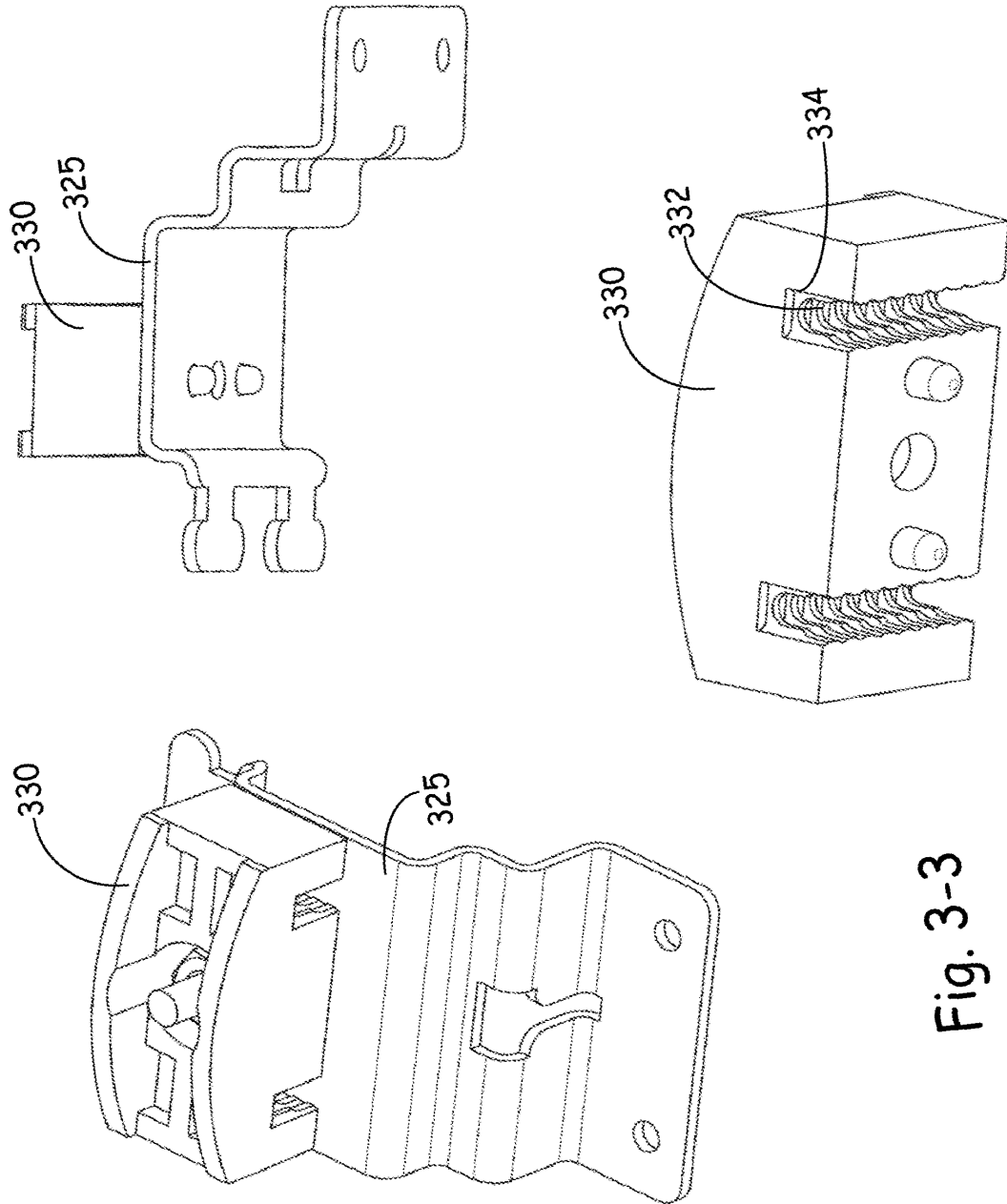


Fig. 3-3

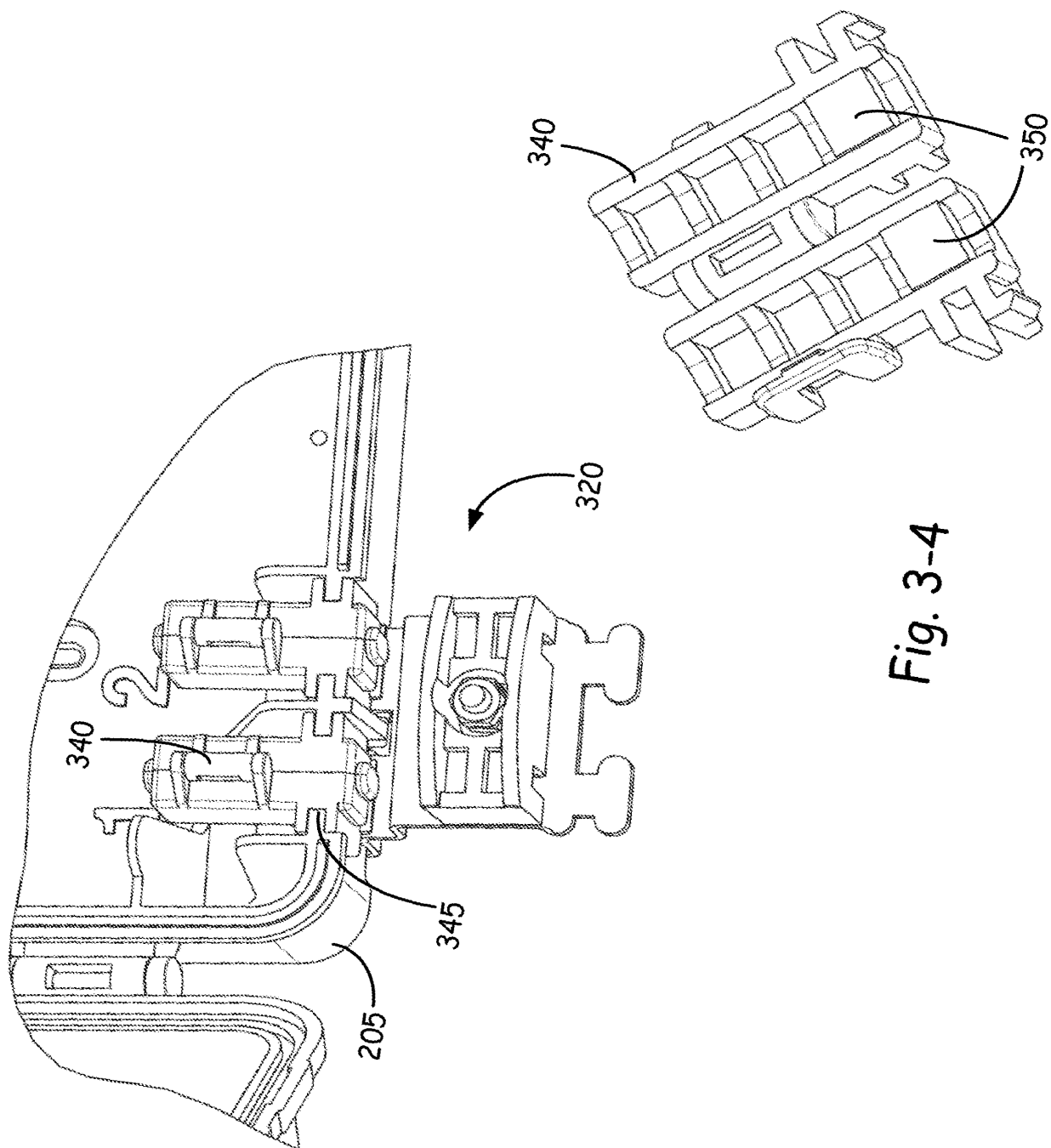


Fig. 3-4

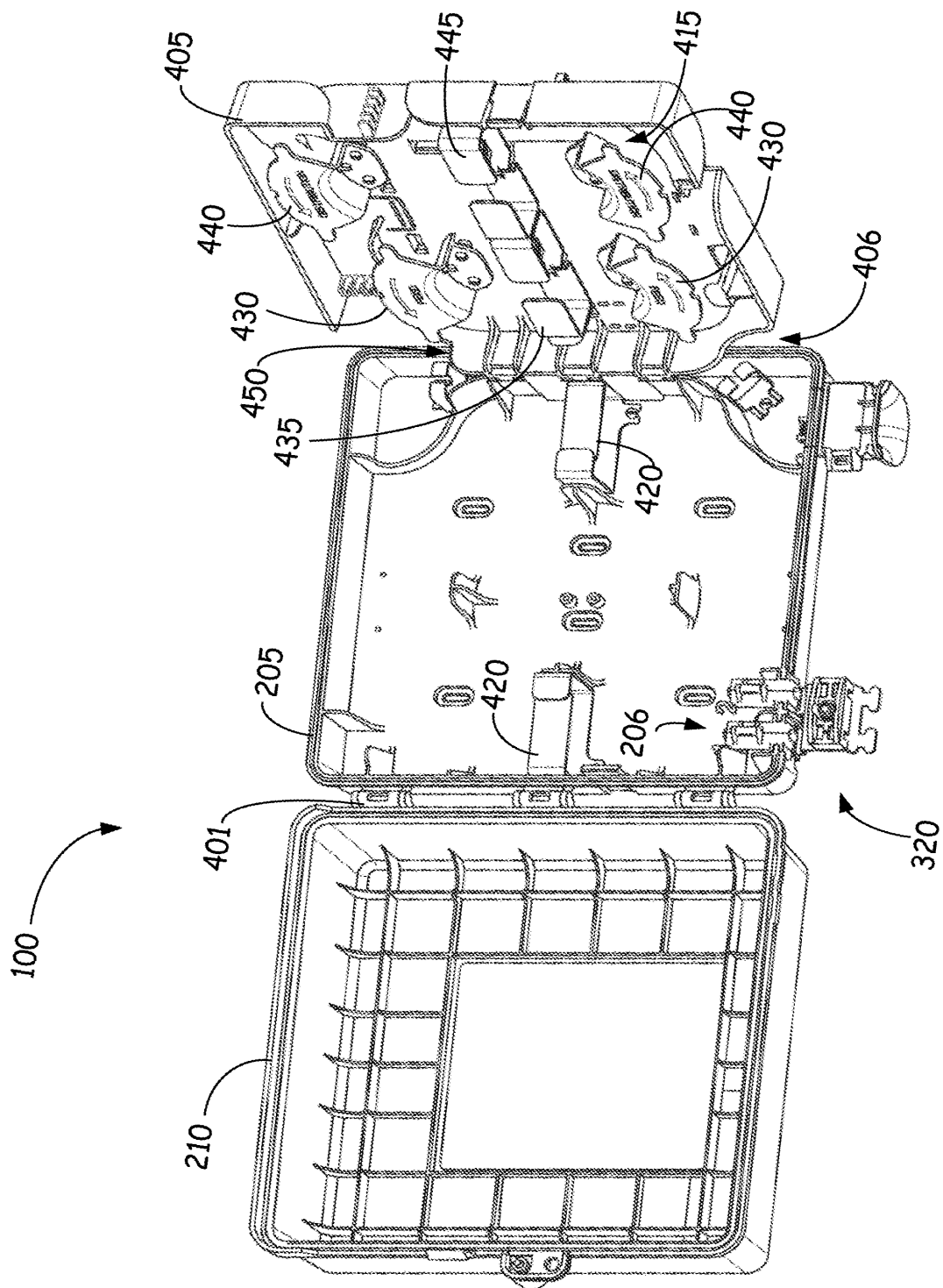


Fig. 4-1

9/17

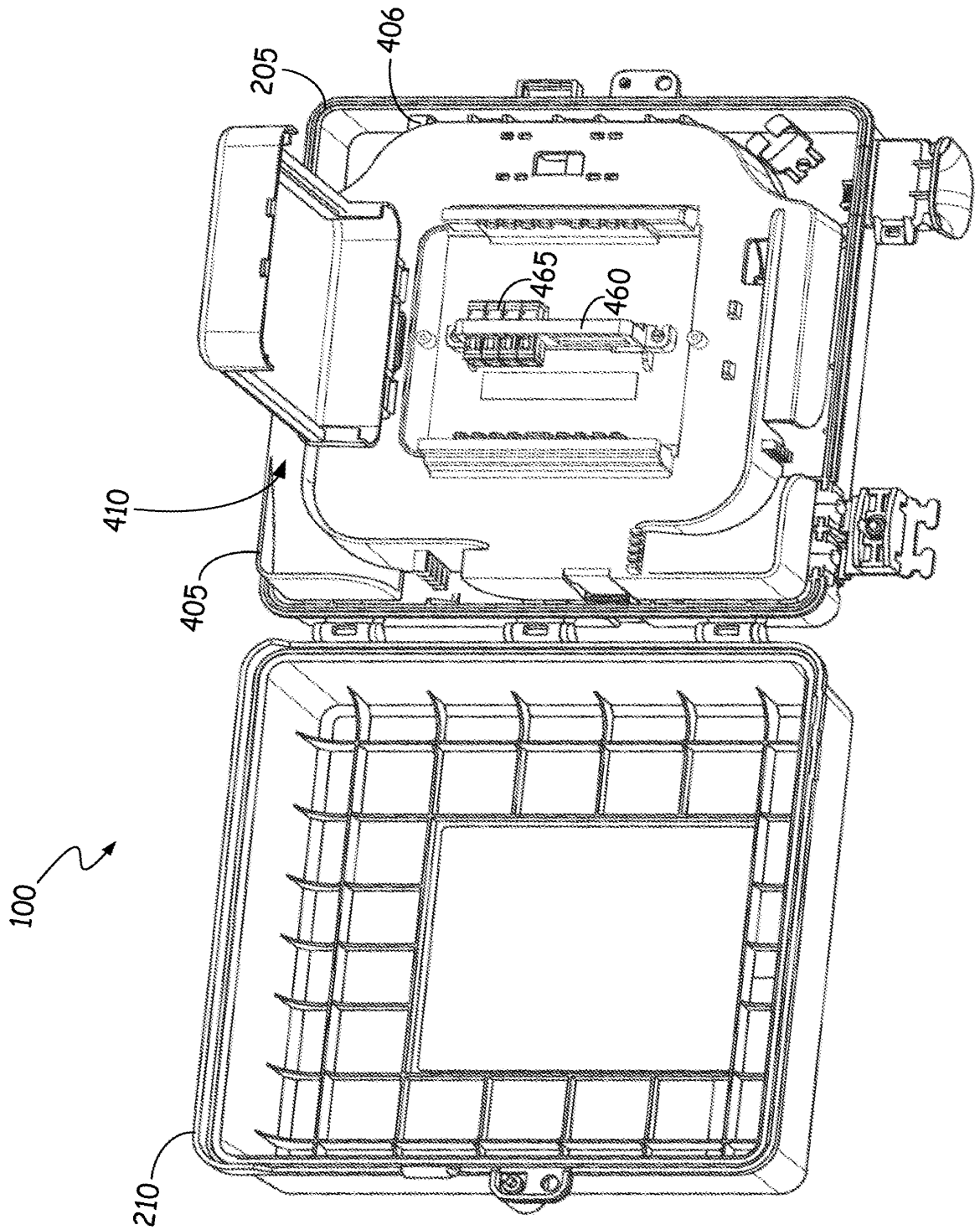


Fig. 4-2

10/17

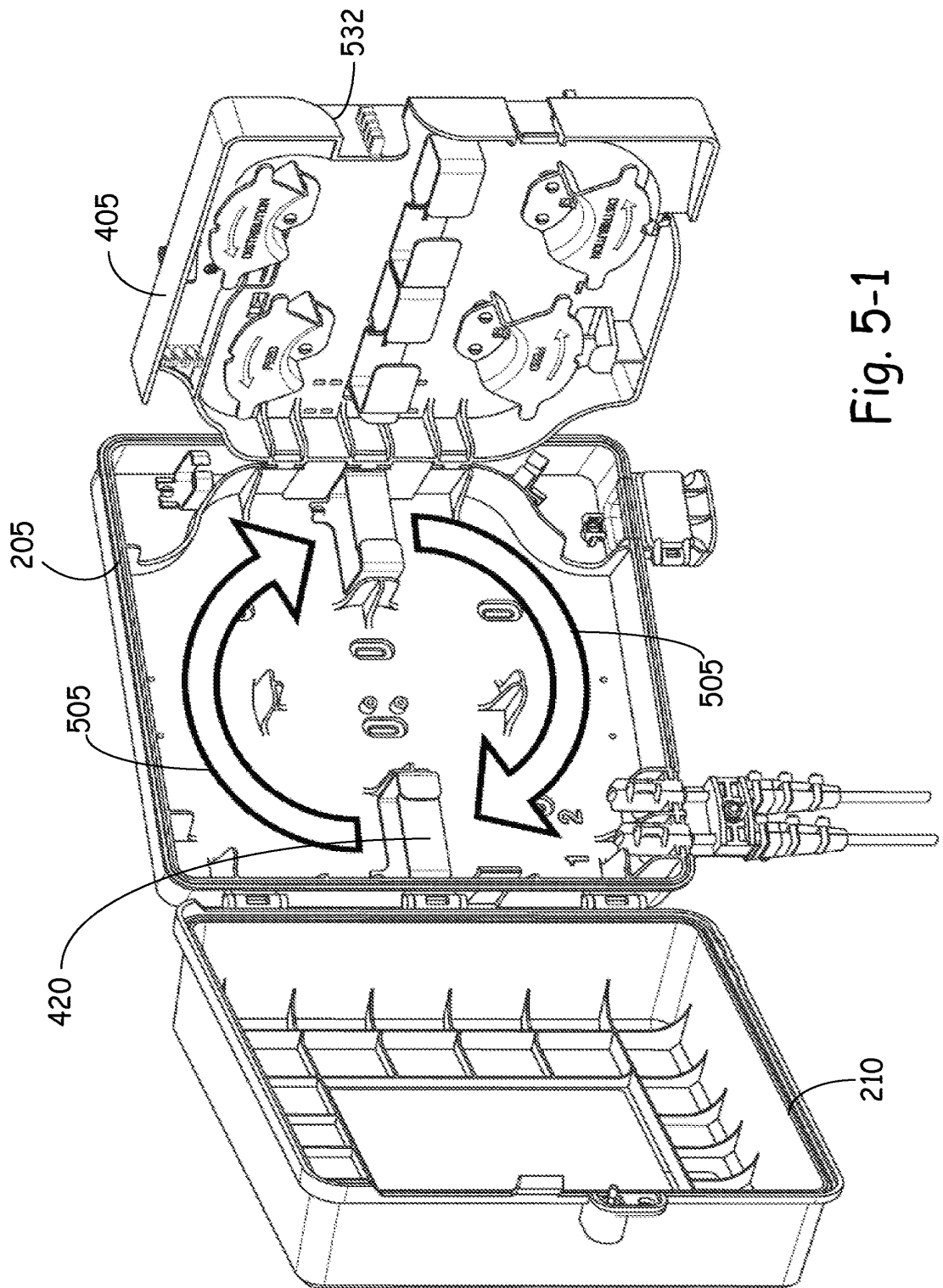


Fig. 5-1

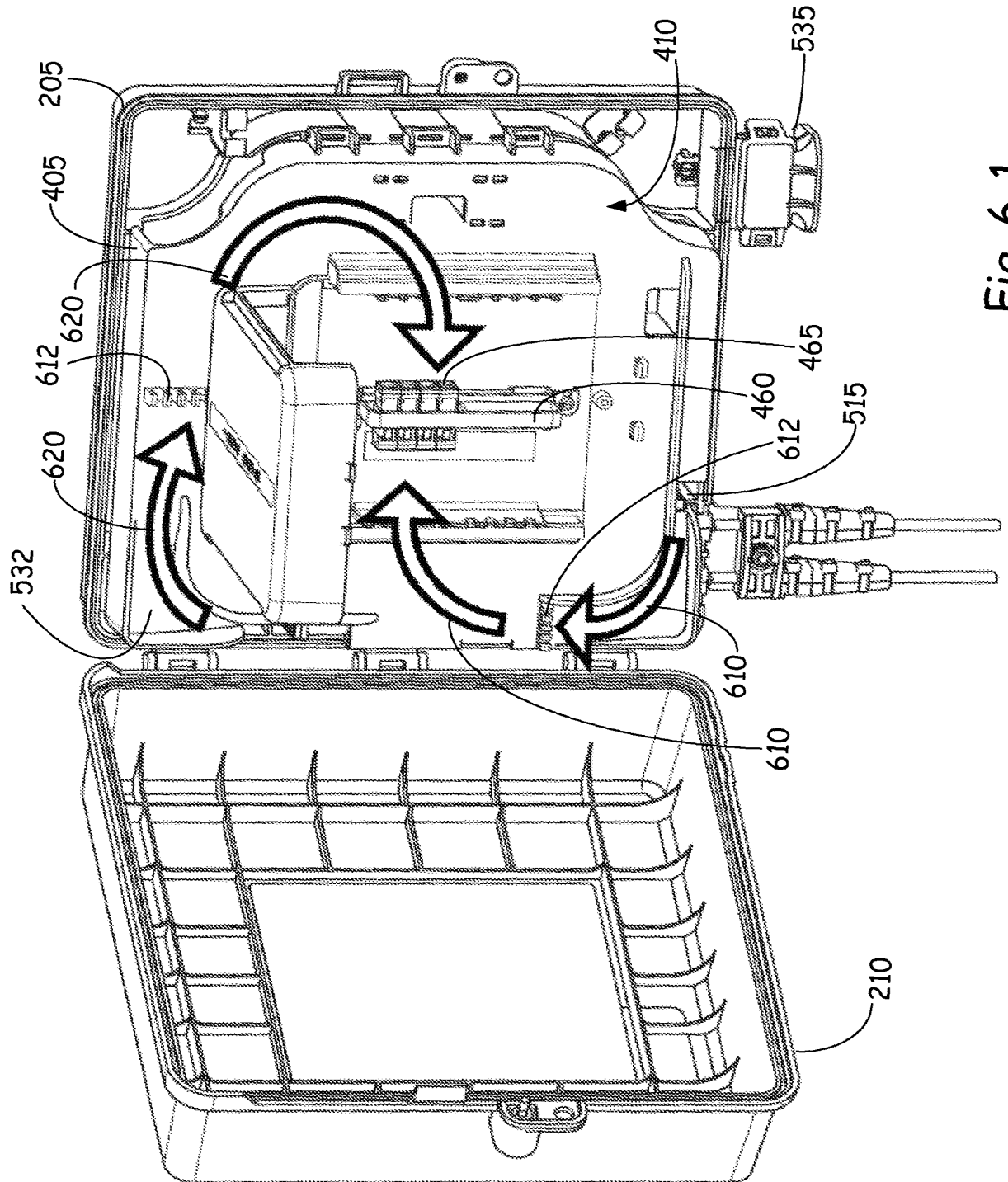


Fig. 6-1

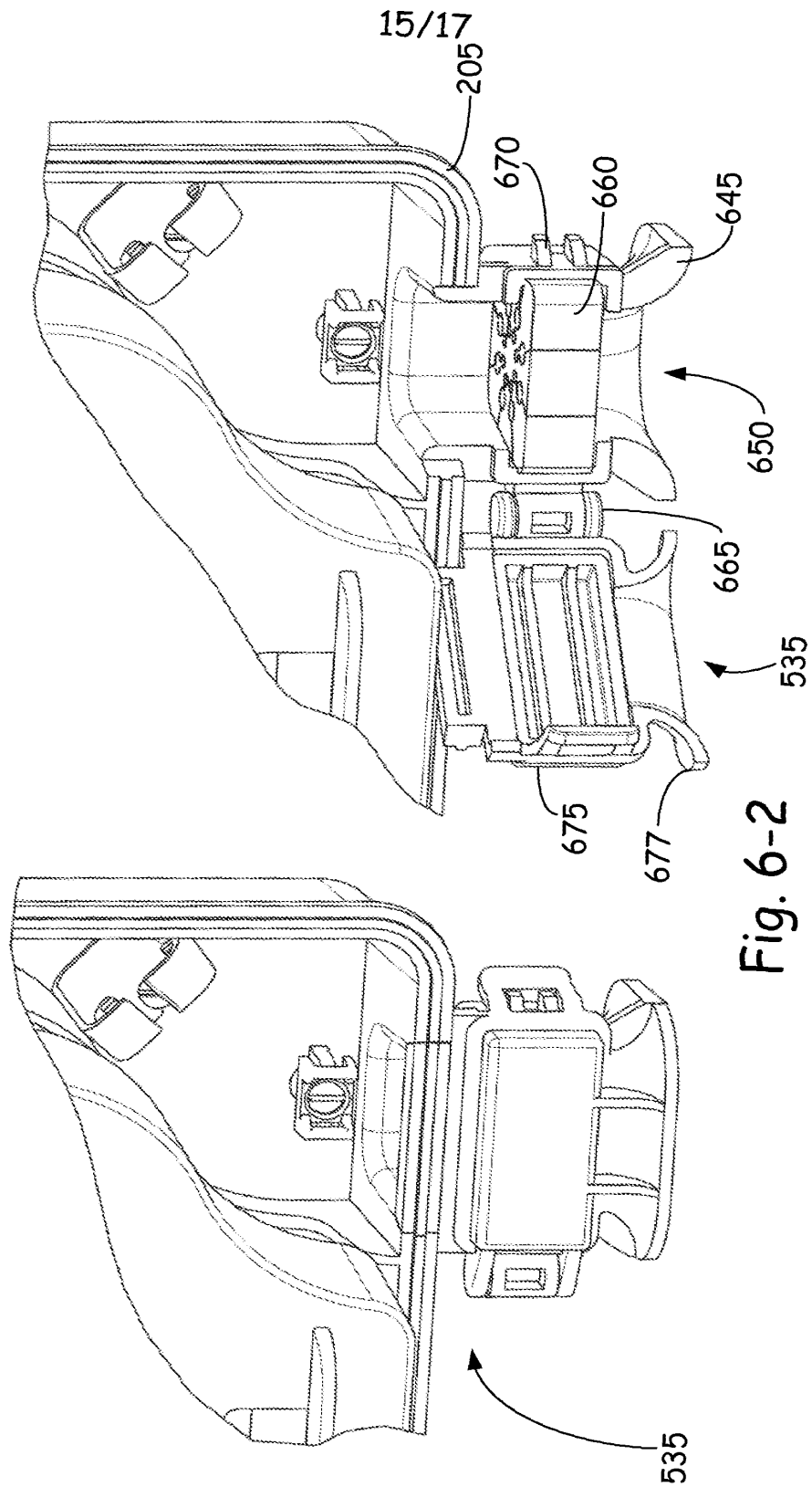
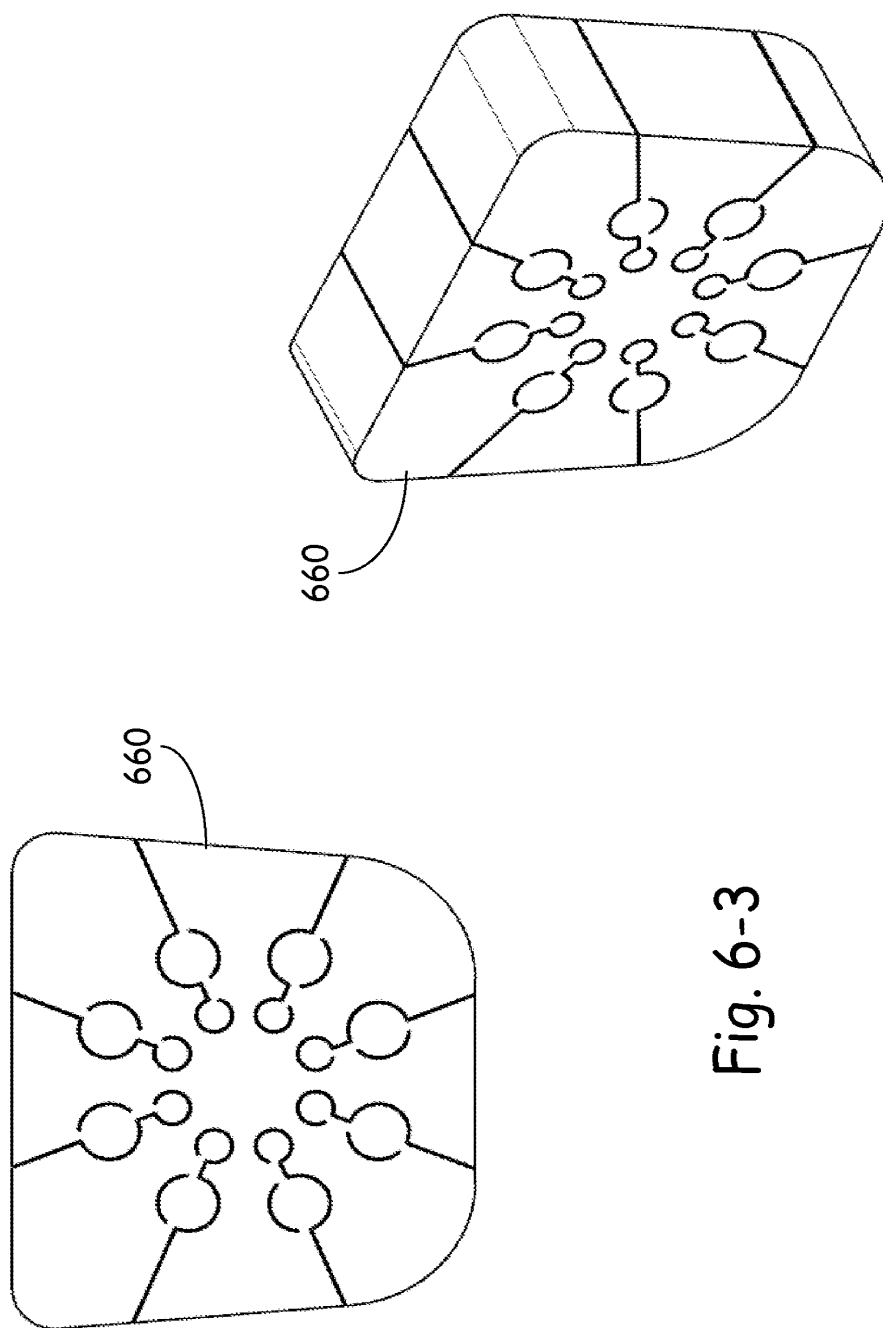


Fig. 6-2



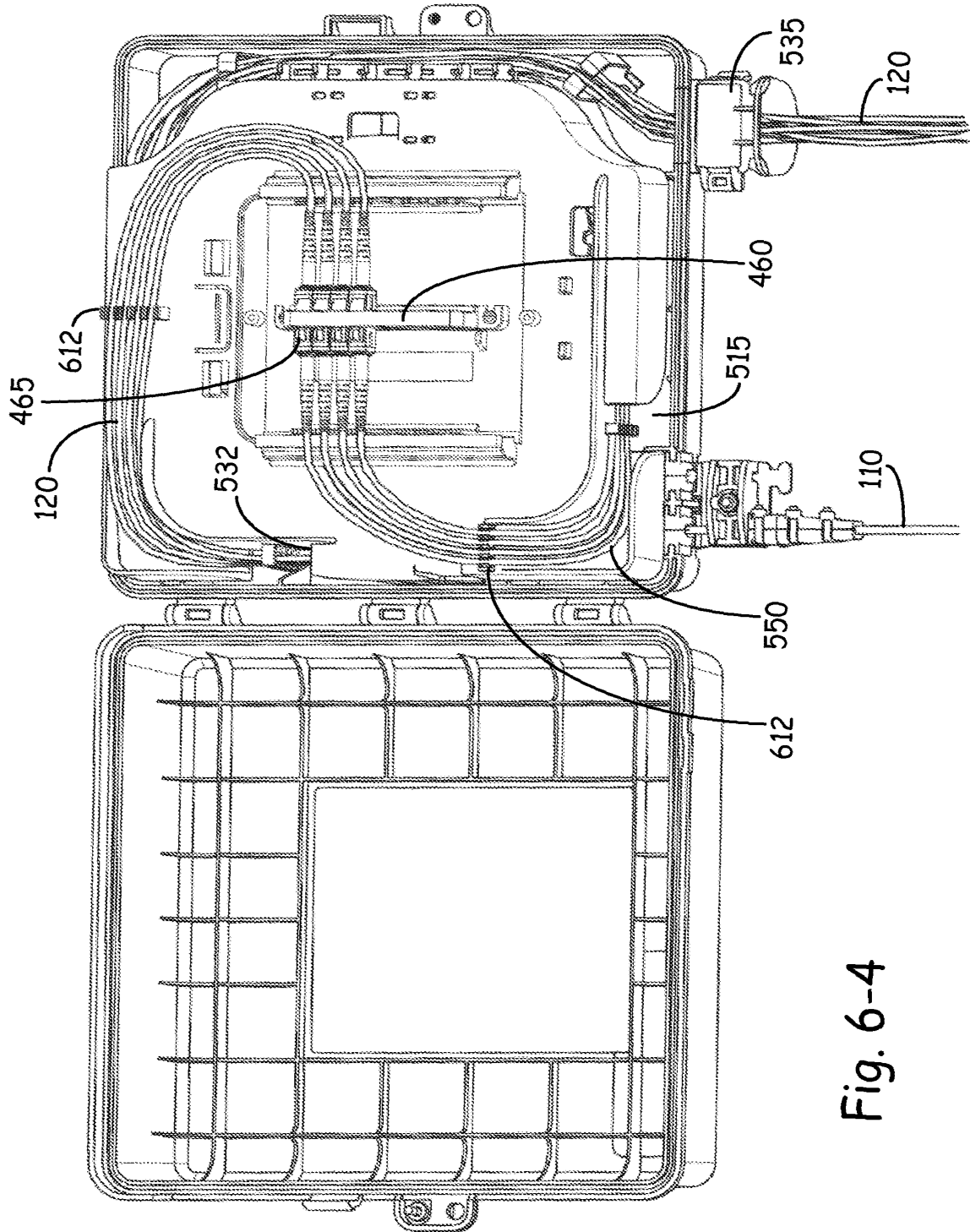


Fig. 6-4

DECLARATION
FOR UTILITY OR DESIGN APPLICATION

Attorney Docket No.
C64.12-0053

SPECIFICATION AND INVENTORSHIP IDENTIFICATION

This declaration is directed to the subject matter which is claimed in the application entitled DROP INTERFACE BOX the specification of which having the above title and/or attorney docket number C64.12-0053

X is attached hereto, or as previously filed with the USPTO,
_____ was filed on _____ as Appln. No. _____,
_____ was amended on _____, and/or
X was described and claimed in PCT International Application No. PCT/US12/32320 filed on 5 April 2012 and as amended with any Preliminary Amendment filed with National Stage entry.

AUTHORIZATION TO PERMIT ACCESS TO APPLICATION BY PARTICIPATING OFFICE

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified patent application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

DECLARATION
FOR UTILITY OR DESIGN APPLICATION

Attorney Docket No.
C64,12-0053

STATEMENTS

I have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part.

If the above-identified application is to be or was filed on or after September 16, 2012:

I declare that the above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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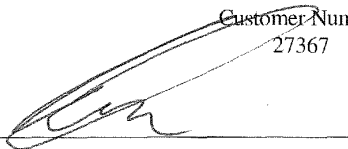
I declare that all statements made herein that are of my own knowledge are true and that all statements that are made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by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

DESIGNATION OF CORRESPONDENCE ADDRESS

Please address all correspondence and telephone calls to **John D. Veldhuis-Kroeze** in care of:

Customer Number
27367

Signature of Inventor :



Date :

10-2-13

Legal Name of Inventor : Nicholas B. Larsson

(Printed Name)

Residence : Blomkest, Minnesota

Citizenship: U.S.A.

P.O. Address : 219 Schendel Street, PO Box 152, Blomkest, Minnesota 56216

DECLARATION
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Attorney Docket No.
C64.12-0053

Signature of Inventor : _____ Date : _____

Legal Name of Inventor : Andrew E. Swienton
(Printed Name)

Residence : Plymouth, Minnesota Citizenship: U.S.A.

P.O. Address : 4570 Ranier Court North, Plymouth, Minnesota 55446

Signature of Inventor : _____ Date : _____

Legal Name of Inventor : George I. Wakileh
(Printed Name)

Residence : Batavia, Illinois Citizenship: U.S.A.

P.O. Address : 440 Judd Lane, Batavia, Illinois 60510

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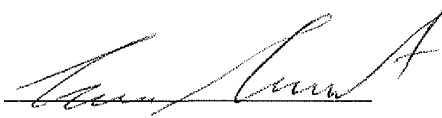
Legal Name of Inventor : Nicholas B. Larsson
(Printed Name)

Residence : Blomkest, Minnesota Citizenship: U.S.A.

P.O. Address : 219 Schendel Street, PO Box 152, Blomkest, Minnesota 56216

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Signature of Inventor :  Date : 10.2.13
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(Printed Name)
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P.O. Address : 4570 Ranier Court North, Plymouth, Minnesota 55446

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(Printed Name)
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Legal Name of Inventor : Nicholas B. Larsson
(Printed Name)

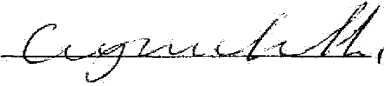
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P.O. Address : 219 Schendel Street, PO Box 152, Blomkest, Minnesota 56216

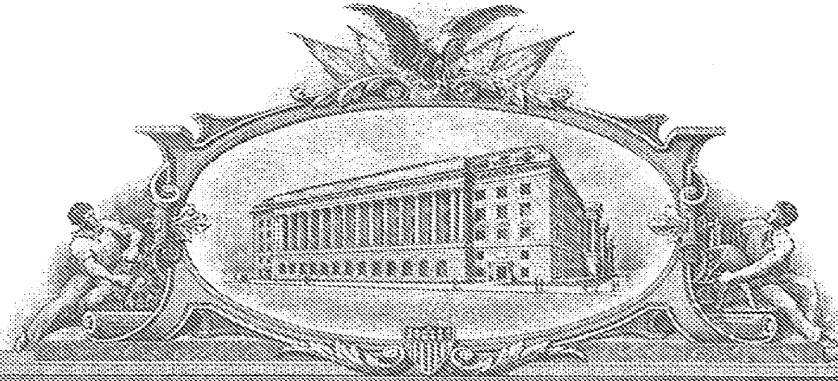
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Legal Name of Inventor : Andrew E. Swienton
(Printed Name)
Residence : Plymouth, Minnesota Citizenship: U.S.A.
P.O. Address : 4570 Ranier Court North, Plymouth, Minnesota 55446

Signature of Inventor :  Date : 10/04/2013
Legal Name of Inventor : George I. Wakilch
(Printed Name)
Residence : Batavia, Illinois Citizenship: U.S.A.
P.O. Address : 440 Judd Lane, Batavia, Illinois 60510

450201



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

April 13, 2012

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 61/472,008

FILING DATE: *April 05, 2011*

RELATED PCT APPLICATION NUMBER: PCT/US12/32320

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US61/472,008



Certified by

David J. Kappas

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	Drop Interface Box		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Nicholas	B.	Larsson		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Blomkest	State/Province	MN	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		219 Schendel Street			
Address 2		PO Box 152			
City	Blomkest	State/Province	MN		
Postal Code	56216	Country i	US		
Applicant 2					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Andrew	E.	Swinton		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Plymouth	State/Province	MN	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		4570 Ranier Court North			
Address 2					
City	Plymouth	State/Province	MN		
Postal Code	55446	Country i	US		
Applicant 3					Remove
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	George	I.	Wakileh		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	Drop Interface Box		

Citizenship under 37 CFR 1.41(b) i		US	
Mailing Address of Applicant:			
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City	Batavia	State/Province	IL
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Application Information:

Title of the Invention	Drop Interface Box		
Attorney Docket Number	C64.12-0053	Small Entity Status Claimed	☒
Application Type	Provisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	17	Suggested Figure for Publication (if any)	

Publication Information:

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	Drop Interface Box		
Customer Number	27367		

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Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
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This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

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Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
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Assignee 1				Remove
If the Assignee is an Organization check here. ☒				
Organization Name	Communication Systems, Inc.			
Mailing Address Information:				
Address 1	1001 East Highway 212			
Address 2				
City	Hector	State/Province	MN	
Country ⁱ	US	Postal Code	55342	
Phone Number		Fax Number		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053		
		Application Number			
Title of Invention	Drop Interface Box				
Signature	/John D. Veldhuis-Kroeze/		Date (YYYY-MM-DD)	2011-04-05	
First Name	John	Last Name	Veldhuis-Kroeze	Registration Number	38354

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DROP INTERFACE BOX

BACKGROUND

[0001] Disclosed embodiments relate to connection of an optical fiber feed or “drop” cable from an optical fiber service provider to a distribution point at a residence, dwelling or other building, such as a multi-unit dwelling. More particularly, disclosed embodiments relate to an enclosure for distribution of a passive optical fiber network. The enclosure will generally be mounted on a multi-dwelling residence, but can be mounted anywhere such distribution of a passive optical fiber network is desired to provide vertical, horizontal with one or multiple buildings in addition to providing building to building distribution using a variety of splice or termination options like ribbon splice or terminations.

[0002] Optical fiber is used in different delivery topologies to provide network access, for example internet access, to homes, businesses and other premises. Fiber to the x (FTTx) is a collective term for various optical fiber delivery topologies that are categorized according to where the fiber terminates. Optical fiber has commonly been used for long-distance parts of the network, but other communications media such as metal cabling has frequently been used in delivery to the customer premises. However, increasingly, optical fiber is being used to provide network access all of the way to the customer premises, and even within the customer premises.

[0003] Typically, a feed or drop optical fiber cable is provided to a premises, by an optical fiber service provider, from a larger distribution point or connection (e.g., a pole mounted distribution point). The feed is typically a heavy jacketed or hardened multi-fiber cable that is broken out at the premises into individual fiber connections. This is for example commonly the case at multi-dwelling residential buildings or at buildings that house multiple different businesses. Individual distribution fiber cables from inside each living or workplace unit are connected with adapters to the individual feed fiber optical cable connections from the multi-fiber drop cable.

[0004] Increasingly, optical fiber cables are pre-connectorized—that is they are shipped from a factory with terminating connectors already installed. This can lead to the need for installers to deal with excess optical fiber cable length in many instances. Other factors can also result in excess cable length. Storage of the excess cable length can be problematic, as can organization of the drop optical fiber cable, the multiple individual feed optical fiber cables, and the multiple

individual distribution optical fiber cables which are connected to the individual living or workplace units. The fact that the various optical fiber cables are pre-connectorized provides other challenges when attempting to store or organize the cables. Also, there is a need to protect the optical fiber cables from excessive strain, as well as from damage due to bending the cables at too small of a bend radius.

[0005] The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter.

SUMMARY

[0006] Disclosed are exemplary embodiments of a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel includes spools, cable clips and integrated cable channels that maintain cable radius during transitions of cables from a storage side or plane of the panel to a connector side or plane of the panel.

[0007] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a diagrammatic illustration of the use of a drop interface box (DIB) in accordance with disclosed embodiments.

[0009] Fig. 2-1 and 2-2 are perspective views of the DIB illustrated in Fig. 1.

[0010] Figs. 3-1 through 3-4 are illustrations of features of exemplary DIB embodiments which provide weather resistant seals, minimize strain on fiber cables, and prevent cable damage due to bending.

[0011] Figs. 4-1 and 4-2 are views of a base, cover and hinged fiber storage panel of a DIB in accordance with exemplary embodiments.

[0012] Figs. 5-1 through 5-3 are diagrammatic illustrations of drop, feed and distribution cable routing and storage in exemplary DIB embodiments.

[0013] Fig. 5-4 is a view of an exemplary DIB showing drop, feed and distribution cable routed and stored as shown in Figs. 5-1 through 5-3.

[0014] Fig. 6-1 is a diagrammatic illustration of feed and distribution cable routing to a front side of the fiber storage panel in accordance with exemplary embodiments.

[0015] Figs. 6-2 and 6-3 are diagrammatic illustrations of distribution cable entrance features which provide weather resistant sealing and prevent cable damage due to bending.

[0016] Fig. 6-4 is a view of an exemplary DIB showing feed and distribution cable routing to the front side of the fiber storage panel in accordance with exemplary embodiments as shown in Fig. 6-1.

DETAILED DESCRIPTION

[0017] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.

[0018] Disclosed embodiments include a drop interface box (DIB) which provides an easy to use and reliable solution to FTTx deployments using factory terminated optical cable assemblies. The disclosed DIB includes integrated slack storage compartments which provide ample room to store excess cable length while maintaining separation of hardened drop, feeder breakout, and distribution cables. This unique slack storage design allows for drop and distribution cables to be

added quickly and easily as demand increases. Use of the disclosed DIB is not limited to use with these pre-connectorized optical cables

[0019] Referring now to Fig. 1, shown is a diagrammatic illustration of the use of DIB 100 in accordance with exemplary embodiments. DIB 100 mounts at a desired location of a premises 130, which will typically be a multi-dwelling or multi-business type of premises in which multiple individual living spaces or units are included in a single larger building. However, DIB 100 is not limited to use in this type of premises. DIB 100 is configured to receive and partially house a hardened “drop” cable 110 from an optical fiber service provider distribution point 105, which can be, for example, a pole mounted box connected to the provider’s network. Inside of DIB 100, drop cable 110 is split into feeder breakout cables 550 (shown in Fig. 5-4) and converted into multiple distribution cables 120 which are connected in or to the individual units or locations 125 of premises 130. DIB 100 has numerous features, described below in detail, which aid in the organization and storage of the various cables, including pre-connectorized cables.

[0020] Referring now to Figs. 2-1 and 2-2, shown are side and front perspective views of DIB 100 in accordance with an exemplary embodiment. As shown in these Figs., DIB 100 includes a base unit 205 and a door or cover 210 which has a hinged connection to the base unit. A push to close cover latch 215 secures cover 210 to base unit 205 in a closed position, and a security screw housing 220 is formed with or in cover 210 and is configured to receive a security screw 222 for denying entry into DIB 100 to persons without a proper tool. For instance, in an exemplary embodiment, security screw 222 is a 3/8 inch security screw which is configured to be used with a “216 tool” of the type which is well known in the art. For further security, a padlock hasp 225 is also included in an exemplary embodiment for receiving a padlock (not shown) to lock cover 210 to base unit 205 in a closed position. In one exemplary embodiment, padlock hasp 225 can be integrally formed with the material of cover 210 and base unit 205. For example, in an exemplary embodiment cover 210, base unit 205 and the above-described components (not including security screw 222) are formed of a plastic material. In other embodiments, hasp 225 and/or other components are formed of other materials (e.g., metals) which are attached to cover 210 and/or base unit 205.

[0021] DIB 100 includes features which enable the entry of pre-connectorized cables (e.g., cables 110 and/or 120) into the DIB by an installer. Many conventional enclosures require cable

to be fed through slots or apertures of a size which cannot accommodate pre-connectorized cables, but DIB 100 utilizes unique features to accommodate pre-connectorized cables. Yet other features of DIB 100 help to prevent damage to cables due to strain or bending. Both features that facilitate the use of pre-connectorized cables, and features that prevent strain or bending damage to the cables, are illustrated in detail in Figs. 3-1 through 3-4.

[0022] Shown in Fig. 3-1 is a bend limiting cable boot 305 which is formed in a flexible molded clam-shell design to allow the boot to be installed over the pre-connectorized drop cable 110 without having to feed the cable through the boot. The boot 305 has a central channel 309 in which cable 110 is positioned when the two portions of the boot are closed together. Slots 307 are formed in the boot 305 so that the boot is secured to the cable 110 and to a cable clamp bracket (shown in Fig. 3-2) using standard cable ties 311, commonly available to installers. The flexible material, for example rubber, and tapered shape of boot 305 supports the cable 110, preventing a sharp bend in the cable at the edge of the strain-relief clamp 320 (shown in Fig. 3-2) when the cable 110 is pulled in any direction.

[0023] Referring now more particularly to Figs. 3-2 and 3-3, shown are components of a strain-relief cable clamp 320 which comprises a mounting bracket 325 and rigid clamp block 330 that engages the cable jacket of cable 110 in order to retain the cable position when axial force is applied to the cable. One or more threaded fasteners 331 provide a mechanical advantage while engaging the clamp block 330 and cable jacket. The position of the threaded fastener 331 and the shape of the clamp block 330 provide limited access to the general public while allowing the installer to use a “216 wrench”, commonly available to telcom installers. In exemplary embodiments, during factory assembly of the clamp components, the treaded fastener 331 is deformed to prevent clamp components from being separated during field operation. This prevents dropping or losing the components during operation. As is seen in the illustration of Fig. 3-3 which shows clamp block 330 isolated and from a bottom perspective view, the rigid clamp block has ribs/ridges 332 in the cable channels 334 to help keep the cable from slipping when clamped onto the drop cable 110.

[0024] Referring now to Fig. 3-4, shown is a weather proof or weather resistant cable entrance clip feature of DIB 100 in accordance with an exemplary embodiment. In the illustrated exemplary embodiment, cable clips 340 are of a rigid clam shell design to clip over the cable 110 without feeding the cable through. The clips 340 slide into flanges or slots 345 inside of the base

205 in an area adjacent to relief cable clamp, which is outside of base 205, to create a substantially weather tight seal between the clips 340 and base 205 of DIB 100. Closed cell foam gaskets 350 create a weather tight seal between the clips and cable jacket.

[0025] Referring next to Figs. 4-1 and 4-2, shown are the multiple storage compartments or features. As shown, base unit 205 has a hinged connection 401 to cover 210. A fiber storage panel 405 also has a hinged connection 406 to an opposing side of base unit 205. The hinged fiber storage panel 405 has a first or front side 410 (shown in Fig. 4-2) and a second or rear side 415 (shown in Fig. 4-1), both having unique features which aid in providing storage and organization of the various cables described above.

[0026] Base unit 205 includes drop cable storage clips 420. The drop feed cable 110, which enters DIB 100 above the position of strain-relief cable clamp 320 as described above, is fed around the storage clips 420 and stored in the base unit 205 of the DIB. On the rear side 415 of the hinged fiber storage panel 405, there are two sets of spools 430 and 440 and two sets of corresponding storage clips 435 and 445. Spools 430 and storage clips 435 store feed cables 550 (shown in Fig. 5-4). Spools 440 and clips 445 store distribution cables 120. A break-out or furcation plug 450 positioned near the upper end of hinged connection 406 divides the drop feed cable 110 into multiple (e.g., typically four) individual feed cables 550.

[0027] On the front side 410 of hinged fiber storage panel 405 is an adapter bracket 460 which holds one or more connectors or adapters 465, such as four-to-eight port adapters. Adapters 465 convert between the feed cables 550 and the distribution cables 120. The connectors or adapters 465 are standard components used in the telecommunications industry for converting optical fiber signals between feed cables and distribution cables. However, positioning adapters 465 on the front side of hinged panel 405, and in an exemplary embodiment at a center location on the front side of the hinged panel opposite the storage spools and clips positioned on the rear side of the panel, allows for routing of both of the feed cables and the distribution cables while maintaining proper bend radius. Hinged storage panel 405 and DIB include further features, which are described below with reference to Figs. 5-1 through 5-4 and 6-1 through 6-4, that aid in routing and storage of these cables while maintaining a proper bend radius.

[0028] Referring now to Fig. 5-1, shown are mechanisms for, and a method of, storing the feeder cable with outdoor jacket, namely drop cable 110. The above-mentioned cable storage

clips 420 are situated in the base 205 to retain coils of the outdoor jacketed feeder cable without unnecessary stress on the cable or violating minimum bend radius. Using storage clips 420, the cable 110 is coiled in the direction as shown at arrows 505 in accordance with the preferential bend axis or radius for the particular cable type.

[0029] Referring now to Fig. 5-2, shown is arrow 510 representing the routing of cable 110 from base 205 to the rear side 415 of hinged fiber storage panel 405. As discussed above, panel 405 is hinged to provide convenient access to both sides of the panel. The pairs of cable storage spools 430 and 440 and corresponding cable storage clips 435 and 445, as well as routing channels 515 and 532 through which cables transition between the front and rear of panel 405, are positioned and designed to (1) maintain separation of cable storage between the feed cables (stored on spools 430 and clips 435) and the distribution cables 120 (stored on spools 440 and clips 445); (2) support the manufacturer's specified minimum bend radius for the cables; and (3) allow cables to be added after the initial installation without cross-over of cable types. The feeder cable breakout adapter storage area is located on the panel 405 nearest the hinge axis 406 and aligned with the hinge axis to allow easy transition of the drop cable 110 from the storage in the base 205 to the panel 405. The proximity and alignment to the hinge also allows the panel to be operated (open and closed) without excessive stress to the cable transition. The feeder breakout cable storage clips 435 are located in parallel to the breakout adapter storage 450 (see Fig. 4-1) to provide a convenient transition and to maintain minimum bend radius. The feeder break-out cables 550 are routed and stored on spools 430 and clips 435 as represented by arrows 512 shown in Fig. 5-3. As described above the fiber storage panel 405 also incorporates an integrated cable channel 515 that maintains cable radius while transitioning the feeder cables from the storage clips 435 on the back 415 of the panel to the connectors 465 on the front 410 of the panel. Arrow 516 represents the transition of cables 550 into channel 515.

[0030] Referring now more particularly to Fig. 5-3, shown is an integrated cable channel 530 in base 205. Integrated cable channel 530 is positioned parallel to the panel hinge 406 and located to the side edge of base 205 to allow the distribution cable 120 to be routed from the distribution cable entrance 535 to the top of the base and onto the panel 405 through opening 540 without cross-over of the other cable types. Arrow 531 represents the routing of distribution cables 120 from channel 530 onto panel 405. The location of the cable clips 445 and cable channel 532 on the back side 415 of the panel allows the distribution cable 120 to transition from

the backside 415 of panel 405 to the front side 410 of panel 405 without causing unnecessary stress or bending during panel movement or operation. The distribution cable storage clips 445 are oriented to provide a convenient transition and to maintain minimum bend radius. Arrows 514 represent the routing and storage of distribution cables 120 or spools 440 and clips 445. The integrated channel 532 on fiber storage panel 405 transitions the distribution cables 120 from the storage clips 445 on the rear side 415 to the adapters or connectors on the front 410 of the pane while maintaining an acceptable cable radius. Arrow 518 represents the transition into channel 532.

[0031] Referring now to Fig. 5-4, DIB 100 is shown with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above.

[0032] Referring now to Fig. 6-1, shown is panel 405 folded into base unit 205 for storage such that front side 410 of the panel is shown. The adapters or termination connectors 465 discussed above are shown on the front 410 of the panel oriented with respect to the cable channels 515 and 532 to maintain the necessary minimum bend radius during cable installation. Arrows 610 represent the routing of feed cables 550 on the front of panel 405, while arrows 620 represent the routing of distribution cables 120 on the same side. Channels 515 and 532 provide the transitions for these respective cables between the front and rear sides of the panel. Cable routing clips 612 attached to, or formed integrally with, panel 405 are also used to secure cables 120 and 550 to front side 410 of the panel in proper positions to maintain the acceptable bend radius specified by the cable manufacturer.

[0033] Referring now to Fig. 6-2, shown is the pre-connectorized distribution cable entry point 535 for distribution cable 120 in both open (right) and closed (left) positions. This entry point 535 includes an integrated cable grommet cavity 650 with bend limiting flange 645. An integrated portion of the enclosure base 205 provides the flange 645 and forms a cavity 650 to retain and compress the cable grommet 660 to provide a seal between the grommet, base 205, and cables 120. An integrated hinge 665 and latching system 670 are also provided for the cable entry cover portion 675. The integrated radius flange 645 limits the cable bend when pulled in any direction.

[0034] In an exemplary embodiment, the hinged cable entry cover 675 also includes a bend limiting flange 677. The cover 675 is in some embodiments a rigid cover that hinges on the grommet cavity 650. Opening the cover allows the grommet 660 to be removed, and when

closed the cover 675 retains and compresses the grommet to provide a seal between the cover, grommet, base, and cables.

[0035] An example embodiment of a weather resistant pre-connectorized cable grommet 660 is shown in Fig. 6-3. Grommet 660 is, in exemplary embodiments, made of a flexible material such as rubber that will compress and seal against the base, cover and cables. The grommet employs cable ports comprising of thin slices though the material from the perimeter of the grommet towards the center. Near the center, the thin slices form a partial circle. These partial circle slugs can be peeled out to create a cavity for the cable. The radial slices protruding to the perimeter of the grommet can be spread open and a cable inserted without having to thread the cable end through the grommet.

[0036] Referring now to Fig. 6-4, DIB 100 is shown in its folded position (with front 410 of panel 405 shown facing out as the panel is stored in the base) with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above, including the transition channels 515 and 532 as well as the cable adapters or connectors 465 positioned approximately at the center of panel 405.

[0037] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims. For example, in various embodiments, the DIB can be made from materials other than plastic. Further, the various components can be arranged in different ways than those specifically illustrated. Other examples of modifications of the disclosed concepts are also possible, without departing from the scope of the disclosed concepts.

WHAT IS CLAIMED IS:

1. A drop interface box having one or more features as described.
2. A method of routing and storing fiber optic cable as described.

DROP INTERFACE BOX

ABSTRACT

Disclosed are exemplary embodiments of a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel includes spools, cable clips and integrated cable channels that maintain cable radius during transitions of cables from a storage side or plane of the panel to a connector side or plane of the panel.

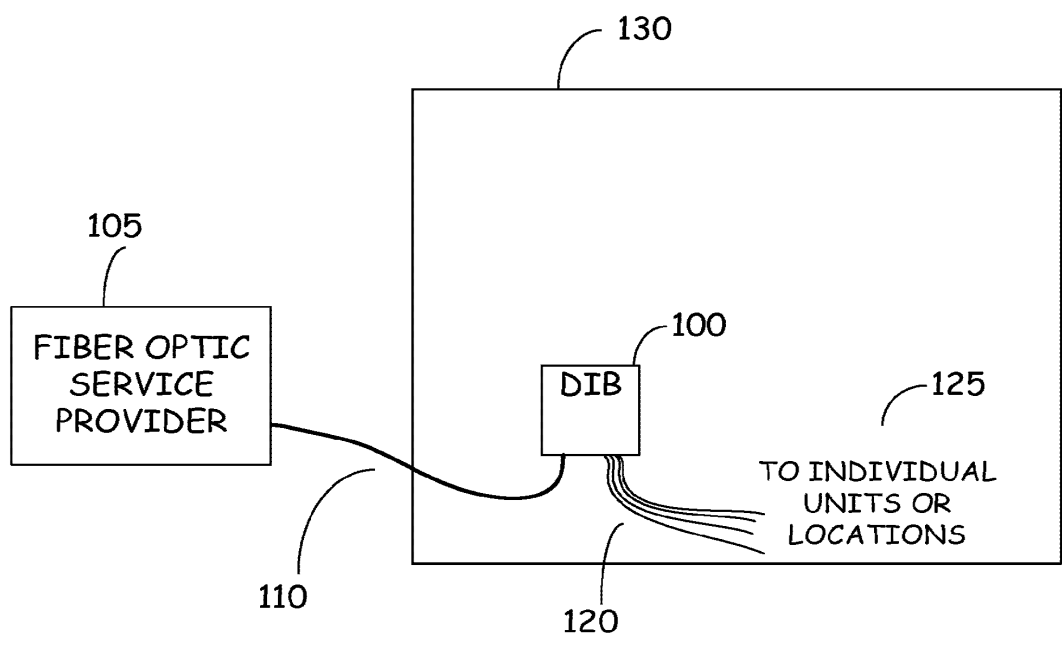


Fig. 1

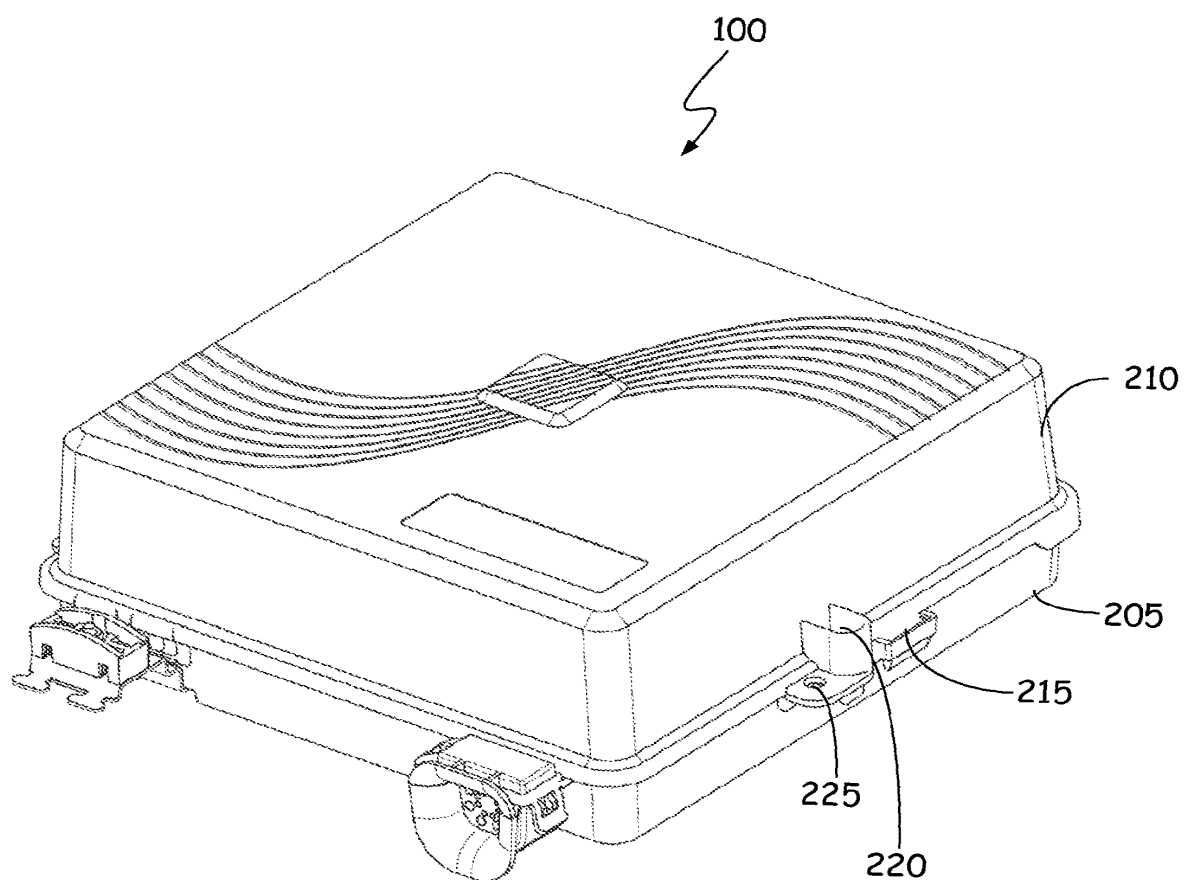


Fig. 2-1

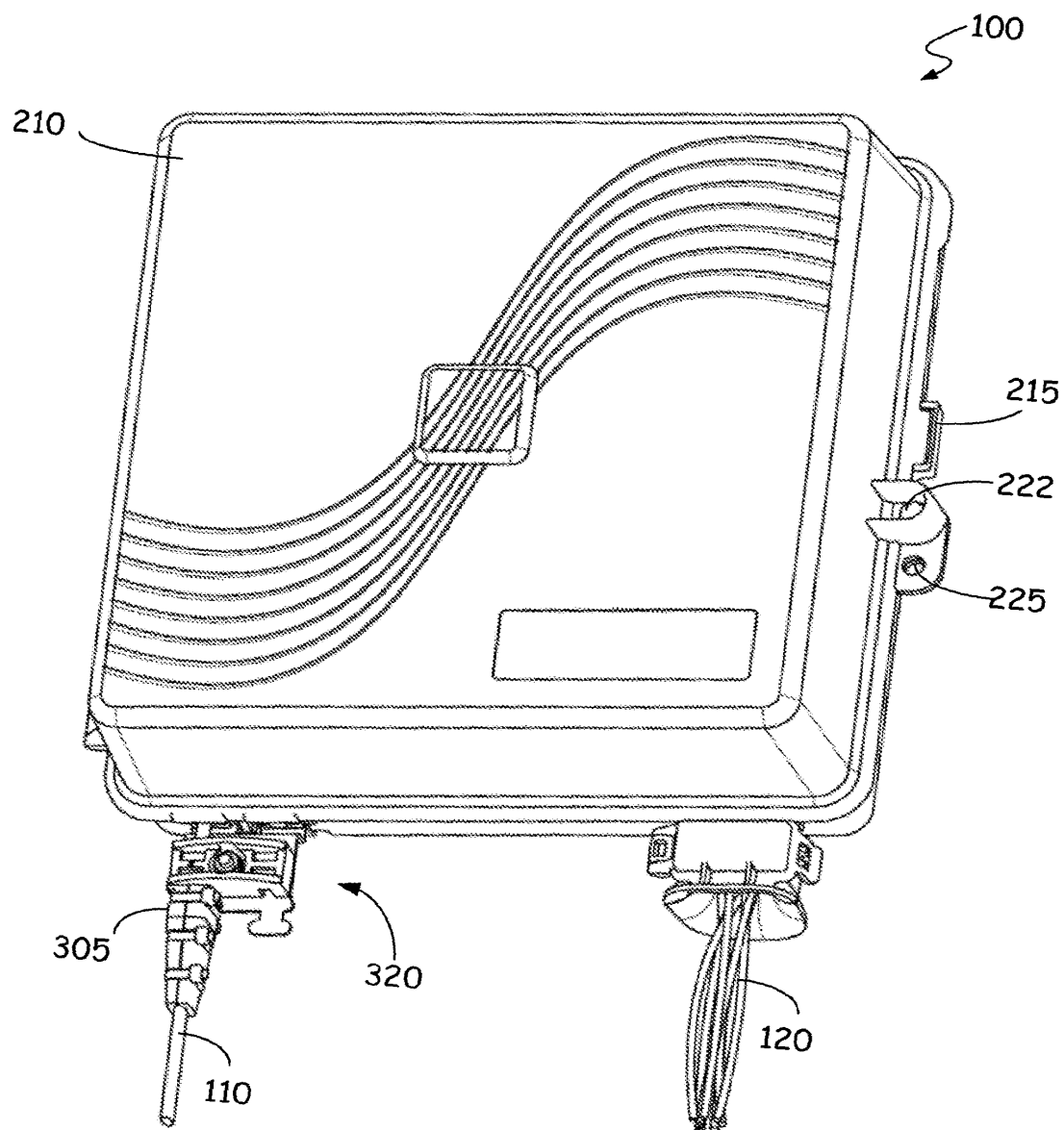


Fig. 2-2

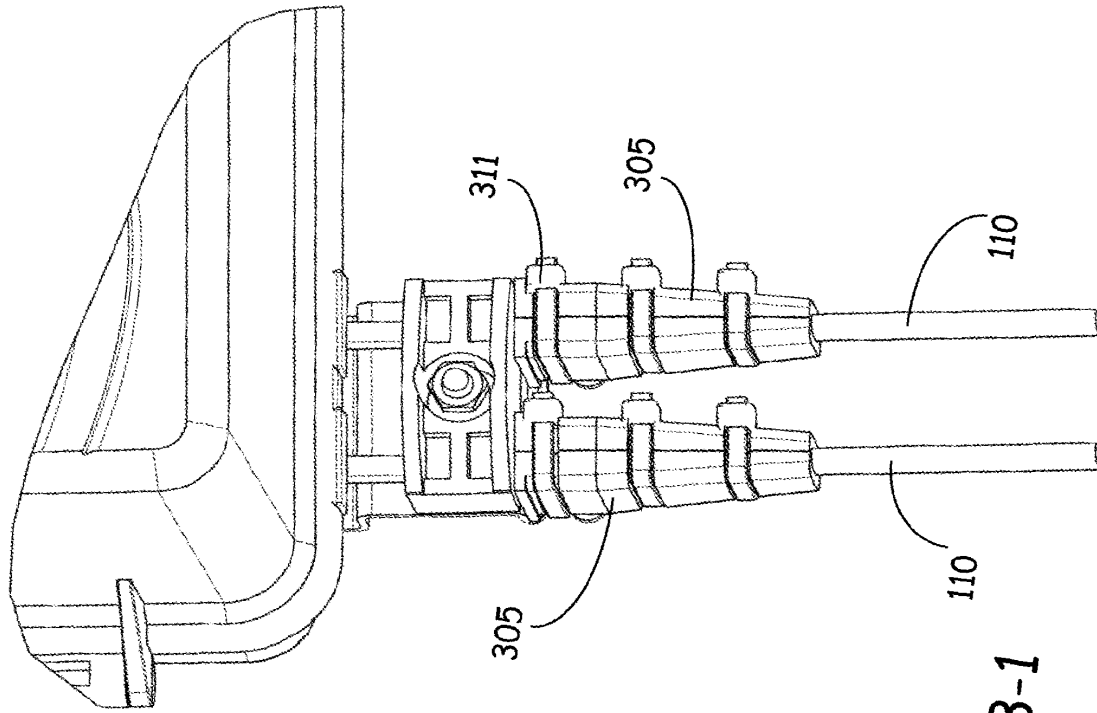
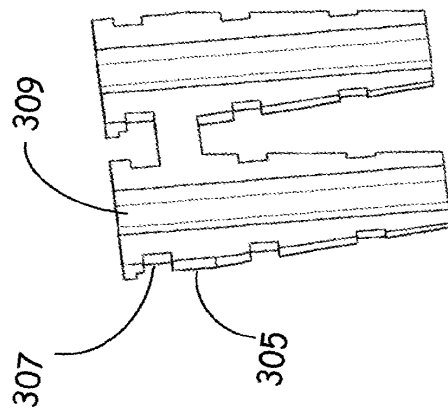


Fig. 3-1



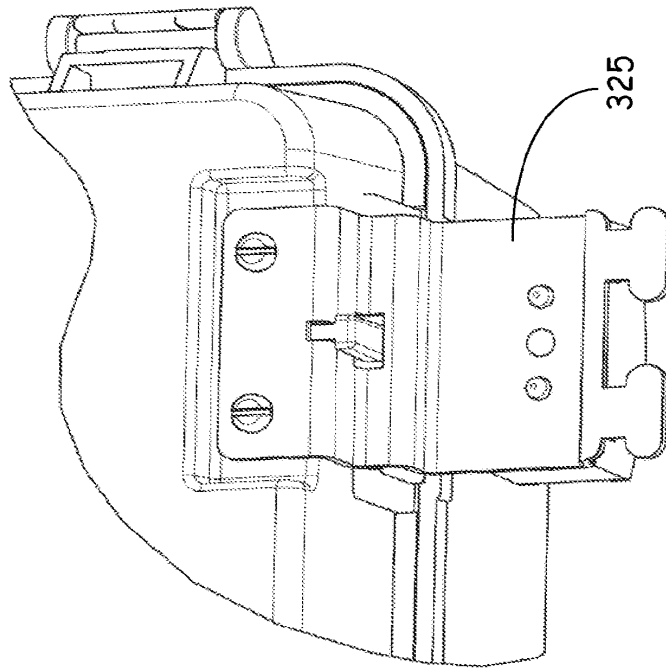
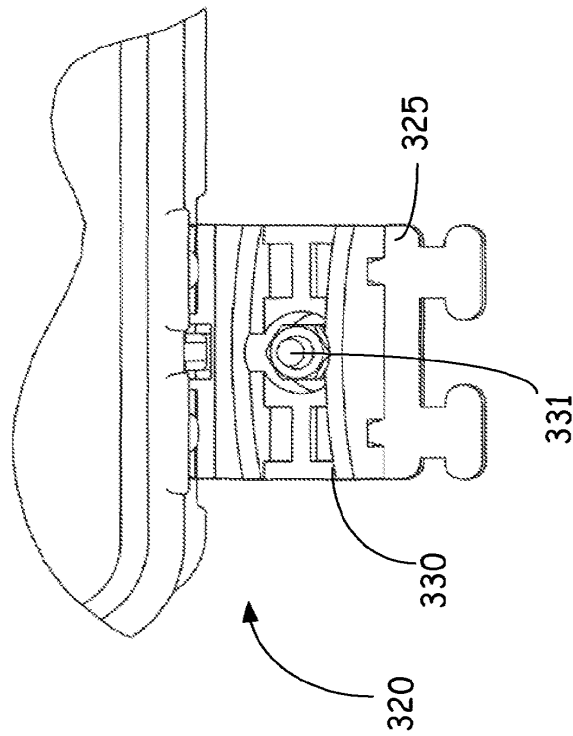


Fig. 3-2

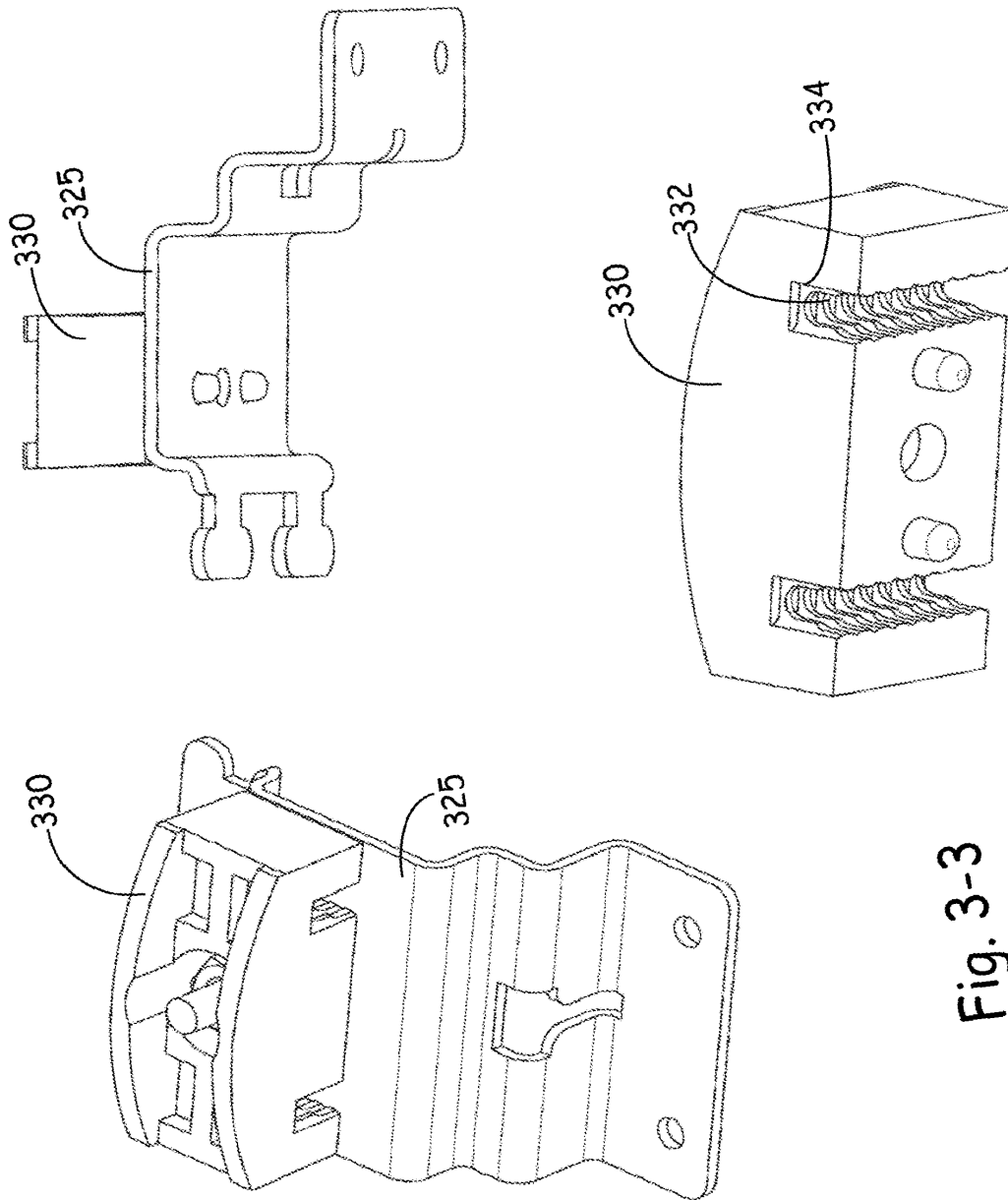


Fig. 3-3

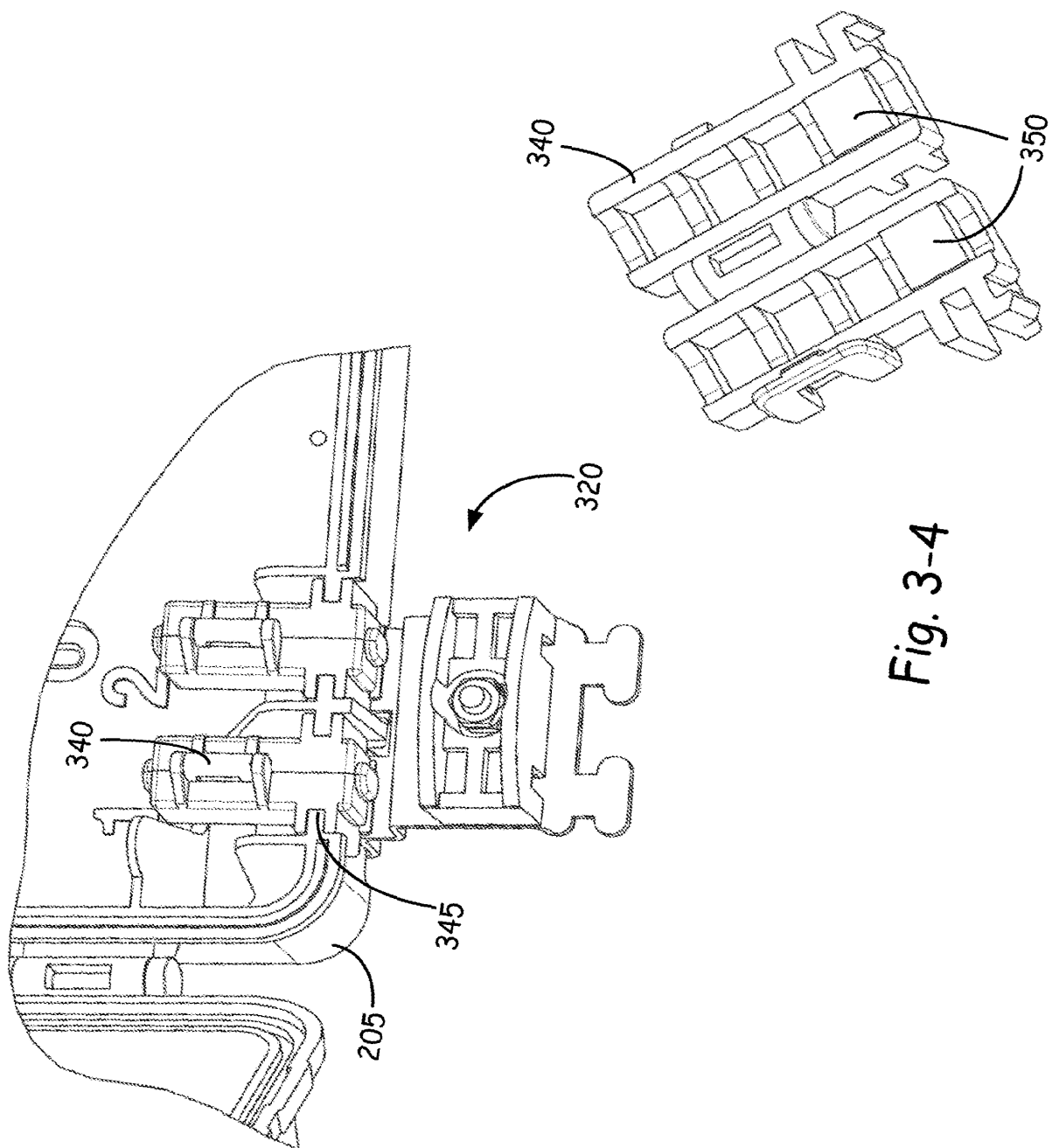


Fig. 3-4

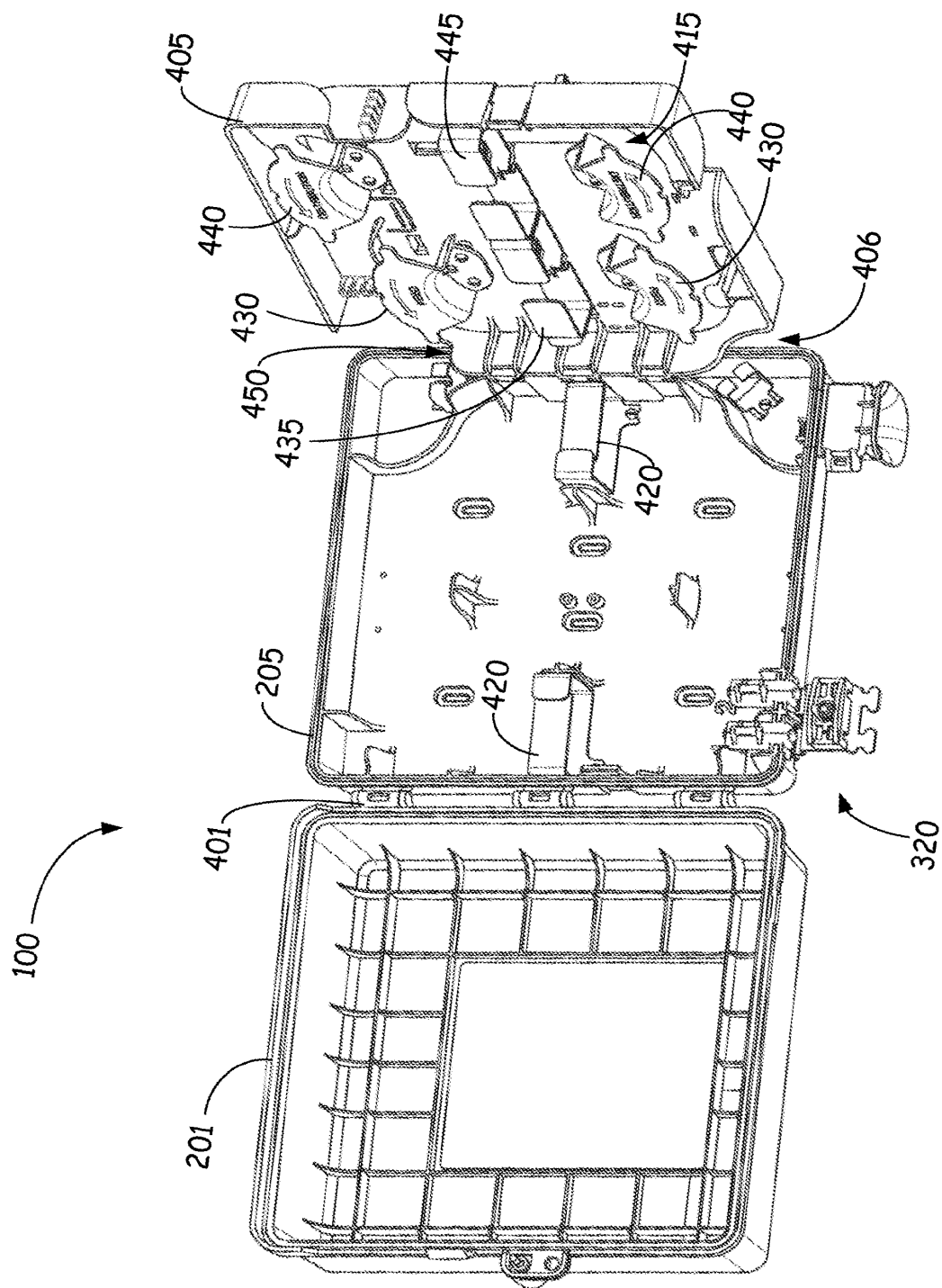


Fig. 4-1

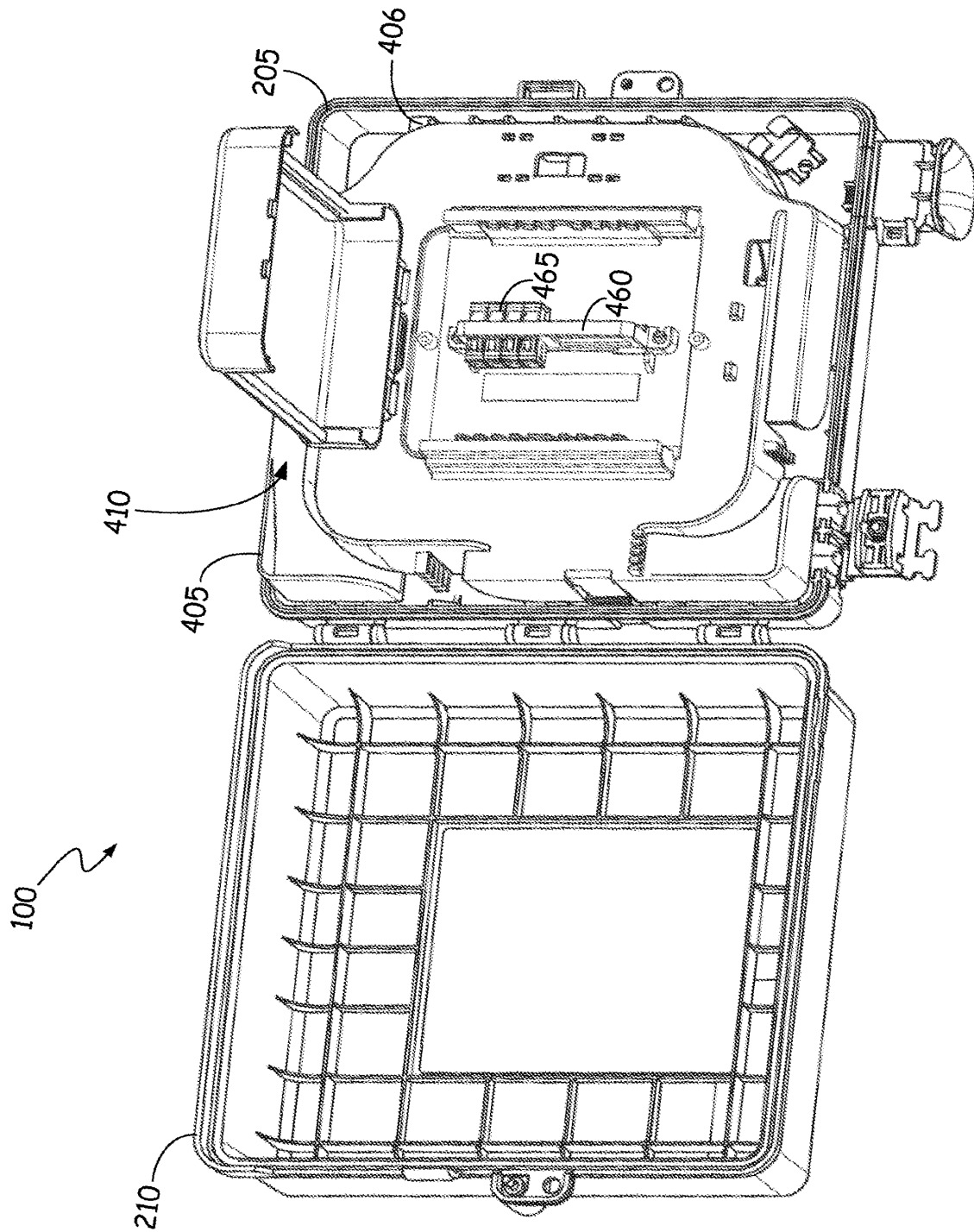


Fig. 4-2

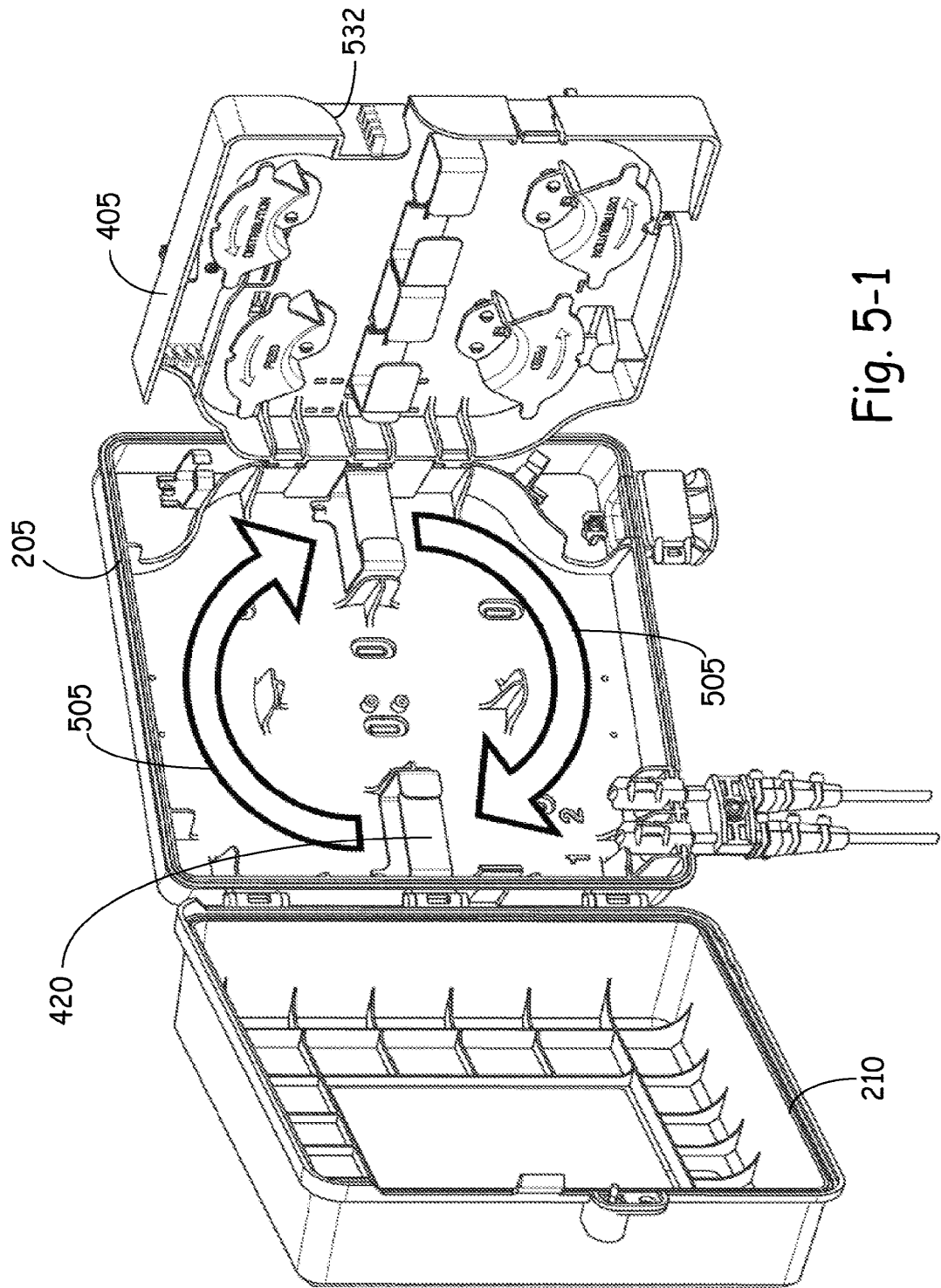


Fig. 5-1

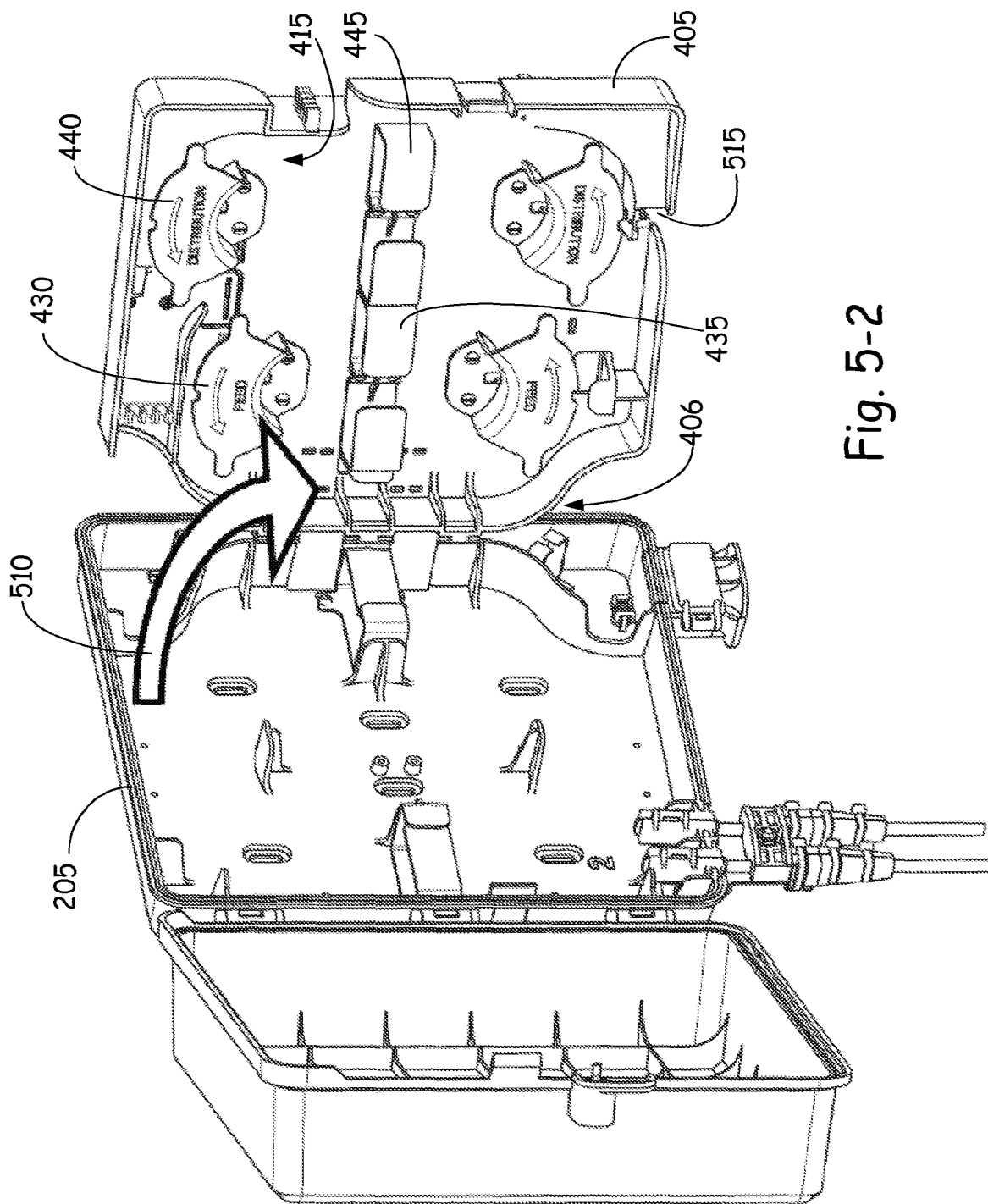


Fig. 5-2

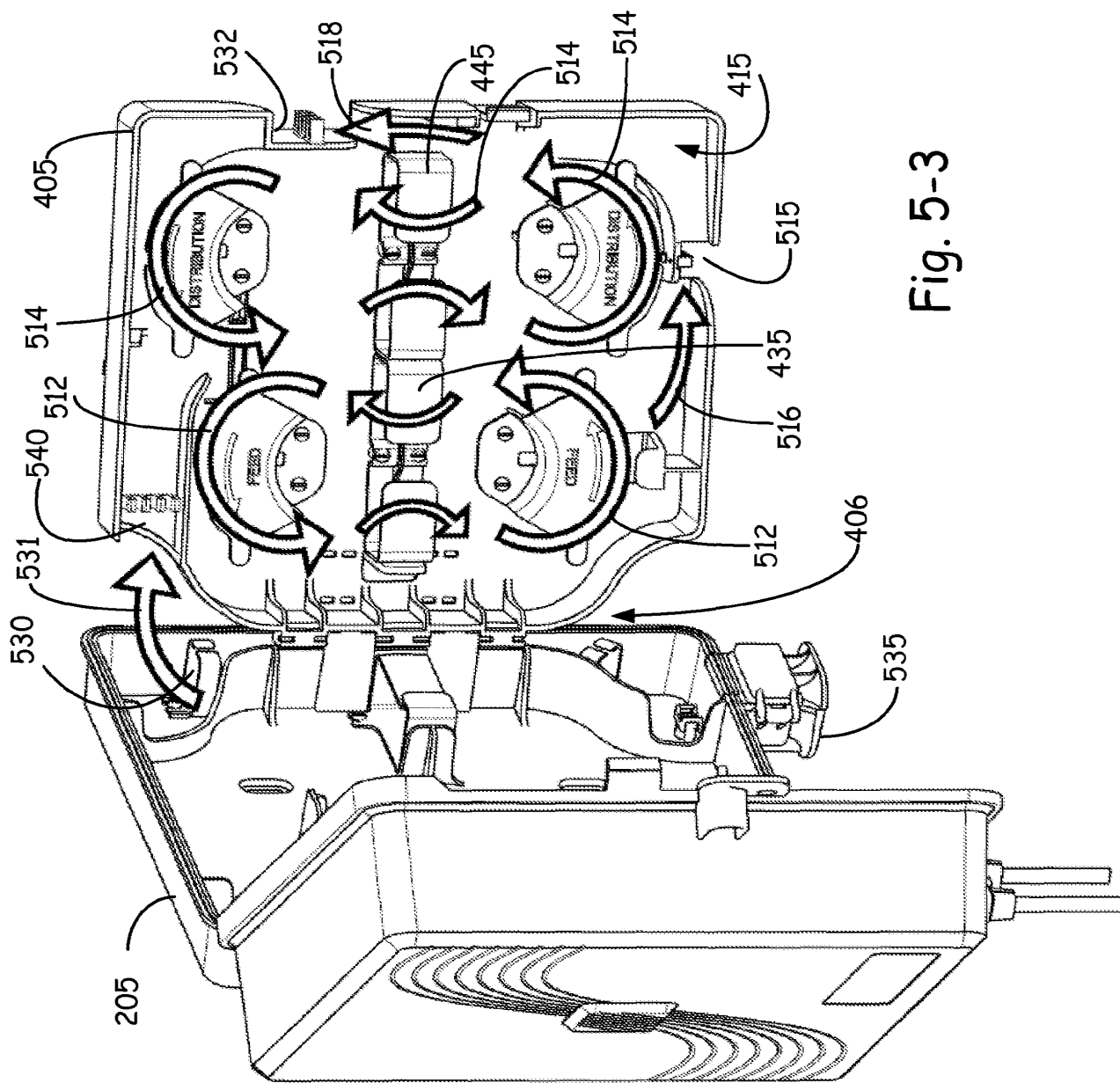


Fig. 5-3

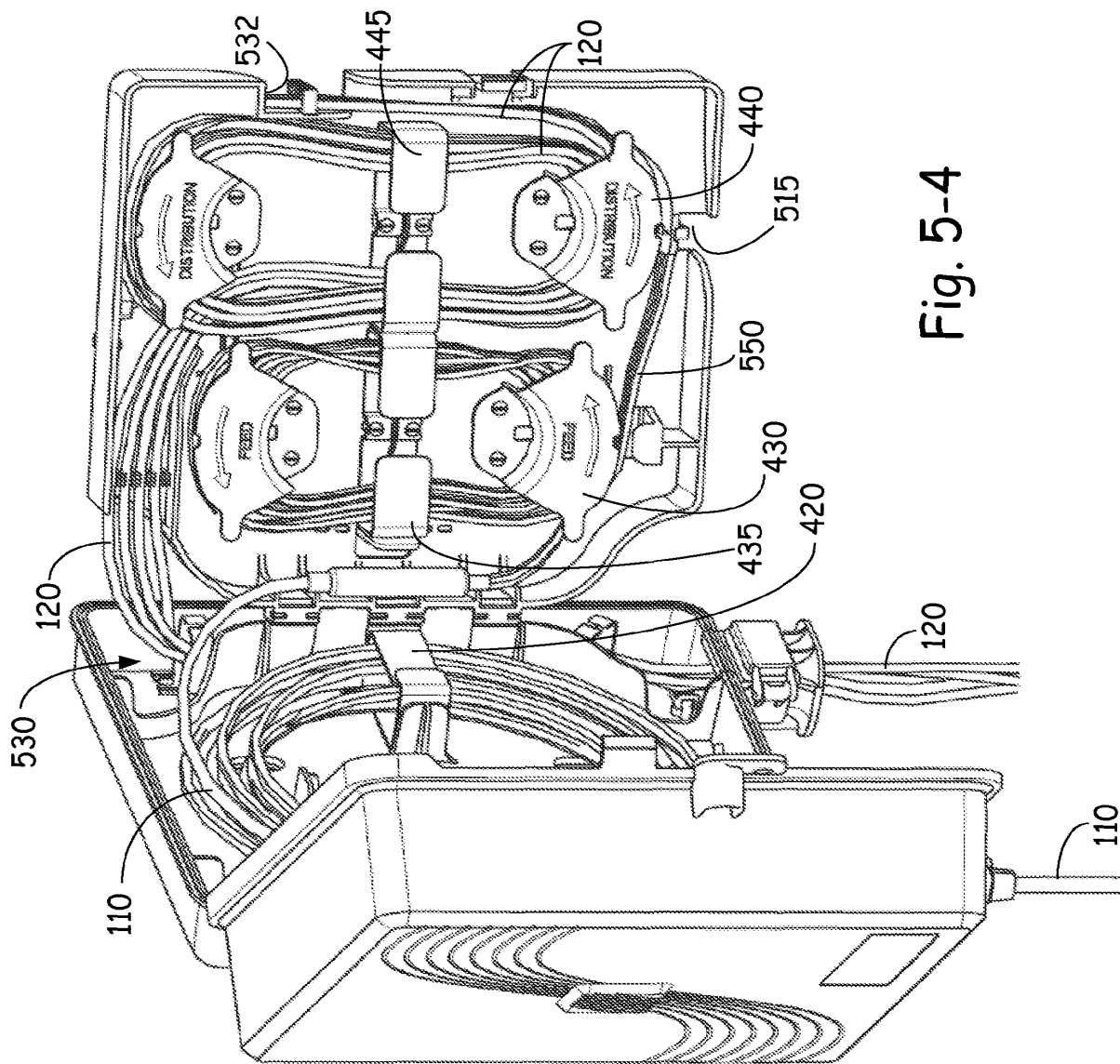


Fig. 5-4

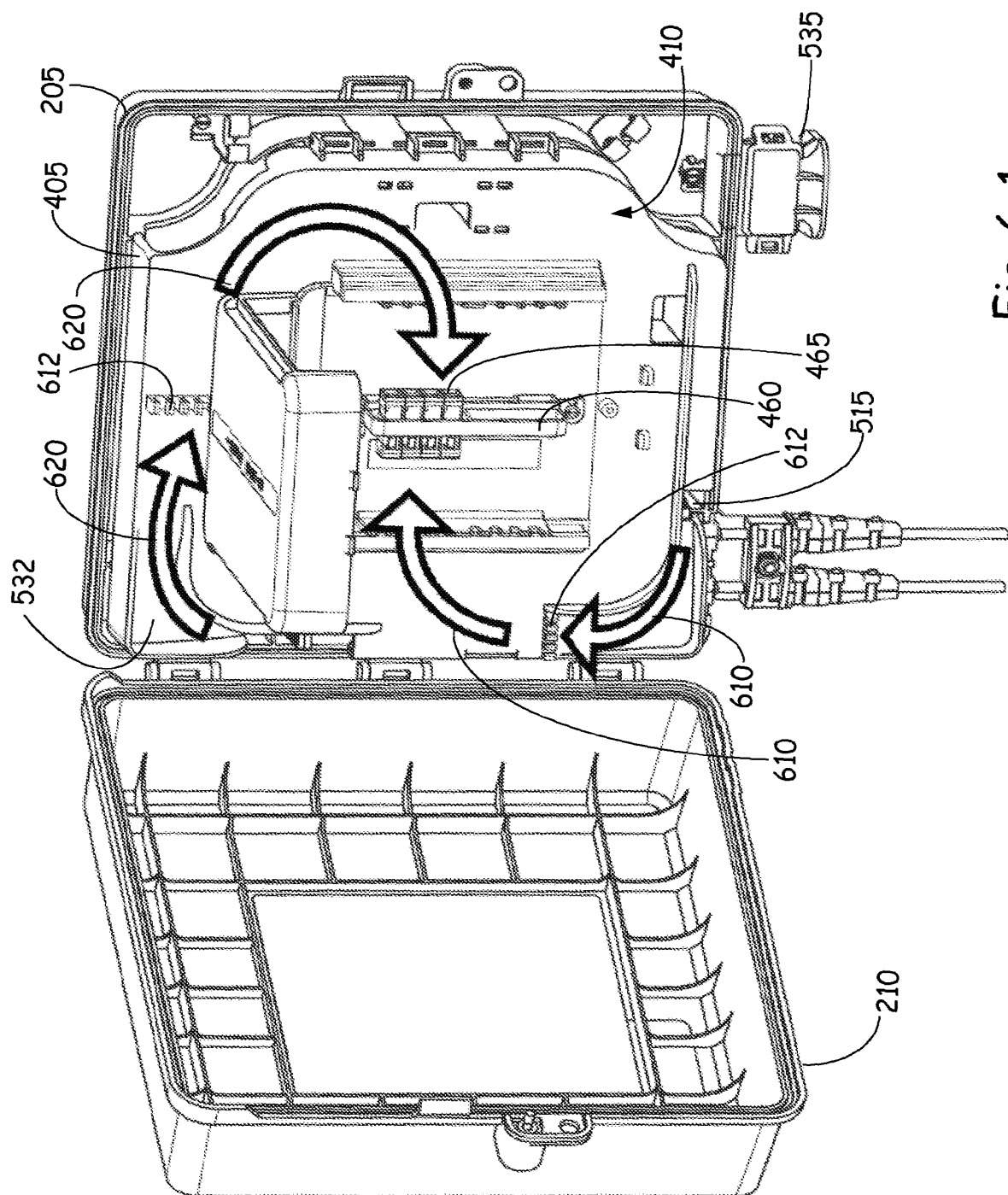


Fig. 6-1

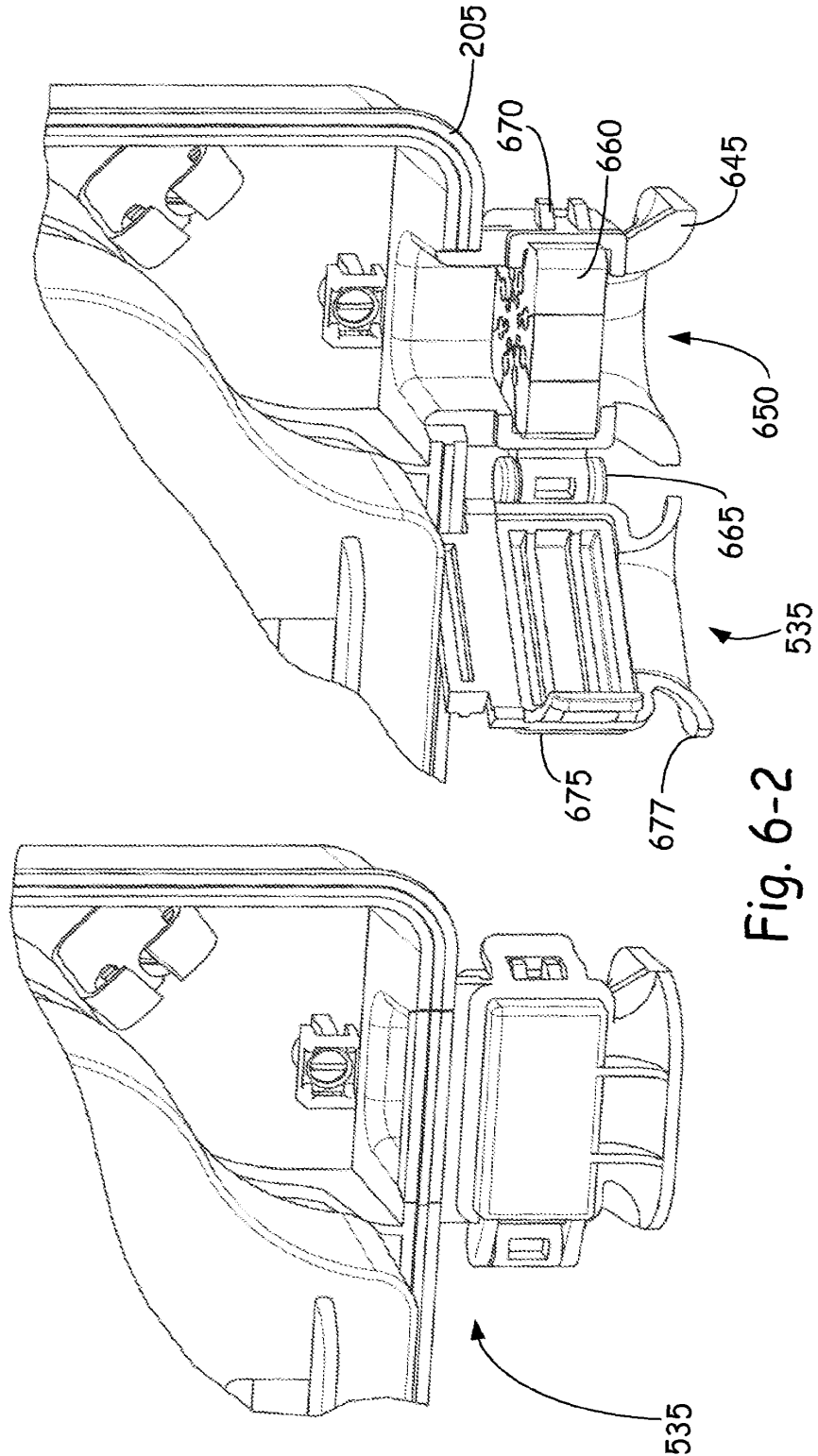


Fig. 6-2

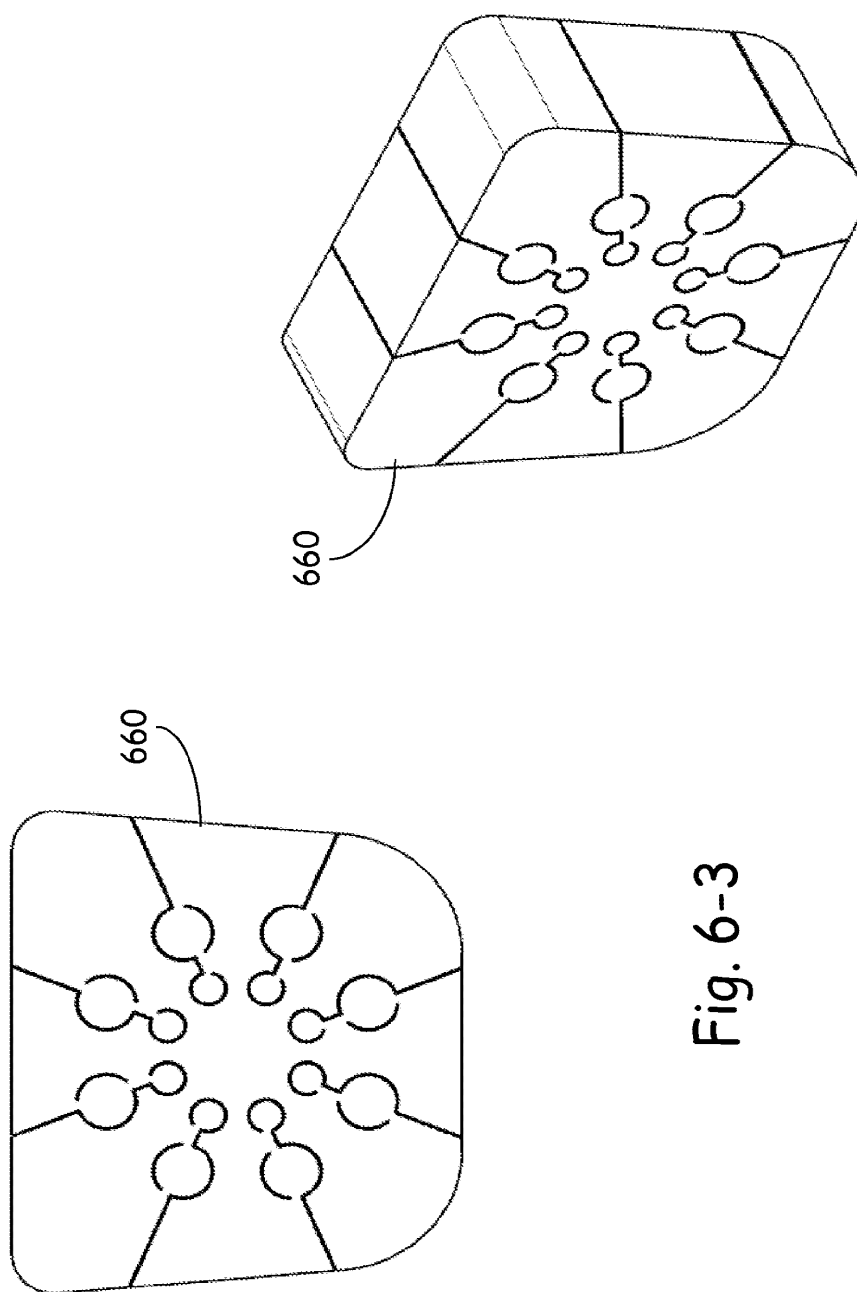


Fig. 6-3

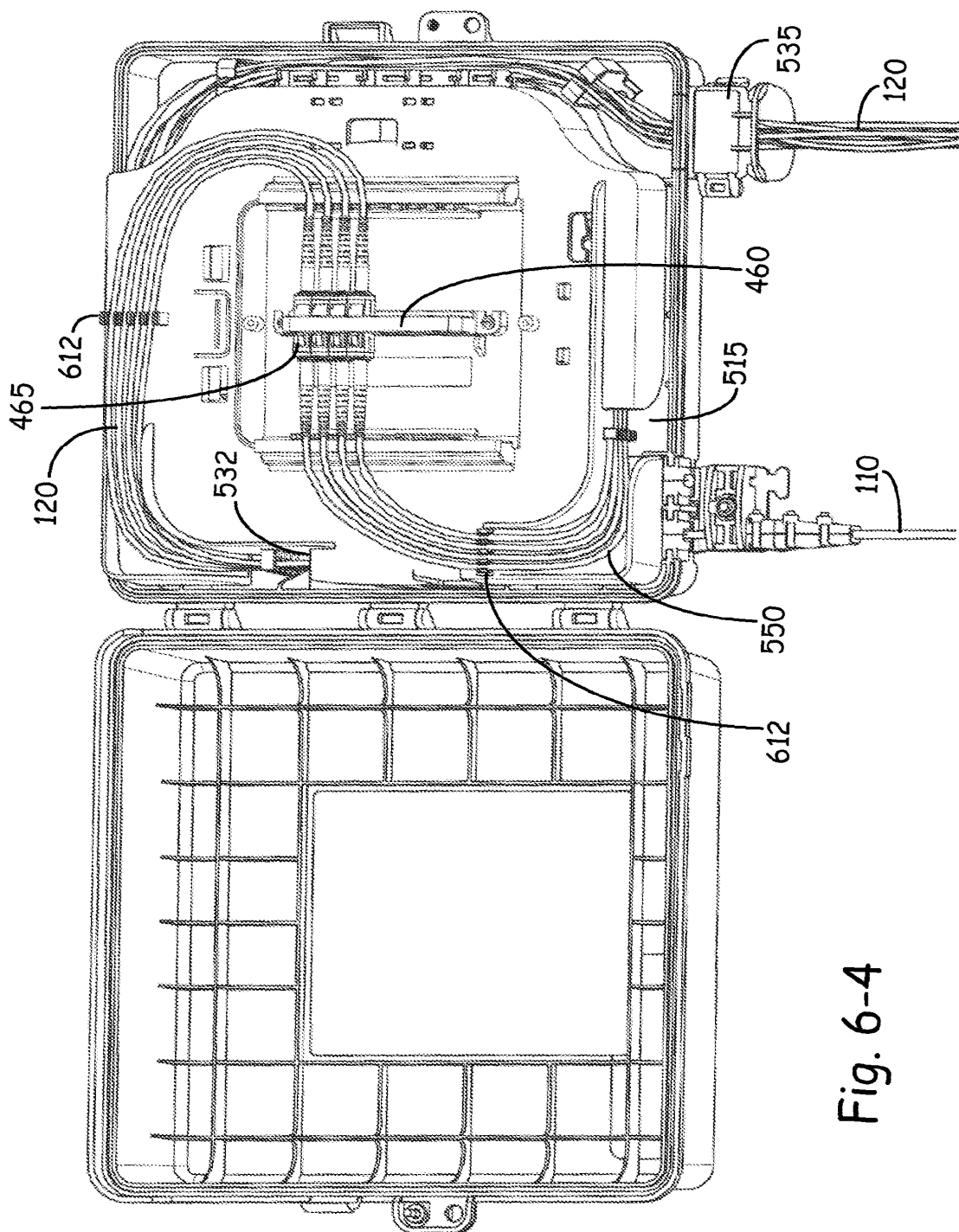


Fig. 6-4

Electronic Acknowledgement Receipt	
EFS ID:	9811721
Application Number:	61472008
International Application Number:	
Confirmation Number:	1633
Title of Invention:	Drop Interface Box
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Theresa Sorbel
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	05-APR-2011
Filing Date:	
Time Stamp:	17:01:36
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$110
RAM confirmation Number	3750
Deposit Account	231123
Authorized User	VELDHUIS-KROEZE,JOHN D.
<p>The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:</p> <p>Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)</p> <p>Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)</p>	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	2011-04-05ADS.pdf	1104108	no	5
			358c4a0b8dc10b98e5459ac741823f60b22dc68		
Warnings:					
Information:					
2		2011-04-05application.pdf	63671	yes	11
			1f20fb9c219616fbcb3d7ae0d0ca50b00cfeffa		
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Specification	1	9		
	Claims	10	10		
	Abstract	11	11		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	2011-04-05figures-provisional.pdf	2091480	no	17
			b247e1f0dd7240f668b542ce187ee97e0ca5c7d28		
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	29493	no	2
			b98037ee4ab242f22bb56c757309bd1a3ba39709		
Warnings:					
Information:					
Total Files Size (in bytes):			3288752		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

New International Application Filed with the USPTO as a Receiving Office

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

**DOCUMENT MADE AVAILABLE UNDER THE
PATENT COOPERATION TREATY (PCT)**

International application number:	PCT/US2012/032320
International filing date:	05 April 2012 (05.04.2012)
Document type:	Certified copy of priority document
Document details:	Country/Office: US
	Number: 61/472,008
	Filing date: 05 April 2011 (05.04.2011)
Date of receipt at the International Bureau:	16 April 2012 (16.04.2012)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a),(b) or (b-bis)

PCT

REQUEST

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

For receiving Office use only

PCT/US12/32320

International Application No.

05 APR 2012(05.04.2012)

International Filing Date

RO/US

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference

(if desired) (12 characters maximum) C64.13-0020/JVK

Box No. I	TITLE OF INVENTION	
	DROP INTERFACE BOX	
Box No. II	APPLICANT	☐ This person is also inventor.
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)		Telephone No.
COMMUNICATION SYSTEMS, INC. 1001 East Highway 212 Hector, Minnesota 55342 United States of America		Facsimile No.
		Applicant's registration No. with the Office
State (that is, country) of nationality: US		State (that is, country) of residence: US
This person is applicant ☐ all designated States ☒ all designated States except the United States of America ☐ the United States ☐ the States indicated in the Supplemental Box		
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)		
☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.		
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE		
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative		
Name and Address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		Telephone No. (612) 334-3222
VELDHUIS-KROEZE, John D. WESTMAN, CHAMPLIN & KELLY, P.A. 900 Second Avenue South, Suite 1400 Minneapolis, Minnesota 55402-3319 United States of America		Facsimile No. (612) 334-3312
		Agent's registration No. with the Office 38,354
☐ Address correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.		

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<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
Name and Address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) LARSSON, Nicholas B. 219 Schendel Street PO Box 152 Blomkest, Minnesota 56216 United States of America	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only (<i>If this check-box is marked, do not fill in below.</i>)
	Applicant's registration No. with the Office
State (<i>that is, country</i>) of nationality: US	State (<i>that is, country</i>) of residence: US
This person is applicant ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and Address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) SWIENTON, Andrew E. 4570 Ranier Court North Plymouth, Minnesota 55446 United States of America	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only (<i>If this check-box is marked, do not fill in below.</i>)
	Applicant's registration No. with the Office
State (<i>that is, country</i>) of nationality: US	State (<i>that is, country</i>) of residence: US
This person is applicant ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and Address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) WAKILEH, George I. 440 Judd Lane Batavia, Illinois 60510 United States of America	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only (<i>If this check-box is marked, do not fill in below.</i>)
	Applicant's registration No. with the Office
State (<i>that is, country</i>) of nationality: US	State (<i>that is, country</i>) of residence: US
This person is applicant ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and Address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only (<i>If this check-box is marked, do not fill in below.</i>)
	Applicant's registration No. with the Office
State (<i>that is, country</i>) of nationality:	State (<i>that is, country</i>) of residence:
This person is applicant ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Supplemental Box

Use this box in the following cases:

1. If, in any of the Boxes, except Boxes Nos. VIII(i) to (v) for which a special continuation box is provided, **the space is insufficient** to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) **if more than two persons are involved as applicants and/or inventors** and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. the country of the address indicated in this Box is the applicant's State (that is, country) of resident if no State of resident is indicated below;
- (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "**the States indicated in the Supplemental Box**" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian or OAPI patent) for the purposes of which the named person is applicant;
- (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, **the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America**: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
- (iv) if, in addition to the agent(s) indicated in Box No. IV, there are **further agents**: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
- (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "**patent of addition**," or "**certificate of addition**," or if, in Box No. V, the name of the United States of America is accompanied by an indication "**continuation**" or "**continuation-in-part**": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
- (vi) if in Box No. VI, there are **more than five earlier applications whose priority is claimed**: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;

2. If, with regard to the **precautionary designation statement** contained in Box No. V, the applicant wish to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

CONTINUATION OF BOX NO. IV.

WESTMAN, Nickolas E.
 MAGEE, Theodore M.
 CHAMPLIN, Judson K.
 BRUSH, David D.
 KAUL, Brian D.
 KELLY, Joseph R.
 KOEHLER, Steven M.
 CHRISTENSON, Christopher R.
 SAWICKI, Z. Peter.
 FINUCANE, Hallie A.
 HOLT, Christopher L.
 KVALE, Deirdre M.
 YOUNG, James L.
 FARRELL, Leanne T.
 REGO, Alan G.
 BOHN, David C.
 IMS, Peter J.
 VOLKMANN, Christopher J.
 LAUER, Mai D.
 MORRISON, Brian R.

ALL ABOVE ATTORNEYS ARE MEMBERS OF THE FIRM OF
 WESTMAN, CHAMPLIN & KELLY, P.A.
 900 Second Avenue South, Suite 1400
 Minneapolis, Minnesota 55402-3319, USA
 Telephone: 612/334-3222 Facsimile: 612/334-3312

Box No. V DESIGNATIONS				
The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents. However,				
☐ DE Germany is not designated for any kind of national protection ☐ JP Japan is not designated for any kind of national protection ☐ KR Republic of Korea is not designated for any kind of national protection ☐ RU Russian Federation is not designated for any kind of national protection <i>(The check-boxes above may only be used to exclude (irrevocably) the designations concerned if, at the time of filing or subsequently under Rule 26bis.1, the international application contains in Box No. VI a priority claim to an earlier national application filed in the particular State concerned, in order to avoid the ceasing of the effect, under the national law, of this earlier national application.)</i>				
Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application <i>day/month/year</i>	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 05 April 2011 (05.04.2011)	61/472,008	US		
item (2)				
item (3)				
☐ Further priority claims are indicated in the Supplemental Box				
Transmitted certified copy: the receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) <i>(only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office)</i> identified above as: ☐ all items ☒ item (1) ☐ item (2) ☐ item (3) ☐ other, see Supplemental Box				
Restore the right of priority: the receiving Office is requested to restore the right of priority for the earlier application(s) identified above or in the Supplemental Box as item(s) (_____). <i>(See also the Notes to Box No. VI; further information must be provided to support a request to restore the right of priority.)</i>				
Incorporation by reference: where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) <i>(If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):</i> ISA / EP				
Request to use results of earlier search; reference to that search <i>(if an earlier search has been carried out by or requested from the International Searching Authority):</i> Date (date/month/year) Number Country (or regional Office)				
Box No. VIII DECLARATIONS				
The following declarations are contained in Boxes Nos. VIII(i) to (v) <i>(mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):</i>				Number of Declarations
☐	Box No. VIII (i)	Declaration as to the identity of the inventor	:	
☐	Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	:	
☐	Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	:	
☐	Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)	:	
☐	Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	:	

Box No. IX CHECK LIST; LANGUAGE OF FILING		
<p>This international application contains:</p> <p>(a) the following number of sheets:</p> <p style="margin-left: 40px;">request (including declaration and supplemental sheets) 5</p> <p style="margin-left: 40px;">description (excluding sequence listing and/or tables related thereto) 9</p> <p style="margin-left: 40px;">claims 3</p> <p style="margin-left: 40px;">abstract 1</p> <p style="margin-left: 40px;">drawings 17</p> <hr style="width: 100%;"/> <p style="margin-left: 40px;">Sub-total number of sheets sequence listing 35</p> <p style="margin-left: 40px;">tables related thereto (for both, actual number of sheets if filed on paper, whether or not also filed in electronic form; see (c) below) 35</p> <hr style="width: 100%;"/> <p style="margin-left: 40px;">Total Number of sheets 35</p> <p>(b) ☐ only in electronic form (Section 801(a)(i))</p> <p style="margin-left: 20px;">(i) ☐ sequence listing</p> <p style="margin-left: 20px;">(ii) ☐ tables related thereto</p> <p>(c) ☐ also in electronic form (Section 801 (a)(ii))</p> <p style="margin-left: 20px;">(i) ☐ sequence listing</p> <p style="margin-left: 20px;">(ii) ☐ tables related thereto</p> <p style="margin-left: 40px;">Type and number of carriers (diskette, CD-ROM, CD-R or other) on which are contained the</p> <p style="margin-left: 60px;">☐ sequence listing</p> <p style="margin-left: 60px;">☐ tables related thereto</p> <p style="margin-left: 40px;">(additional copies to be indicated under item 9(ii), and/or 10(ii) in right column):</p>	<p>This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item):</p> <ol style="list-style-type: none"> 1. ☐ fee calculation sheet 2. ☐ original separate power of attorney 3. ☐ original general power of attorney: 4. ☐ copy of general power of attorney; reference number, if any 5. ☐ statement explaining lack of signature 6. ☐ priority document(s) identified in Box No. VI as item(s) 7. ☐ translation of international application into (language) 8. ☐ separate indications concerning deposited microorganism or other biological material 9. ☐ sequence listing in electronic form (indicate type and number of carriers) <ol style="list-style-type: none"> (i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application) (ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter (iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing mentioned in left column 10. ☐ tables in electronic form related to sequence listing (indicate type and number of carriers) <ol style="list-style-type: none"> (i) ☐ copy submitted for the purposes of international search under Section 802 (b-quater) only (and not as part of the international application) (ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater) (iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column 11. ☒ other (specify): International Application Transmittal Letter 	<p>Number of items</p> <p style="margin-top: 500px;">1</p>
<p>Figure of the drawings which should accompany the abstract: <u>5-4</u></p>	<p>Language of filing of the international application: <u>English</u></p>	
<p>Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE</p> <p>Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).</p>		
<p>/John D. Veldhuis-Kroeze, Reg. # 38,354/</p> <hr style="width: 50%; margin: 10px auto;"/> <p>John D. Veldhuis-Kroeze, Agent of Record 05-04-2012</p>		

For receiving Office use only

<p>1. Date of actual receipt of purported international application: 05 APR 2012</p> <p>3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:</p> <p>4. Date of timely receipt of the required corrections under PCT Article 11(2):</p> <p>5. International Searching Authority (if two or more are competent): ISA/ EP</p>	<p>2. Drawings:</p> <p>☐ received:</p> <p>☐ not received:</p>
<p>6. ☐ Transmittal of search copy delayed until search fee is paid</p>	

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<p>Date of receipt of the record copy by the International Bureau:</p>
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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To: see form PCT/ISA/220		WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)	
		Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)	
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/US2012/032320	International filing date (day/month/year) 05.04.2012	Priority date (day/month/year) 05.04.2011	
International Patent Classification (IPC) or both national classification and IPC INV. G02B6/44			
Applicant COMMUNICATION SYSTEMS, INC.			
<p>1. This opinion contains indications relating to the following items:</p> <ul style="list-style-type: none">☒ Box No. I Basis of the opinion☐ Box No. II Priority☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability☐ Box No. IV Lack of unity of invention☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement☐ Box No. VI Certain documents cited☐ Box No. VII Certain defects in the international application☐ Box No. VIII Certain observations on the international application <p>2. FURTHER ACTION</p> <p>If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.</p> <p>If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.</p> <p>For further options, see Form PCT/ISA/220.</p> <p>3. For further details, see notes to Form PCT/ISA/220.</p>			
Name and mailing address of the ISA:  European Patent Office Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840		Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Ciarrocca, Marco Telephone No. +49 30 25901-0 

Form PCT/ISA/237 (Cover Sheet) (July 2009)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2012/032320

Box No. I Basis of the opinion

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

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

1. Statement

Novelty (N)	Yes: Claims	<u>5-10</u>
	No: Claims	<u>1-4, 11-14</u>
Inventive step (IS)	Yes: Claims	<u>5-10</u>
	No: Claims	<u>1-4, 11-14</u>
Industrial applicability (IA)	Yes: Claims	<u>1-14</u>
	No: Claims	

2. Citations and explanations

see separate sheet

- 1 Reference is made to the following documents:
 - D1 JP 2009 109729 A (NITTO) 21 May 2009
 - D2 US 2007/086721 A1 (DOBBINS ET AL) 19 April 2007
 - D3 US 2003/103750 A1 (LAPORTE ET AL) 5 June 2003
 - D4 US 2009/202214 A1 (HOLMBERG ET AL) 13 August 2009
 - D5 JP 2006 195498 A (NTT) 27 July 2006
 - D6 US 5 109 467 A (HOGAN ET AL) 28 April 1992
 - D7 US 2004/062508 A1 (BLANKENSHIP ET AL) 1 April 2004
- 2 Claim 1 defines first and second spools such that the drop interface box comprises a plurality of first spools and a plurality of second spools. This implies that plural first coils can be wound around the plural first spools and that plural second coils can be wound around the plural second spools. However such an interpretation is not supported by the figures. According to the figures the spool structures 430 and 440 include each exactly two partial spools and each set of partial spools function together to allow a single coil to be wound around the set. It is therefore not clear (Art. 6 PCT) how to interpret the features "first spools" and "second spools".

This objection could be overcome by defining a first *set of* spools and a second *set of* spools in claim 1 as disclosed in [0026] of the description.
- 3 Notwithstanding the lack of clarity, it appears that the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
- 3.1 D1 discloses in fig. 7 in combination with fig. 1 a box (1+1+2+2a) suitable for use as a drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service (the openings in the sides appear to allow passage of cables which can be considered to be drop can distribution cables), the drop interface box comprising:

a base unit (bottom tray 1) having a drop cable entrance (for example the cut-out at the bottom corner) configured to receive the drop cable and having drop

cable retaining mechanisms (winding members, see [0024]) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover 2a (fig. 1) having a hinged 3 connection (indirect - see also [0017] of the present application) to the base unit (bottom tray 1 in fig. 7) to selectively enclose a storage area provided in the base unit; and

a fiber storage panel moveable (upper tray 1 in fig. 7) relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools (some of the winding members) positioned to store a plurality of feed break-out cables coupleable to the drop cable, the fiber storage panel further having second spools (other winding members) positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables.

Although D1 does not disclose the use of the box as a drop interface box with drop, feed break-out and distribution cables it appears suitable to use it as claimed, and the device claim 1 does not apparently include the cables in its scope.

Hence the subject-matter of claim 1 is not new.

- 3.2 A similar lack of novelty objection exists on account of D2 which discloses a cover 14 hinged 28 to a base 18, drop cable retaining mechanisms 116 (fig. 6 & [0044]) and first and second spools (fig. 7 & 8: sets of reels 120, 124 on plural trays 84) on moveable panels (trays 84).
- 3.3 A similar lack of novelty objection exists on account of D3 which discloses in the fig. 6 variant of fig. 1-3 a cover 50 hinged 52 to a base 20, drop cable retaining mechanisms 25 (fig. 2) and first and second spools (four spool elements are shown in fig. 6) on moveable panel 40. Although in D3 cable 12 is referred to as a drop cable and cable 16 as a distribution cable, it is possible to retain a drop cable using retaining mechanisms 25, and to store feed break-out cables as well as distribution cables in the spools.
- 4 Furthermore, the above-mentioned lack of clarity notwithstanding, and without prejudice to the previous novelty objections, it appears that the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT, and the criteria of Article 33(1) PCT are therefore not met.
- 4.1 D4 discloses with particular reference to [0052] and [0053] fig. 6 and 7 a wall box 200 suitable for use as a drop interface box configured to be mounted to a structure [0051] and to receive a drop cable ([0052], first sentence "cable") from an optical fiber service provider distribution point and a plurality of

distribution cables ([0053] "e.g., a distribution cable") which distribute the optical fiber service, the drop interface box comprising:

a base unit 216 having a drop cable entrance (fig. 8-11, 222) configured to receive the drop cable and having drop cable retaining mechanisms 264 spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms ([0052] "The stripped portion of the cable can then be spooled around the bend radius limiters 264");

a cover 220 having a hinged connection ([0038] "pivotal connection ... hinge pins 242") to the base unit 216 to selectively enclose a storage area provided in the base unit; and

a fiber storage panel 230 moveable relative to the base unit (from fig. 6, the panel is not permanently attached to the base unit 216) and configured to be stored between the base unit and the cover, the fiber storage panel having a first spool 298 positioned to store a plurality of feed break-out cables ([0053] "terminated fiber") coupleable to the drop cable, the fiber storage panel further having second spools 292 positioned to store a plurality of distribution cables ([0053] "e.g., a distribution cable") coupleable to the plurality of feed break-out cables.

According to D4, [0045] the first spool 298 comprises a single cylindrical spool 300.

The subject-matter of claim 1 thus differs in that first spools (i.e. a plurality of first spools) are provided.

It is standard to form a spool out of two halves which can each be considered to be partial spools. It appears obvious to implement this standard alternative in D4. Hence the subject-matter of claim 1 lacks an inventive step.

- 4.2 D5 discloses in the figures and the EPODOC and WPI abstracts, drop cable retaining mechanisms on spool 24 and next to hinge 20, first spools 32 and second spools 36 (each in a different tray 12B) on a moveable panel 12. In D5 the cover 54 (fig. 6) is apparently not hinged to the base unit. However since a hinged cover is a standard alternative (See e.g. D3 [0015] and D7 [0012]), it appears obvious to implement such a cover in D5. Hence the subject-matter of claim 1 lacks an inventive step.
- 4.3 D6 discloses in fig. 2-4 (see also col. 3, lines 10-27) first spools 28 and second spools 30 (i.e. two sets of spools, termed "radiuses" in D6) removeably secured to the base 14 and a hinged cover 21. As is visible in fig. 3 on the hinged side of the box two panels with a vertical line of holes are shown. In fig. 4 and 7 the right hand most line of holes appears to be used for

fixing a cable tie which holds the fibers in cable bundle 12. It thus appears that the panels with cable ties are suitable for holding a drop cable which can enter through opening 61 (fig. 3). The subject-matter of claim 1 thus apparently differs in that the spools are mounted on a moveable fiber storage panel. It appears obvious to mount the spools on a panel which can be removed to assist access, such as the panels in D1, D2, D3 ([0018]), D4 & D5. Hence the subject-matter of claim 1 lacks an inventive step.

- 5 Dependent claims 2-4, 11-14 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step in view of D1-D7. Reference is made to the passages cited in the International Search Report.



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[Continued on next page]

(54) Title: OPTICAL FIBER CABLE DROP INTERFACE BOX

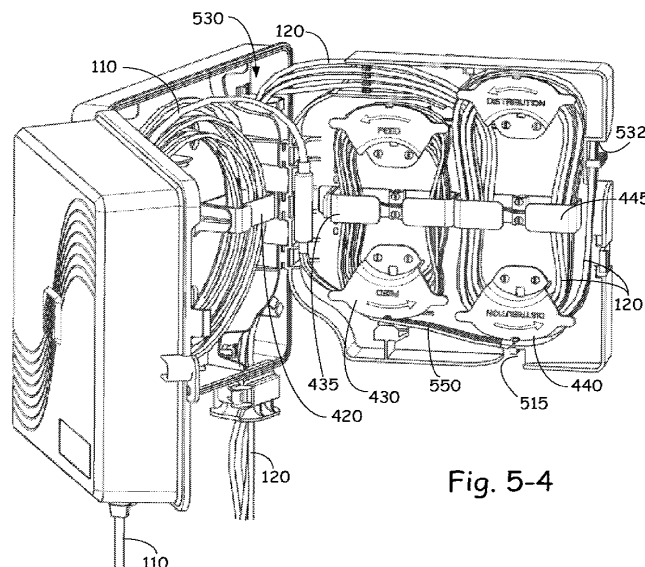


Fig. 5-4

(57) Abstract: Disclosed are exemplary embodiments of a drop interface box (DIB) (100) for interfacing between an optical network service provider's heavy jacketed drop cable (110) and optical distribution cables (120) at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel (405) includes spools (430; 440), cable clips (435; 445) and integrated cable channels (515; 532) that maintain cable radius during transitions of cables from a storage side or plane (415) of the panel to a connector side or plane (410) of the panel.



Published:

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OPTICAL FIBER CABLE DROP INTERFACE BOX

BACKGROUND

[0001] Disclosed embodiments relate to connection of an optical fiber feed or “drop” cable from an optical fiber service provider to a distribution point at a residence, dwelling or other building, such as a multi-unit dwelling. More particularly, disclosed embodiments relate to an enclosure for distribution of a passive optical fiber network. The enclosure will generally be mounted on a multi-dwelling residence, but can be mounted anywhere such distribution of a passive optical fiber network is desired to provide vertical, horizontal with one or multiple buildings in addition to providing building to building distribution using a variety of splice or termination options like ribbon splice or terminations.

[0002] Optical fiber is used in different delivery topologies to provide network access, for example internet access, to homes, businesses and other premises. Fiber to the x (FTTx) is a collective term for various optical fiber delivery topologies that are categorized according to where the fiber terminates. Optical fiber has commonly been used for long-distance parts of the network, but other communications media such as metal cabling has frequently been used in delivery to the customer premises. However, increasingly, optical fiber is being used to provide network access all of the way to the customer premises, and even within the customer premises.

[0003] Typically, a feed or drop optical fiber cable is provided to a premises, by an optical fiber service provider, from a larger distribution point or connection (e.g., a pole mounted distribution point). The feed is typically a heavy jacketed or hardened multi-fiber cable that is broken out at the premises into individual fiber connections. This is for example commonly the case at multi-dwelling residential buildings or at buildings that house multiple different businesses. Individual distribution fiber cables from inside each living or workplace unit are connected with adapters to the individual feed fiber optical cable connections from the multi-fiber drop cable.

[0004] Increasingly, optical fiber cables are pre-connectorized—that is they are shipped from a factory with terminating connectors already installed. This can lead to the need for installers to deal with excess optical fiber cable length in many instances. Other factors can also result in excess cable length. Storage of the excess cable length can be problematic, as can organization of the drop optical fiber cable, the multiple individual feed optical fiber cables, and the multiple individual distribution optical fiber cables which are connected to the

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individual living or workplace units. The fact that the various optical fiber cables are pre-connectorized provides other challenges when attempting to store or organize the cables. Also, there is a need to protect the optical fiber cables from excessive strain, as well as from damage due to bending the cables at too small of a bend radius.

[0005] The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter.

SUMMARY

[0006] Disclosed are exemplary embodiments of a drop interface box (DIB) for interfacing between an optical network service provider's heavy jacketed drop cable and optical distribution cables at a premises. The DIB provides organized drop, feed and distribution fiber cable storage and routing in a manner which does not cross different cables types when additional cables are added, and which maintains minimum bend radius of the cables and inhibits cable strain. In exemplary embodiments, a hinged fiber storage panel includes spools, cable clips and integrated cable channels that maintain cable radius during transitions of cables from a storage side or plane of the panel to a connector side or plane of the panel.

[0007] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a diagrammatic illustration of the use of a drop interface box (DIB) in accordance with disclosed embodiments.

[0009] Fig. 2-1 and 2-2 are perspective views of the DIB illustrated in Fig. 1.

[0010] Figs. 3-1 through 3-4 are illustrations of features of exemplary DIB embodiments which provide weather resistant seals, minimize strain on fiber cables, and prevent cable damage due to bending.

[0011] Figs. 4-1 and 4-2 are views of a base, cover and hinged fiber storage panel of a DIB in accordance with exemplary embodiments.

[0012] Figs. 5-1 through 5-3 are diagrammatic illustrations of drop, feed and distribution cable routing and storage in exemplary DIB embodiments.

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[0013] Fig. 5-4 is a view of an exemplary DIB showing drop, feed and distribution cable routed and stored as shown in Figs. 5-1 through 5-3.

[0014] Fig. 6-1 is a diagrammatic illustration of feed and distribution cable routing to a front side of the fiber storage panel in accordance with exemplary embodiments.

[0015] Figs. 6-2 and 6-3 are diagrammatic illustrations of distribution cable entrance features which provide weather resistant sealing and prevent cable damage due to bending.

[0016] Fig. 6-4 is a view of an exemplary DIB showing feed and distribution cable routing to the front side of the fiber storage panel in accordance with exemplary embodiments as shown in Fig. 6-1.

DETAILED DESCRIPTION

[0017] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms “mounted,” “connected,” “supported,” and “coupled” and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, “connected” and “coupled” are not restricted to physical or mechanical connections or couplings.

[0018] Disclosed embodiments include a drop interface box (DIB) which provides an easy to use and reliable solution to FTTx deployments using factory terminated optical cable assemblies. The disclosed DIB includes integrated slack storage compartments which provide ample room to store excess cable length while maintaining separation of hardened drop, feeder breakout, and distribution cables. This unique slack storage design allows for drop and distribution cables to be added quickly and easily as demand increases. Use of the disclosed DIB is not limited to use with these pre-connectorized optical cables

[0019] Referring now to Fig. 1, shown is a diagrammatic illustration of the use of DIB 100 in accordance with exemplary embodiments. DIB 100 mounts at a desired location of a premises 130, which will typically be a multi-dwelling or multi-business type of premises in

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which multiple individual living spaces or units are included in a single larger building. However, DIB 100 is not limited to use in this type of premises. DIB 100 is configured to receive and partially house a hardened “drop” cable 110 from an optical fiber service provider distribution point 105, which can be, for example, a pole mounted box connected to the provider’s network. Inside of DIB 100, drop cable 110 is split into feeder breakout cables 550 (shown in Fig. 5-4) and converted into multiple distribution cables 120 which are connected in or to the individual units or locations 125 of premises 130. DIB 100 has numerous features, described below in detail, which aid in the organization and storage of the various cables, including pre-connectorized cables.

[0020] Referring now to Figs. 2-1 and 2-2, shown are side and front perspective views of DIB 100 in accordance with an exemplary embodiment. As shown in these Figs., DIB 100 includes a base unit 205 and a door or cover 210 which has a hinged connection to the base unit. A push to close cover latch 215 secures cover 210 to base unit 205 in a closed position, and a security screw housing 220 is formed with or in cover 210 and is configured to receive a security screw 222 for denying entry into DIB 100 to persons without a proper tool. For instance, in an exemplary embodiment, security screw 222 is a 3/8 inch security screw which is configured to be used with a “216 tool” of the type which is well known in the art. For further security, a padlock hasp 225 is also included in an exemplary embodiment for receiving a padlock (not shown) to lock cover 210 to base unit 205 in a closed position. In one exemplary embodiment, padlock hasp 225 can be integrally formed with the material of cover 210 and base unit 205. For example, in an exemplary embodiment cover 210, base unit 205 and the above-described components (not including security screw 222) are formed of a plastic material. In other embodiments, hasp 225 and/or other components are formed of other materials (e.g., metals) which are attached to cover 210 and/or base unit 205.

[0021] DIB 100 includes features which enable the entry of pre-connectorized cables (e.g., cables 110 and/or 120) into the DIB by an installer. A drop cable entrance 206 is configured to receive a drop cable from an optical service provider. Many conventional enclosures require cable to be fed through slots or apertures of a size which cannot accommodate pre-connectorized cables, but DIB 100 utilizes unique features to accommodate pre-connectorized cables. Yet other features of DIB 100 help to prevent damage to cables due to strain or bending. Both features that facilitate the use of pre-connectorized cables, and features that prevent strain or bending damage to the cables, are illustrated in detail in Figs. 3-1 through 3-4.

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[0022] Shown in Fig. 3-1 is a bend limiting cable boot 305 which is formed in a flexible molded clam-shell design to allow the boot to be installed over the pre-connectorized drop cable 110 without having to feed the cable through the boot. The boot 305 has a central channel 309 in which cable 110 is positioned when the two portions of the boot are closed together. Slots 307 are formed in the boot 305 so that the boot is secured to the cable 110 and to a cable clamp bracket (shown in Fig. 3-2) using standard cable ties 311, commonly available to installers. The flexible material, for example rubber, and tapered shape of boot 305 supports the cable 110, preventing a sharp bend in the cable at the edge of the strain-relief clamp 320 (shown in Fig. 3-2) when the cable 110 is pulled in any direction.

[0023] Referring now more particularly to Figs. 3-2 and 3-3, shown are components of a strain-relief cable clamp 320 which comprises a mounting bracket 325 and rigid clamp block 330 that engages the cable jacket of cable 110 in order to retain the cable position when axial force is applied to the cable. One or more threaded fasteners 331 provide a mechanical advantage while engaging the clamp block 330 and cable jacket. The position of the threaded fastener 331 and the shape of the clamp block 330 provide limited access to the general public while allowing the installer to use a “216 wrench”, commonly available to telcom installers. In exemplary embodiments, during factory assembly of the clamp components, the treaded fastener 331 is deformed to prevent clamp components from being separated during field operation. This prevents dropping or losing the components during operation. As is seen in the illustration of Fig. 3-3 which shows clamp block 330 isolated and from a bottom perspective view, the rigid clamp block has ribs/ridges 332 in the cable channels 334 to help keep the cable from slipping when clamped onto the drop cable 110.

[0024] Referring now to Fig. 3-4, shown is a weather proof or weather resistant cable entrance clip feature of DIB 100 in accordance with an exemplary embodiment. In the illustrated exemplary embodiment, cable clips 340 are of a rigid clam shell design to clip over the cable 110 without feeding the cable through. The clips 340 slide into flanges or slots 345 inside of the base 205 in an area adjacent to relief cable clamp, which is outside of base 205, to create a substantially weather tight seal between the clips 340 and base 205 of DIB 100. Closed cell foam gaskets 350 create a weather tight seal between the clips and cable jacket.

[0025] Referring next to Figs. 4-1 and 4-2, shown are the multiple storage compartments or features. As shown, base unit 205 has a hinged connection 401 to cover 210. A fiber storage panel 405 also has a hinged connection 406 to an opposing side of base unit 205. The hinged fiber storage panel 405 has a first or front side 410 (shown in Fig. 4-2) and a second

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or rear side 415 (shown in Fig. 4-1), both having unique features which aid in providing storage and organization of the various cables described above.

[0026] Base unit 205 includes drop cable storage clips 420. The drop feed cable 110, which enters DIB 100 above the position of strain-relief cable clamp 320 as described above, is fed around the storage clips 420 and stored in the base unit 205 of the DIB. On the rear side 415 of the hinged fiber storage panel 405, there are two sets of spools 430 and 440 and two sets of corresponding storage clips 435 and 445. Spools 430 and storage clips 435 store feed cables 550 (shown in Fig. 5-4). Spools 440 and clips 445 store distribution cables 120. A break-out or furcation plug 450 positioned near the upper end of hinged connection 406 divides the drop feed cable 110 into multiple (e.g., typically four) individual feed cables 550.

[0027] On the front side 410 of hinged fiber storage panel 405 is an adapter bracket 460 which holds one or more connectors or adapters 465, such as four-to-eight port adapters. Adapters 465 convert between the feed cables 550 and the distribution cables 120. The connectors or adapters 465 are standard components used in the telecommunications industry for converting optical fiber signals between feed cables and distribution cables. However, positioning adapters 465 on the front side of hinged panel 405, and in an exemplary embodiment at a center location on the front side of the hinged panel opposite the storage spools and clips positioned on the rear side of the panel, allows for routing of both of the feed cables and the distribution cables while maintaining proper bend radius. Hinged storage panel 405 and DIB include further features, which are described below with reference to Figs. 5-1 through 5-4 and 6-1 through 6-4, that aid in routing and storage of these cables while maintaining a proper bend radius.

[0028] Referring now to Fig. 5-1, shown are mechanisms for, and a method of, storing the feeder cable with outdoor jacket, namely drop cable 110. The above-mentioned cable storage clips 420 are situated in the base 205 to retain coils of the outdoor jacketed feeder cable without unnecessary stress on the cable or violating minimum bend radius. Using storage clips 420, the cable 110 is coiled in the direction as shown at arrows 505 in accordance with the preferential bend axis or radius for the particular cable type.

[0029] Referring now to Fig. 5-2, shown is arrow 510 representing the routing of cable 110 from base 205 to the rear side 415 of hinged fiber storage panel 405. As discussed above, panel 405 is hinged to provide convenient access to both sides of the panel. The pairs of cable storage spools 430 and 440 and corresponding cable storage clips 435 and 445, as well as routing channels 515 and 532 through which cables transition between the front and rear of

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panel 405, are positioned and designed to (1) maintain separation of cable storage between the feed cables (stored on spools 430 and clips 435) and the distribution cables 120 (stored on spools 440 and clips 445); (2) support the manufacturer's specified minimum bend radius for the cables; and (3) allow cables to be added after the initial installation without cross-over of cable types. The feeder cable breakout adapter storage area is located on the panel 405 nearest the hinge axis 406 and aligned with the hinge axis to allow easy transition of the drop cable 110 from the storage in the base 205 to the panel 405. The proximity and alignment to the hinge also allows the panel to be operated (open and closed) without excessive stress to the cable transition. The feeder breakout cable storage clips 435 are located in parallel to the breakout adapter storage 450 (see Fig. 4-1) to provide a convenient transition and to maintain minimum bend radius. The feeder break-out cables 550 are routed and stored on spools 430 and clips 435 as represented by arrows 512 shown in Fig. 5-3. As described above the fiber storage panel 405 also incorporates an integrated cable channel 515 that maintains cable radius while transitioning the feeder cables from the storage clips 435 on the back 415 of the panel to the connectors 465 on the front 410 of the panel. Arrow 516 represents the transition of cables 550 into channel 515.

[0030] Referring now more particularly to Fig. 5-3, shown is an integrated cable channel 530 in base 205. Integrated cable channel 530 is positioned parallel to the panel hinge 406 and located to the side edge of base 205 to allow the distribution cable 120 to be routed from the distribution cable entrance 535 to the top of the base and onto the panel 405 through opening 540 without cross-over of the other cable types. Arrow 531 represents the routing of distribution cables 120 from channel 530 onto panel 405. The location of the cable clips 445 and cable channel 532 on the back side 415 of the panel allows the distribution cable 120 to transition from the backside 415 of panel 405 to the front side 410 of panel 405 without causing unnecessary stress or bending during panel movement or operation. The distribution cable storage clips 445 are oriented to provide a convenient transition and to maintain minimum bend radius. Arrows 514 represent the routing and storage of distribution cables 120 on spools 440 and clips 445. The integrated channel 532 on fiber storage panel 405 transitions the distribution cables 120 from the storage clips 445 on the rear side 415 to the adapters or connectors on the front 410 of the pane while maintaining an acceptable cable radius. Arrow 518 represents the transition into channel 532.

[0031] Referring now to Fig. 5-4, DIB 100 is shown with drop cable 110, feed cables 550 and distribution cables 120 routed and stored as described above.

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[0032] Referring now to Fig. 6-1, shown is panel 405 folded into base unit 205 for storage such that front side 410 of the panel is shown. The adapters or termination connectors 465 discussed above are shown on the front 410 of the panel oriented with respect to the cable channels 515 and 532 to maintain the necessary minimum bend radius during cable installation. Arrows 610 represent the routing of feed cables 550 on the front of panel 405, while arrows 620 represent the routing of distribution cables 120 on the same side. Channels 515 and 532 provide the transitions for these respective cables between the front and rear sides of the panel. Cable routing clips 612 attached to, or formed integrally with, panel 405 are also used to secure cables 120 and 550 to front side 410 of the panel in proper positions to maintain the acceptable bend radius specified by the cable manufacturer.

[0033] Referring now to Fig. 6-2, shown is the pre-connectorized distribution cable entry point 535 for distribution cable 120 in both open (right) and closed (left) positions. This entry point 535 includes an integrated cable grommet cavity 650 with bend limiting flange 645. An integrated portion of the enclosure base 205 provides the flange 645 and forms a cavity 650 to retain and compress the cable grommet 660 to provide a seal between the grommet, base 205, and cables 120. An integrated hinge 665 and latching system 670 are also provided for the cable entry cover portion 675. The integrated radius flange 645 limits the cable bend when pulled in any direction.

[0034] In an exemplary embodiment, the hinged cable entry cover 675 also includes a bend limiting flange 677. The cover 675 is in some embodiments a rigid cover that hinges on the grommet cavity 650. Opening the cover allows the grommet 660 to be removed, and when closed the cover 675 retains and compresses the grommet to provide a seal between the cover, grommet, base, and cables.

[0035] An example embodiment of a weather resistant pre-connectorized cable grommet 660 is shown in Fig. 6-3. Grommet 660 is, in exemplary embodiments, made of a flexible material such as rubber that will compress and seal against the base, cover and cables. The grommet employs cable ports comprising of thin slices though the material from the perimeter of the grommet towards the center. Near the center, the thin slices form a partial circle. These partial circle slugs can be peeled out to create a cavity for the cable. The radial slices protruding to the perimeter of the grommet can be spread open and a cable inserted without having to thread the cable end through the grommet.

[0036] Referring now to Fig. 6-4, DIB 100 is shown in its folded position (with front 410 of panel 405 shown facing out as the panel is stored in the base) with drop cable 110, feed

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cables 550 and distribution cables 120 routed and stored as described above, including the transition channels 515 and 532 as well as the cable adapters or connectors 465 positioned approximately at the center of panel 405.

[0037] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims. For example, in various embodiments, the DIB can be made from materials other than plastic. Further, the various components can be arranged in different ways than those specifically illustrated. Other examples of modifications of the disclosed concepts are also possible, without departing from the scope of the disclosed concepts.

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WHAT IS CLAIMED IS:

1. A drop interface box (100) configured to be mounted to a structure and to receive a drop cable (110) from an optical fiber service provider distribution point and a plurality of distribution cables (120) which distribute the optical fiber service, the drop interface box comprising:
 - a base unit (205) having a drop cable entrance (206) configured to receive the drop cable (110) and having drop cable retaining mechanisms (420) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;
 - a cover (210) having a hinged connection (401) to the base unit to selectively enclose a storage area provided in the base unit; and
 - a fiber storage panel (405) moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools (430) positioned to store a plurality of feed break-out cables (550) coupleable to the drop cable, the fiber storage panel further having second spools (440) positioned to store a plurality of distribution cables (120) coupleable to the plurality of feed break-out cables.
2. The drop interface box of claim 1, wherein the fiber storage panel includes a hinged connection (406) to the base unit on a side opposite the hinged connection of the cover to the base unit.
3. The drop interface box of claim 1, wherein the fiber storage panel further includes an adapter bracket (460) configured to hold one or more adapters (465) which couple the plurality of feed break-out cables to the plurality of distribution cables.
4. The drop interface box of claim 3, wherein the adapter bracket is positioned on a first side (410) of the fiber storage panel, and the first spools and second spools are positioned on a second side (415) of the fiber storage panel.
5. The drop interface box of claim 4, and wherein the fiber storage panel further includes a first set of cable storage clips (435) positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips (445) positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

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6. The drop interface box of claim 4, wherein the fiber storage panel further comprises a first routing channel (515) and a second routing channel (532), the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

7. The drop interface box of claim 6, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

8. The drop interface box of claim 6, wherein the base unit further comprises a cable channel (530) formed substantially parallel to the hinged connection of the fiber storage panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance (535) at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

9. The drop interface box of claim 8, wherein the distribution cable entrance includes a cable grommet cavity (650) and a bend limiting flange (645).

10. The drop interface box of claim 9, and further comprising a cable grommet (660) retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

11. The drop interface box of claim 1, wherein the drop cable retaining mechanisms (420) in the base unit comprise storage clips positioned on opposing sides of the base unit.

12. The drop interface box of claim 1, wherein the drop cable entrance further comprises slots (345) formed in the base unit and configured to receive a cable clip (340) which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit.

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13. The drop interface box of claim 12, and further comprising a strain-relief clamp (320) coupled to the base unit proximate the drop cable entrance.
14. The drop interface box of claim 1, and further comprising a security mechanism (220 or 225) for securing the cover to the base unit in a closed position.

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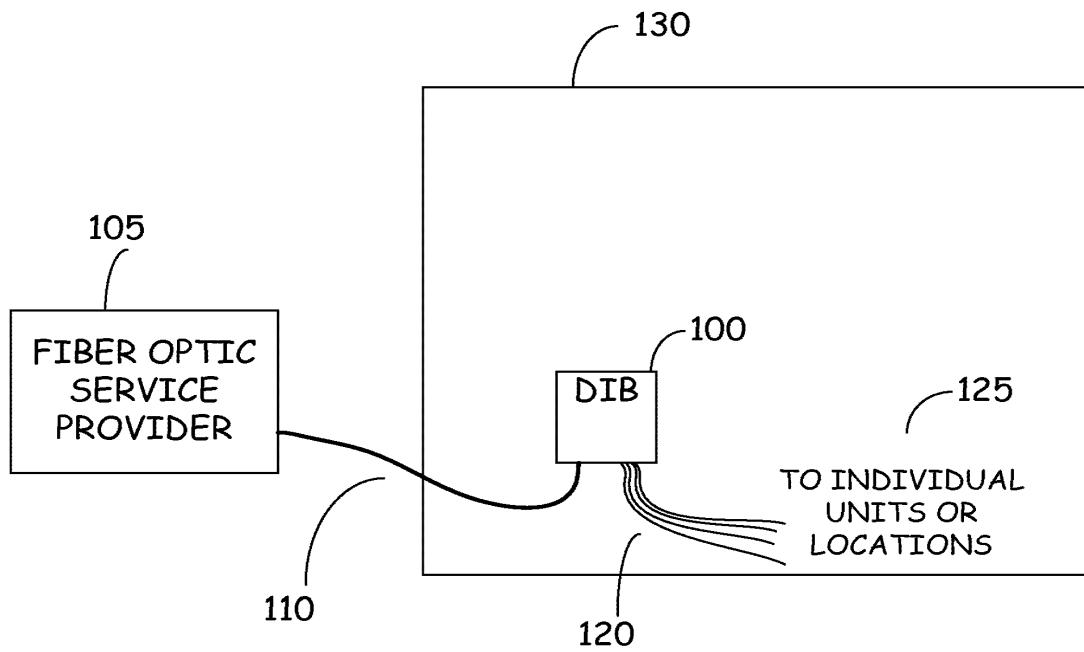


Fig. 1

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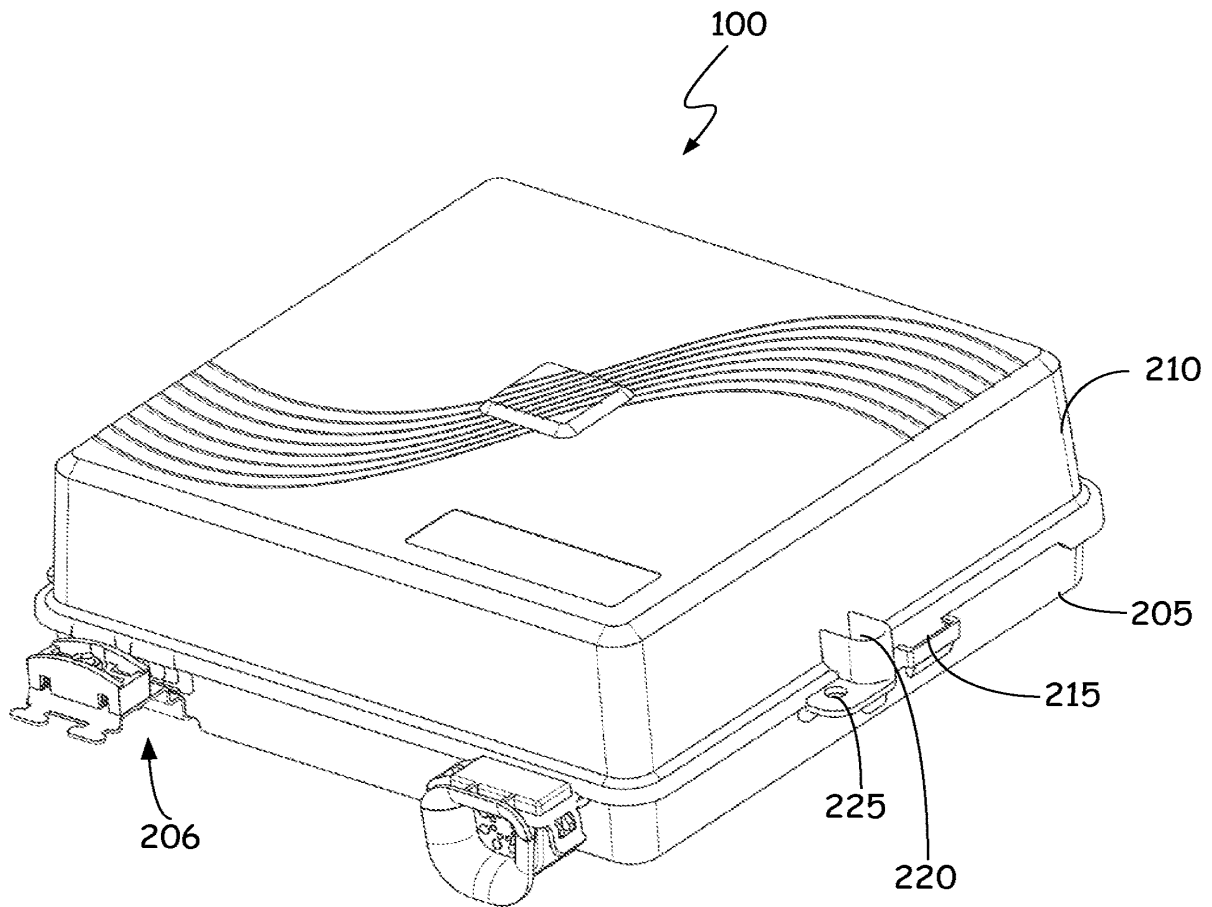


Fig. 2-1

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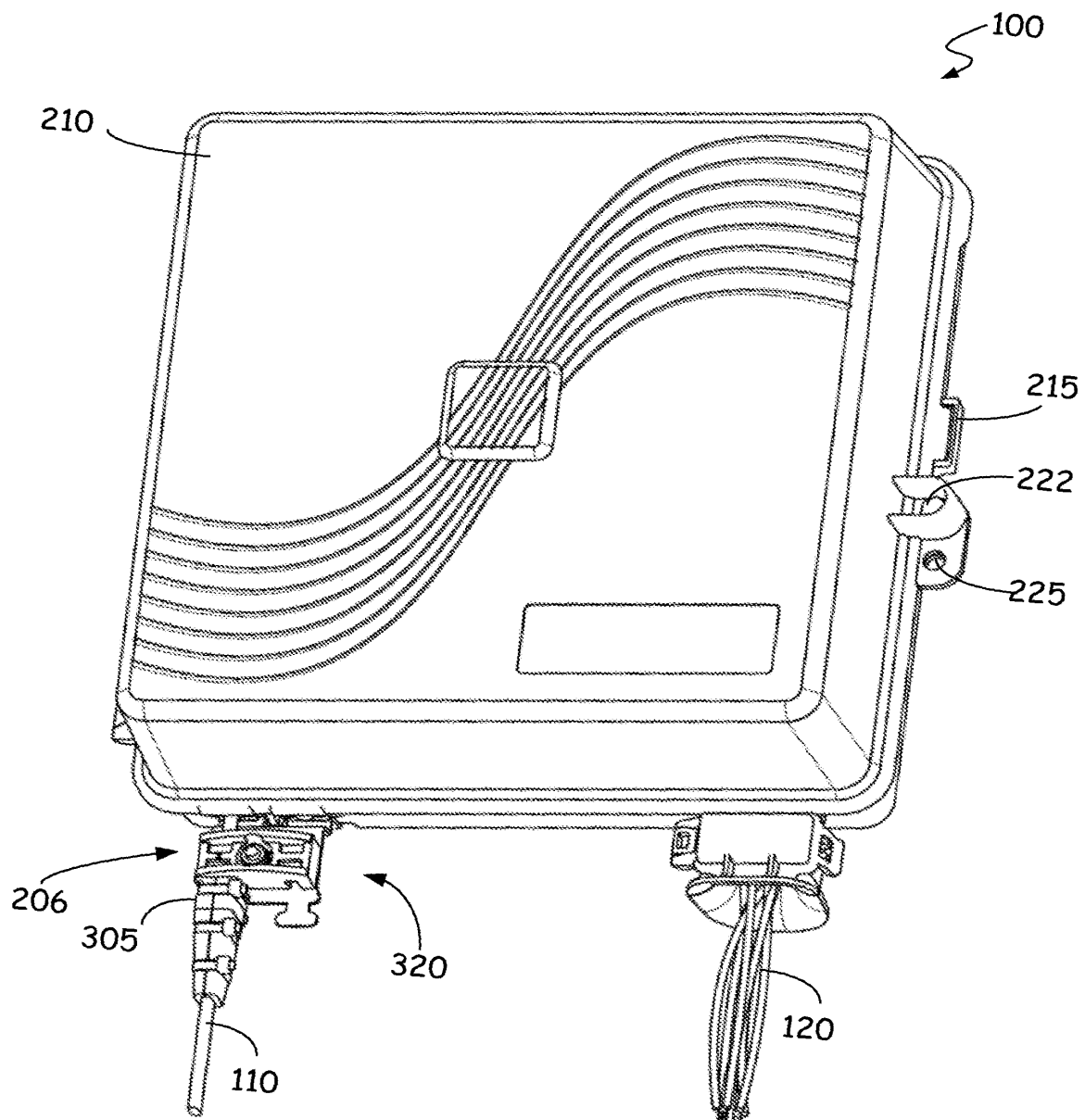


Fig. 2-2

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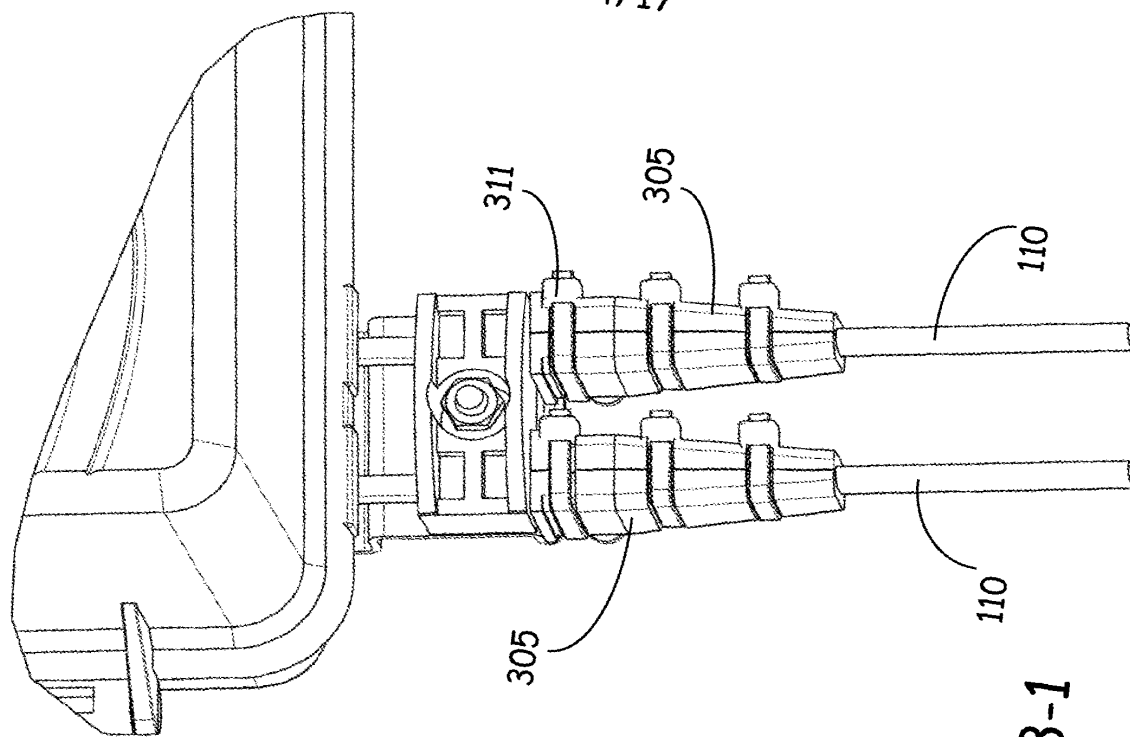
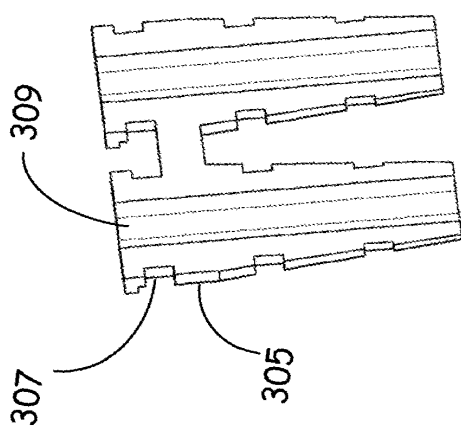


Fig. 3-1



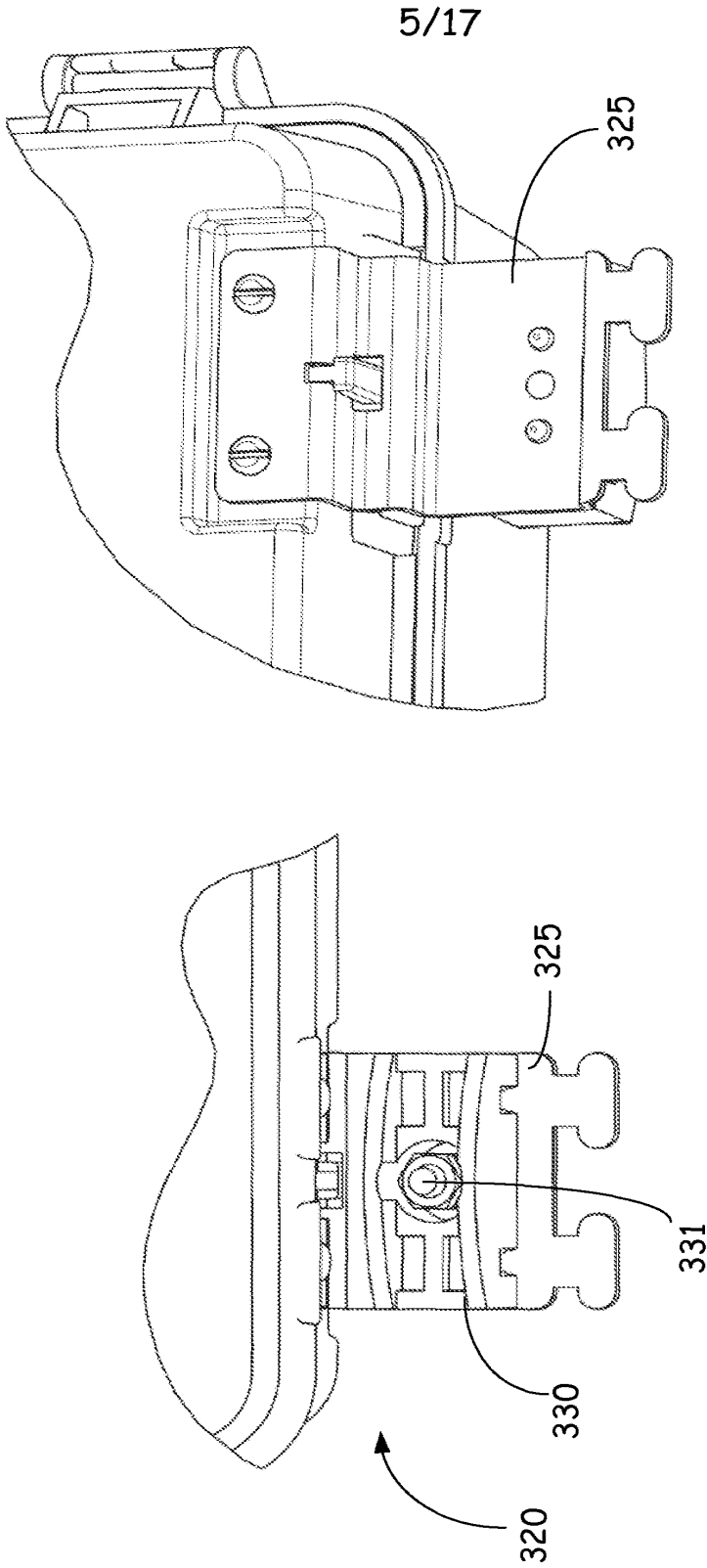


Fig. 3-2

6/17

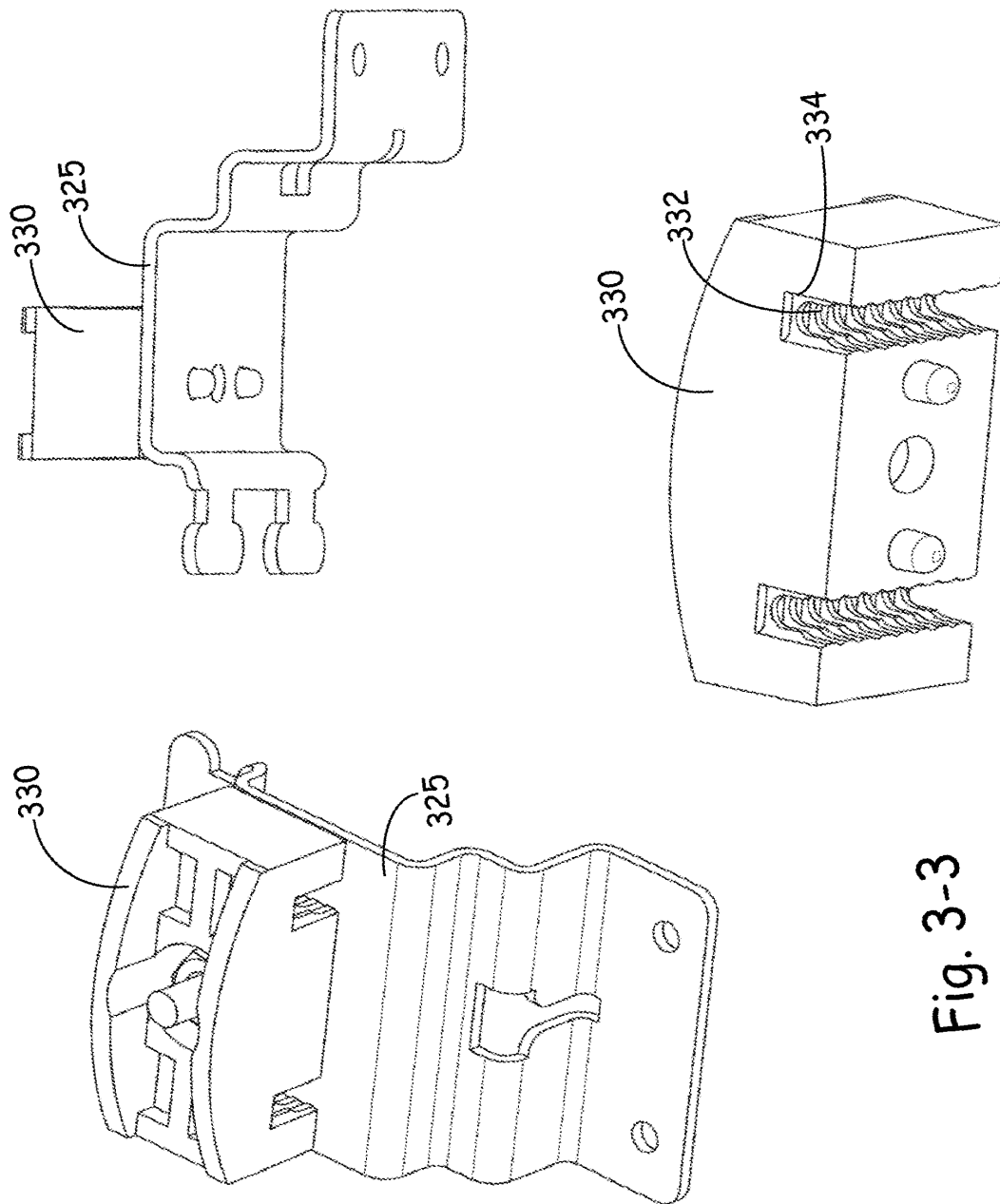


Fig. 3-3

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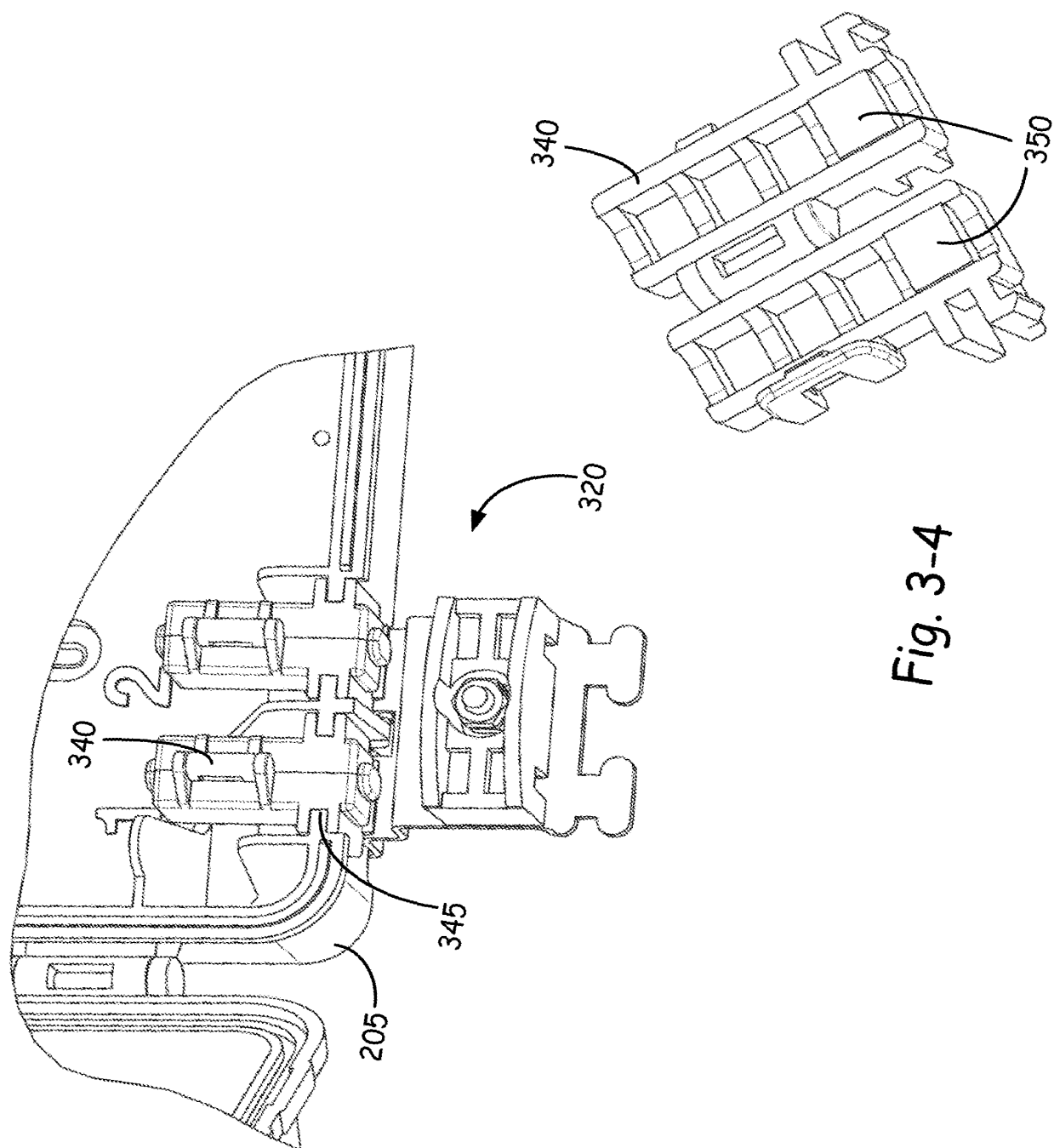


Fig. 3-4

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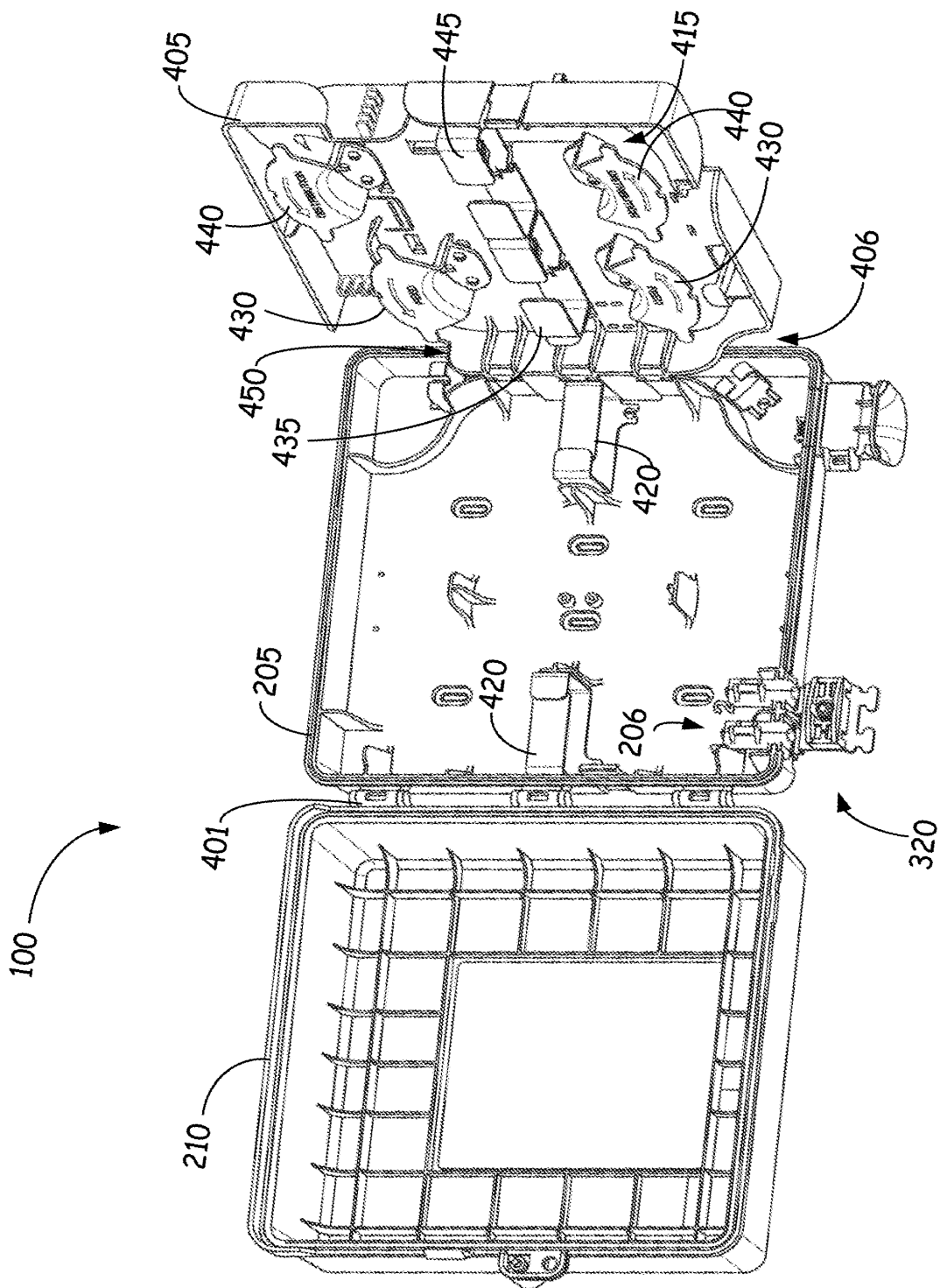


Fig. 4-1

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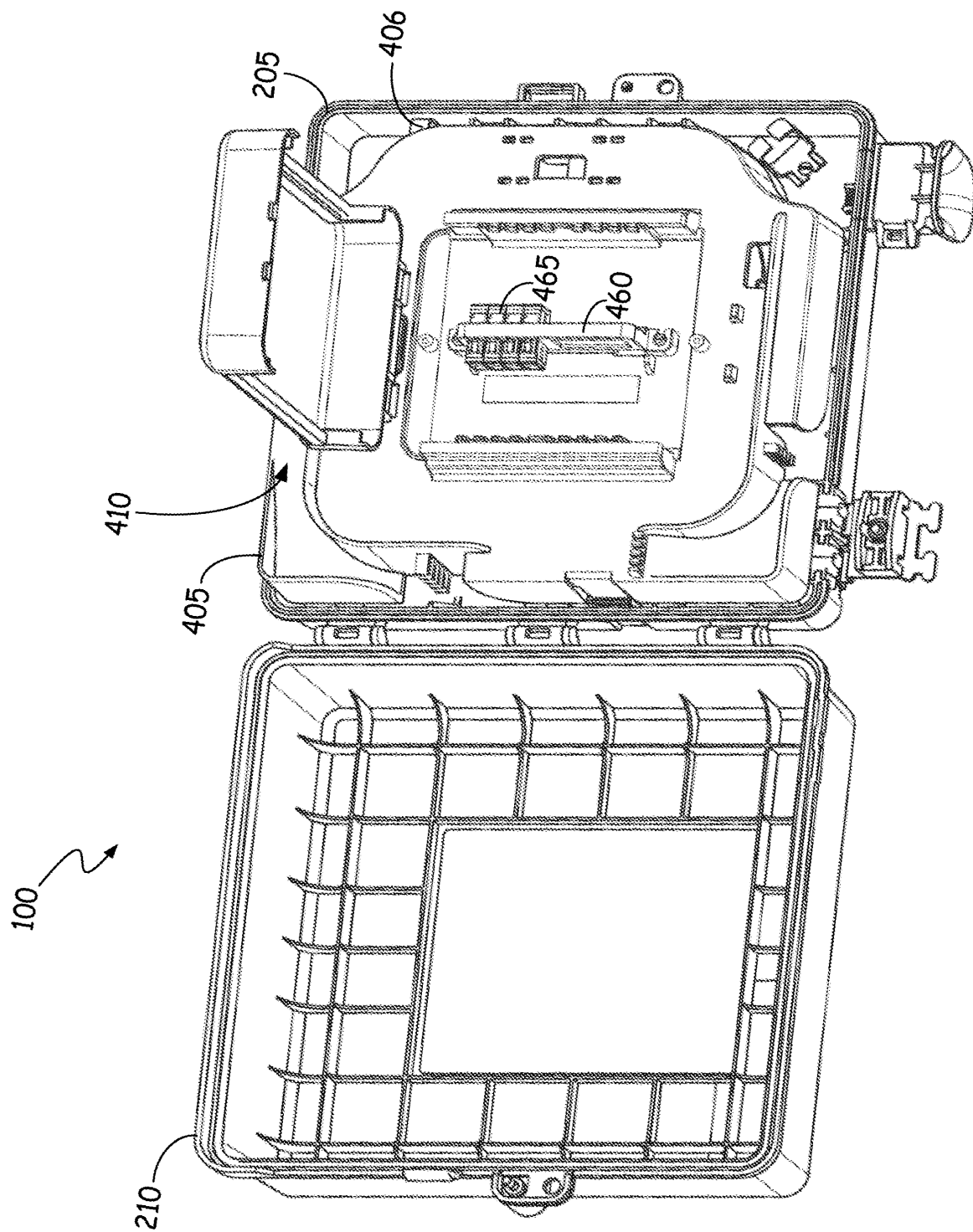


Fig. 4-2

10/17

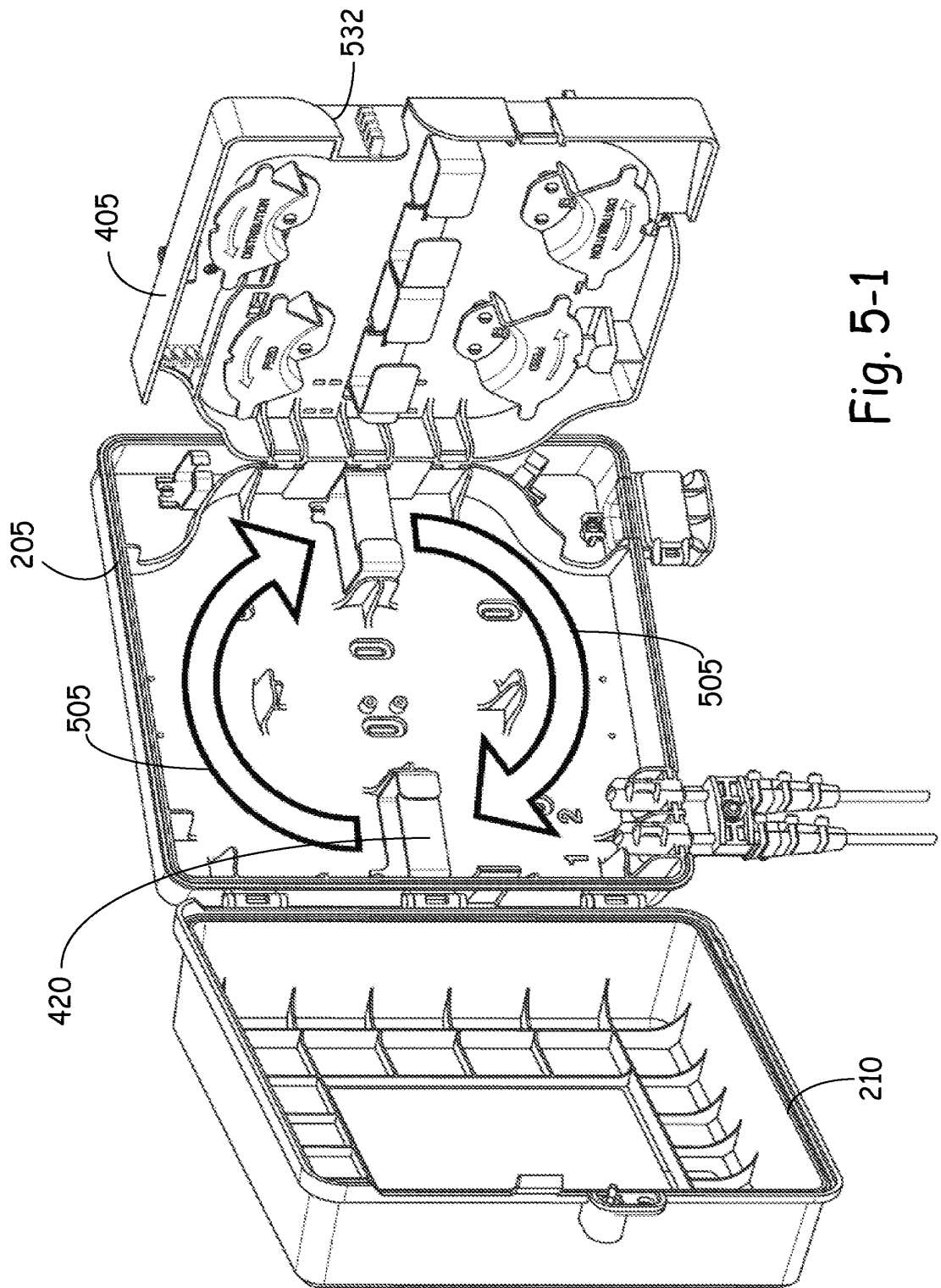


Fig. 5-1

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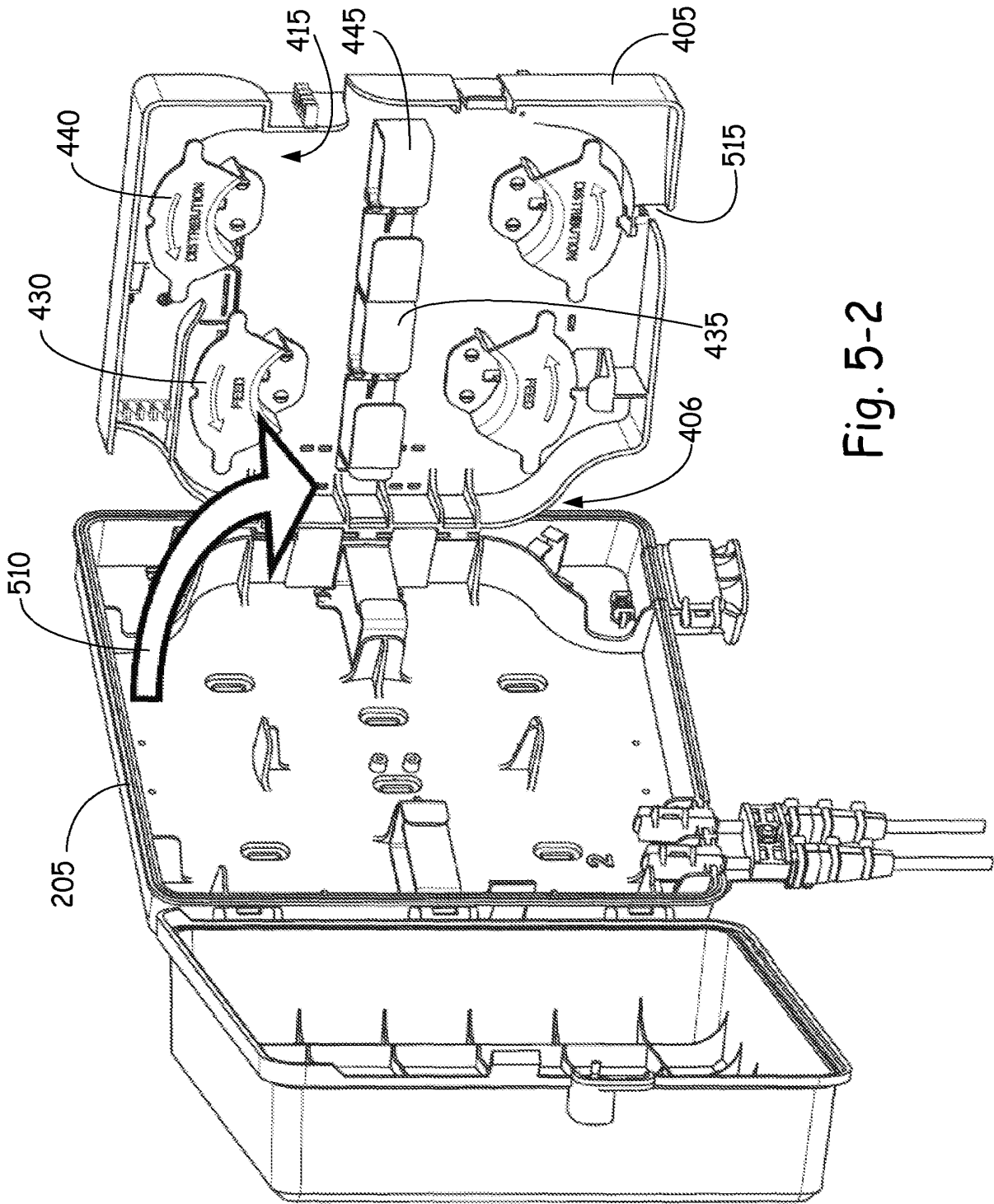


Fig. 5-2

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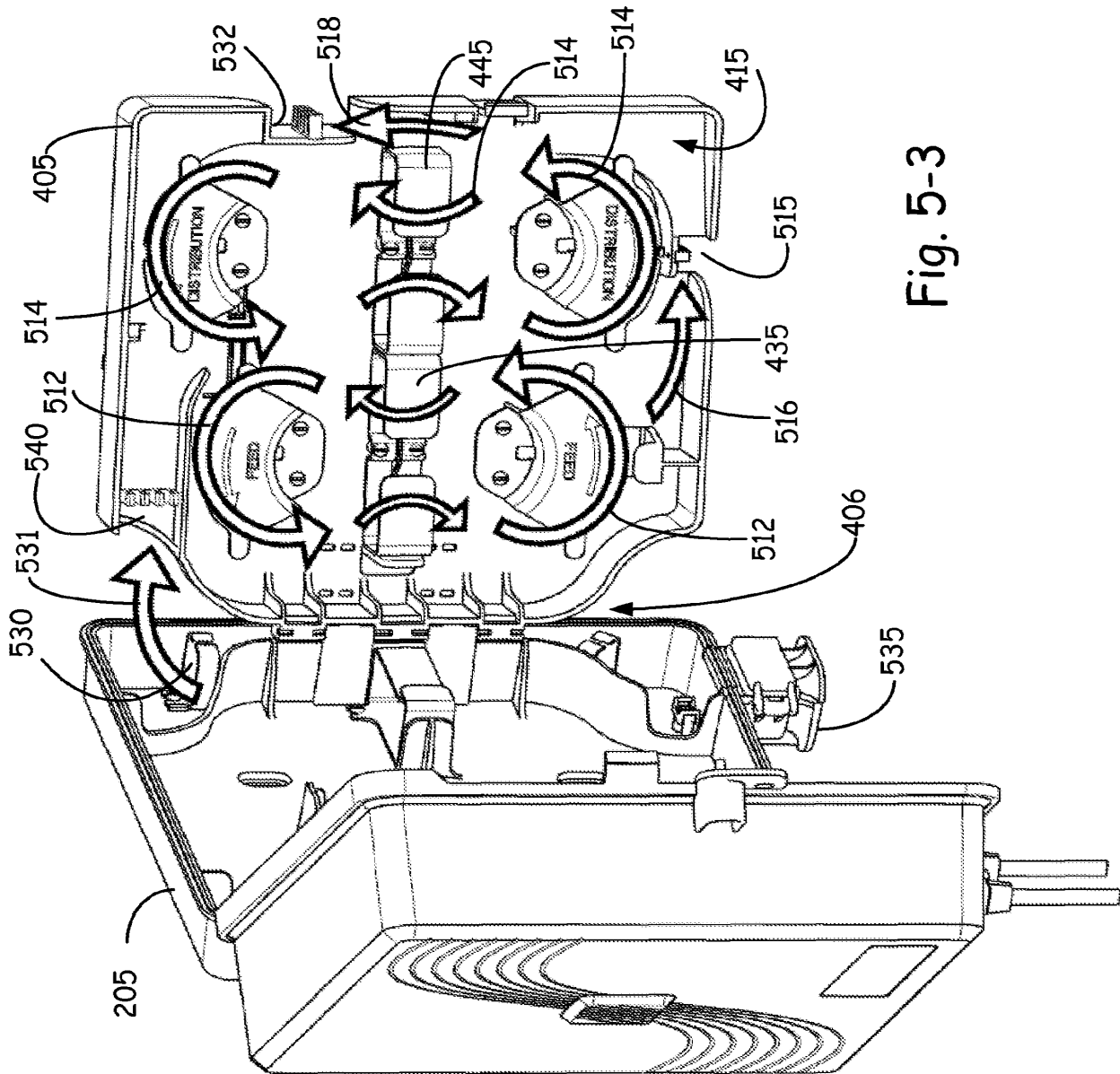
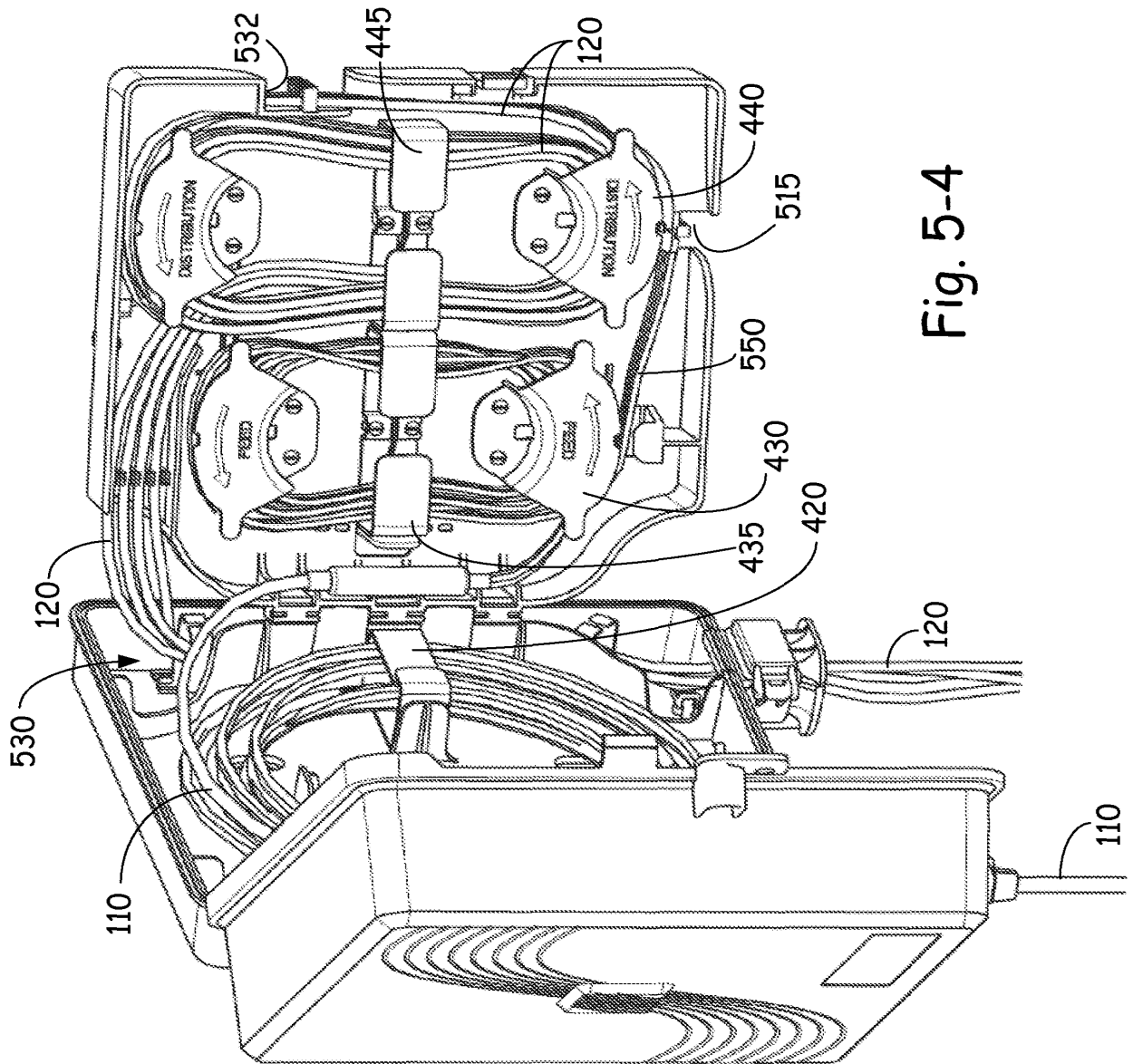


Fig. 5-3

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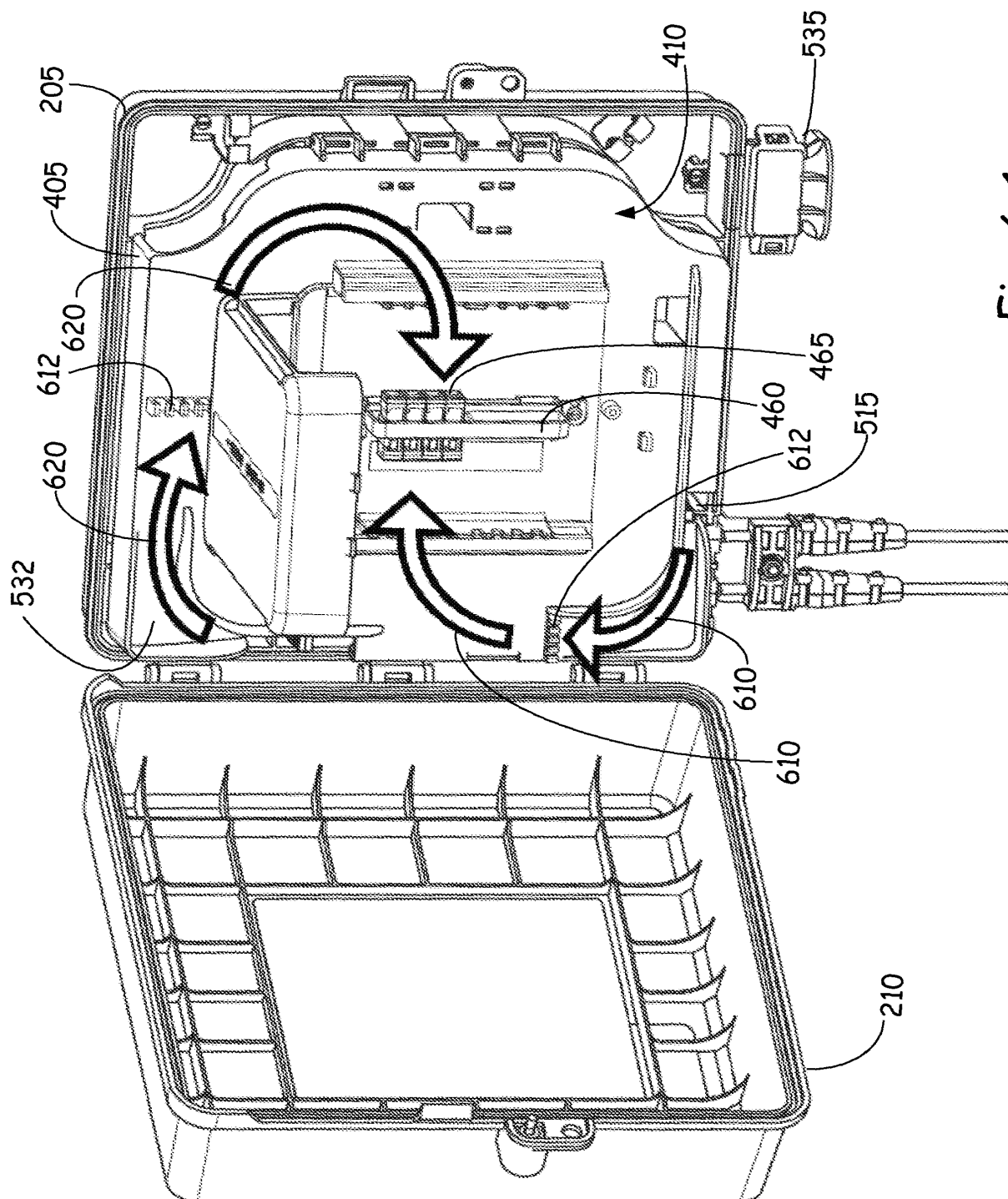
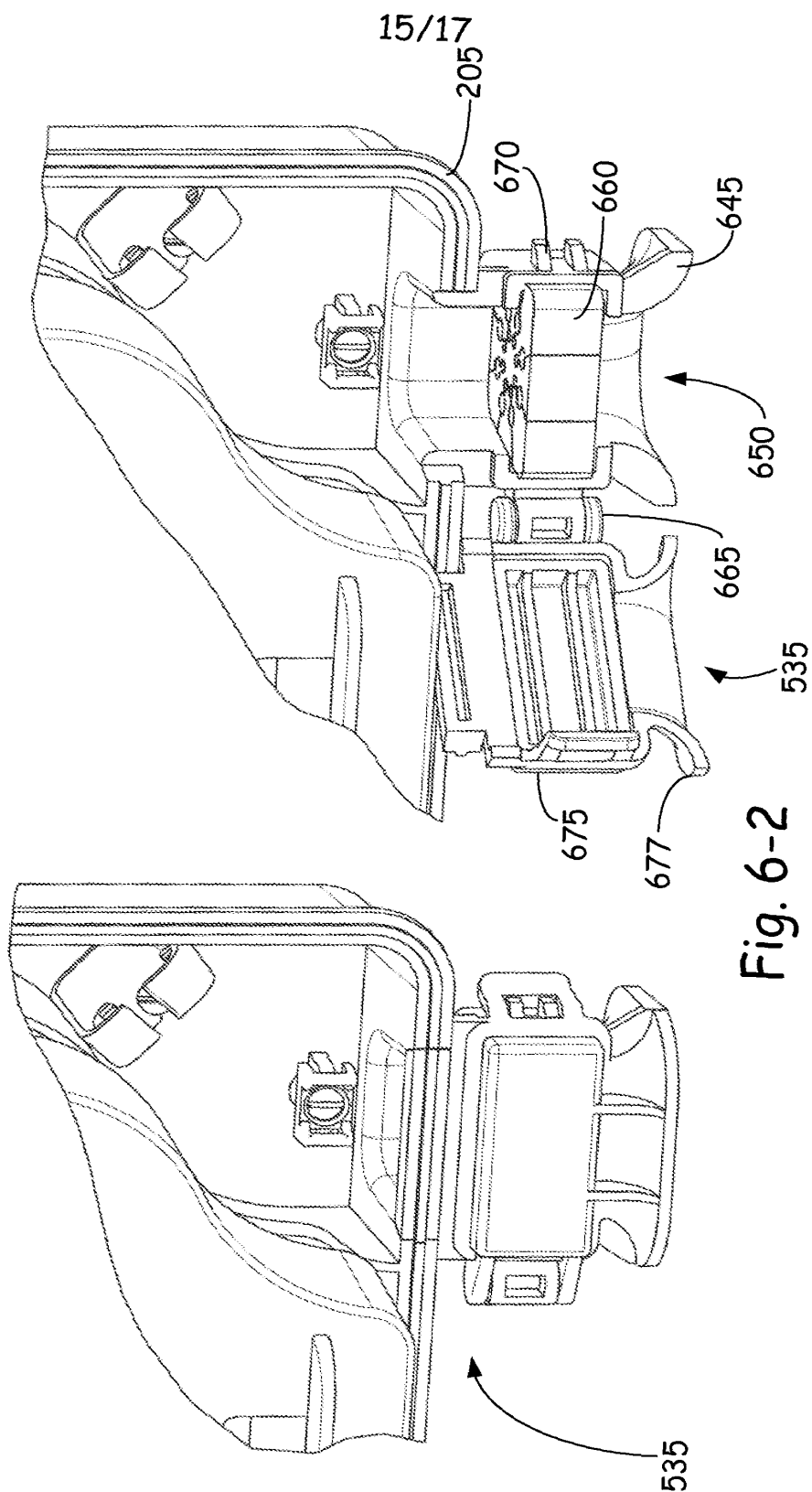


Fig. 6-1



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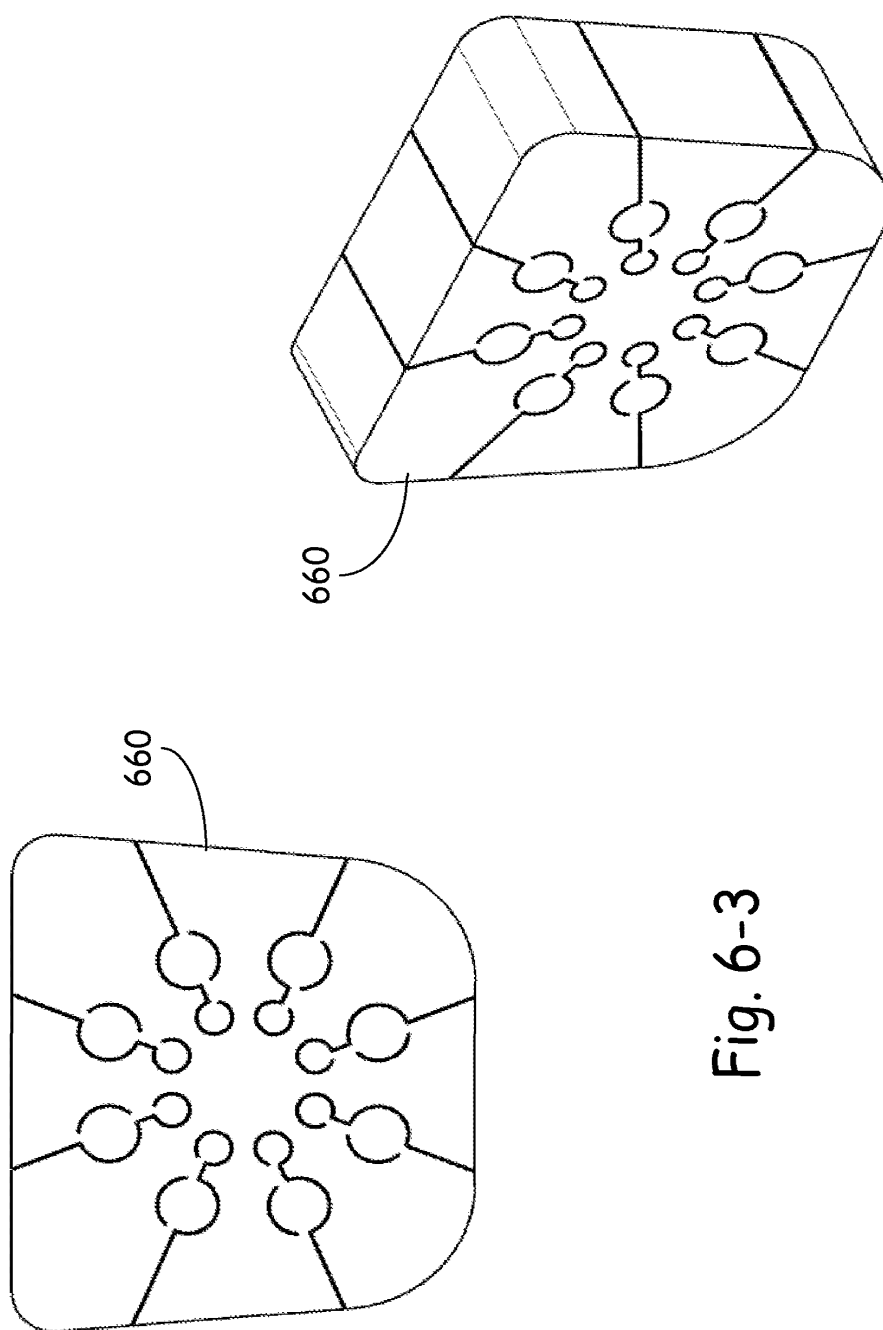


Fig. 6-3

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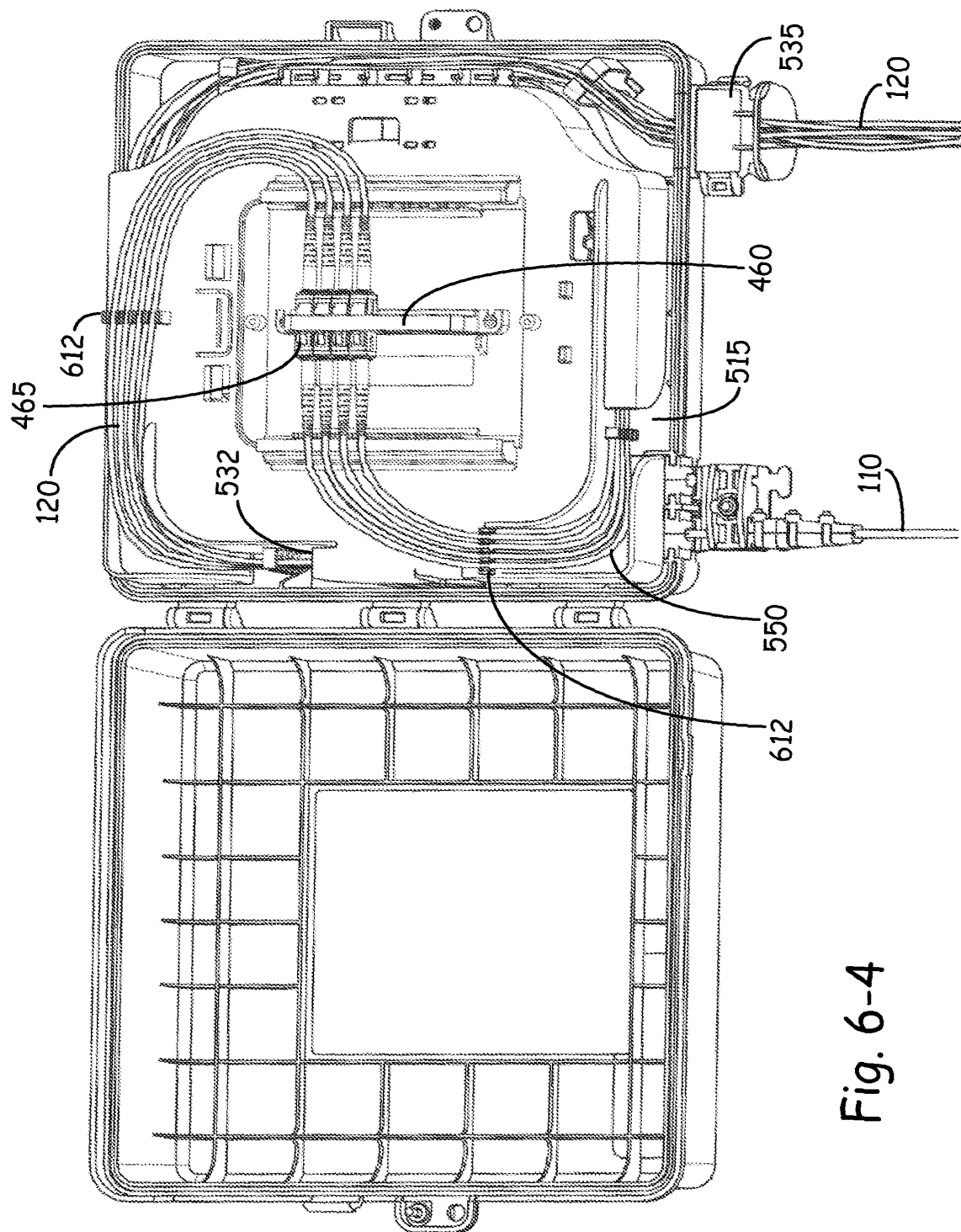


Fig. 6-4

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032320

A. CLASSIFICATION OF SUBJECT MATTER
INV. G02B6/44
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2009 109729 A (NITTO ELECTRIC WORKS LTD) 21 May 2009 (2009-05-21) abstract; figures 1-10 -----	1, 11
X	US 2007/086721 A1 (DOBBINS PATRICK E [US] ET AL) 19 April 2007 (2007-04-19) paragraphs [0030], [0036], [0044], [0048]; figures 1-7 -----	1, 2, 11-14
X	US 2003/103750 A1 (LAPORTE RICHARD B [US] ET AL) 5 June 2003 (2003-06-05) paragraph [0024]; figures 1-3, 6 -----	1-4, 12-14
X	US 2009/202214 A1 (HOLMBERG MATTHEW [US] ET AL) 13 August 2009 (2009-08-13) paragraphs [0045], [0051] - [0053]; figures 6-11 ----- -/--	1, 11

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

☒ See patent family annex.

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Date of the actual completion of the international search

21 June 2012

Date of mailing of the international search report

03/07/2012

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Ciarrocca, Marco

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032320

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE WPI Week 200658 Thomson Scientific, London, GB; AN 2006-562752 XP002678329, -& JP 2006 195498 A (NIPPON TELEGRAPH & TELEPHONE CORP) 27 July 2006 (2006-07-27) abstract; figures 1-6 -& DATABASE EPODOC [Online] EUROPEAN PATENT OFFICE, THE HAGUE, NL; 27 July 2006 (2006-07-27), "OPTICAL CABLE CONNECTION BOX", XP002678330, Database accession no. JP-2006117485-A -----</p>	1
X	<p>US 5 109 467 A (HOGAN JOSEPH R [US] ET AL) 28 April 1992 (1992-04-28) column 3, lines 2-27; figures 2-4 -----</p>	1,3,12, 14
A	<p>US 2004/062508 A1 (BLANKENSHIP AARON I [US] ET AL) 1 April 2004 (2004-04-01) abstract; figures 1-6 paragraph [0012] -----</p>	1,3,11, 12,14

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

page 2 of 2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/032320

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2009109729 A	21-05-2009	JP 4883710 B2 JP 2009109729 A	22-02-2012 21-05-2009
US 2007086721 A1	19-04-2007	US 2007086721 A1 WO 2007011754 A2	19-04-2007 25-01-2007
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US 2009202214 A1	13-08-2009	US 2009202214 A1 WO 2009076536 A1	13-08-2009 18-06-2009
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US 2004062508 A1	01-04-2004	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/009,955	10/04/2013		740	C64.12-0053	14	1

CONFIRMATION NO. 5445

27367
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

FILING RECEIPT



0000000064380386

Date Mailed: 10/16/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

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Andrew E. Swienton, Plymouth, MN;
George I. Wakileh, Batavia, IL;

Applicant(s)

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Andrew E. Swienton, Plymouth, MN;
George I. Wakileh, Batavia, IL;

Power of Attorney: The patent practitioners associated with Customer Number 27367

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US2012/032320 04/05/2012
which claims benefit of 61/472,008 04/05/2011

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/009,955**

Projected Publication Date: 01/23/2014

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

OPTICAL FIBER CABLE DROP INTERFACE BOX

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
14/009,955	Nicholas B. Larsson	C64.12-0053
27367 WESTMAN CHAMPLIN & KOEHLER, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402		INTERNATIONAL APPLICATION NO. PCT/US2012/032320
		I.A. FILING DATE 04/05/2012
		PRIORITY DATE 04/05/2011

CONFIRMATION NO. 5445
371 ACCEPTANCE LETTER



OC00000064380387

Date Mailed: 10/16/2013

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

<u>10/04/2013</u>	<u>10/04/2013</u>
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363). Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 10/04/2013
- Copy of the International Search Report filed on 10/04/2013
- Preliminary Amendments filed on 10/04/2013
- Information Disclosure Statements filed on 10/04/2013
- Oath or Declaration filed on 10/04/2013
- Request for Immediate Examination filed on 10/04/2013
- U.S. Basic National Fees filed on 10/04/2013
- Priority Documents filed on 10/04/2013
- Specification filed on 10/04/2013
- Claims filed on 10/04/2013
- Abstracts filed on 10/04/2013
- Drawings filed on 10/04/2013
- Authorization to Permit Access filed on 10/04/2013

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

VONDA M WALLACE

Telephone: (571) 272-3734

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 14/009,955				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA		RATE(\$)	FEE(\$)					
BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A		N/A	140					
SEARCH FEE <small>(37 CFR 1.16(k), (l), or (m))</small>	N/A	N/A		N/A	240					
EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A		N/A	360					
TOTAL CLAIMS <small>(37 CFR 1.16(j))</small>	14	minus 20 = *		x 40 =	0.00	OR				
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	1	minus 3 = *		x 210 =	0.00					
APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				0.00					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					0.00					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	740	TOTAL				
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total <small>(37 CFR 1.16(i))</small>	*	Minus	**	=	x =		OR	x =	
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total <small>(37 CFR 1.16(i))</small>	*	Minus	**	=	x =		OR	x =	
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET Substitute for Form PTO-1360 (For use with Form PTO/SB/06)							Application Number 14009955		Filing Date	
							Applicant(s) Nicholas LARSSON			
							* May be used for additional claims or amendments			
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT					
	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend
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Total Indep	1		1		0					
Total Depend	13	↙	13	↙	0	↙				
Total Claims	14		14		0					

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053

CONFIRMATION NO. 5445

PUBLICATION NOTICE



OC000000066206999*

27367
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

Title:OPTICAL FIBER CABLE DROP INTERFACE BOX

Publication No.US-2014-0023334-A1

Publication Date:01/23/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445
27367 7590 06/18/2014 WESTMAN CHAMPLIN & KOEHLER, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402			EXAMINER BLEVINS, JERRY M	
			ART UNIT 2883	PAPER NUMBER
			MAIL DATE 06/18/2014	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/009,955	Applicant(s) LARSSON ET AL.	
	Examiner JERRY BLEVINS	Art Unit 2883	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on October 4, 2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-14 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-4 and 11-14 is/are rejected.

8) ☒ Claim(s) 5-10 is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on October 4, 2013 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date 10/4/2013.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.

4) ☐ Other: ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

Claims 1-4 and 11-14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over US 2009/0202214 to Holmberg et al.

Regarding claim 1, Holmberg teaches a drop interface box (200) configured to be mounted to a structure (par. 51) and to receive a drop cable (par. 52) from an optical fiber service provider distribution point and a plurality of distribution cables (par. 53) which distribute the optical fiber service, the drop interface box comprising a base unit (216) having a drop cable entrance (222) configured to receive the drop cable and having drop cable retaining mechanisms (264) spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms (par. 52), a cover (220) having a hinged connection (par. 38) to the base unit to selectively enclose a storage area provided in the base unit, and a fiber storage panel (230) moveable relative to the base unit (Fig. 6) and configured to be stored between the base unit and the cover, the fiber storage panel having a first spool (298) positioned to store a plurality of feed break-out cables (par. 53) coupleable to the plurality of feed break-out cables. Holmberg does not teach that the first spool is a plurality of first spools. However, such a distinction would appear to be mere duplication of the essential working parts of the prior art. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the box of Holmberg by providing a plurality of the first spools, since it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced, *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). The motivation would have been to better facilitate the storage of the plurality of feed break-out cables.

Regarding claim 2, Holmberg teaches that the fiber storage panel includes a hinged connection to the base unit on a side opposite the hinged connection of the cover to the base unit (Fig. 6).

Regarding claim 3, Holmberg teaches that the fiber storage panel further includes an adapter bracket configured to hold one or more adapters which couple to plurality of feed break-out cables to the plurality of distribution cables (par. 56).

Regarding claim 4, Holmberg teaches that the adapter bracket is positioned on a first side of the fiber storage panel and the first spool and second spools are positioned on a second side of the fiber storage panel (Figs. 6, 7).

Regarding claim 11, Holmberg teaches that the drop cable retaining mechanisms in the base unit comprise storage clips positioned on opposing sides of the base unit (par. 64).

Regarding claim 12, Holmberg teaches that the drop cable entrance further comprises slots formed in the base unit and configured to receive a cable clip which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit (pars. 47, 48, 65, 68).

Regarding claim 13, Holmberg teaches a strain-relief clamp coupled to the base unit proximate the drop cable box (pars. 47, 48, 52, 53).

Regarding claim 14, Holmberg teaches a security mechanism for securing the cover to the base unit in a closed position (par. 38).

Allowable Subject Matter

Claims 5-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 5, the prior art, as best exemplified by Holmberg, taken individually or in combination, fails to disclose or render obvious a first set of cable storage clips positioned on the second side of the fiber storage panel proximate the first spool to store the plurality of feed break-out cables and a second set of cable storage clips positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

Regarding claims 6-10, the prior art, as best exemplified by Holmberg, taken individually or in combination, fails to disclose or render obvious a first routing channel and a second routing channel, the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BLEVINS whose telephone number is (571)272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark A. Robinson can be reached on 571-272-2319. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry M Blevins/
Patent Examiner, Art unit 2883

Application/Control Number: 14/009,955
Art Unit: 2883

Page 7

Notice of References Cited	Application/Control No. 14/009,955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.	
	Examiner JERRY BLEVINS	Art Unit 2883	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2009/0202214	08-2009	Holmberg et al.	385/135
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Receipt date: 10/04/2013

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

14009955 - GAIL:2883

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2013-10-04
	First Named Inventor	Nicholas B. LARSSON et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	C64.12-0053	

U.S.PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	5109467		1992-04-28	Hogan et al.			
If you wish to add additional U.S. Patent citation information please click the Add button. Add								
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	20030103750		2003-06-05	Laporte et al.			
	2	20040062508		2004-04-01	Blankenship et al.			
	3	20070086721		2007-04-19	Dobbins et al.			
	4	20090202214		2009-08-13	Holmberg et al.			
If you wish to add additional U.S. Published Application citation information please click the Add button. Add								
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² j	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵

Receipt date: 10/04/2013 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955 - GAU: 2883	
	Filing Date		2013-10-04	
	First Named Inventor	Nicholas B. LARSSON et al.		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		C64.12-0053	

	1	2006195498	JP		2006-07-27	SHODENSHA CO LTD et al.	English translation of Abstract attached.	☒
	2	2009109729	JP		2009-05-21	NITTO ELECTRIC WORKS LTD	English translation of Abstract attached.	☒

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NON-PATENT LITERATURE DOCUMENTS				Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.		T ⁵
	1	Search Report and Written Opinion dated July 3, 2012 for International Application No. PCT/US2012/032320 filed April 5, 2012, 13 pages.		☐

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EXAMINER SIGNATURE			
Examiner Signature	/Jerry Blevins/		Date Considered 06/13/2014

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

Receipt date: 10/04/2013 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955 - GAU: 2883
	Filing Date		2013-10-04
	First Named Inventor	Nicholas B. LARSSON et al.	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		C64.12-0053

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/John Veldhuis-Kroeze/	Date (YYYY-MM-DD)	2013-10-04
Name/Print	John D. Veldhuis-Kroeze	Registration Number	38354

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.B./

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	7	"2009109729"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:15
L2	3	"20070086721".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:17
L3	2	"20030103750".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:18
L4	2	"20090202214".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
L5	3	"2006195498"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
L6	4	"5109467".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
L7	3556	385/135.cds.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:21
L8	7573	g02b6/4452-4455.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:22
L9	9386	7 8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:23
L10	39	9 and drop near3 box	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:25
L11	37	10 and drop near3 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:25
L12	22	11 and distribution near3 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
L13	19	12 and (loop\$3 wound wind\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
L14	15	13 and (retain\$3 retention)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
L15	13	14 and cover\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
L16	13	15 and hinge	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
L17	4	16 and stor\$3 near3 panel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
L18	1	17 and spool	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
L19	3	16 and spool	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
L20	2	(17 19) and feed near5 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:28

EAST Search History (Interference)

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6/ 13/ 2014 6:17:34 PM

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Search Notes 	Application/Control No. 14009955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.
	Examiner JERRY BLEVINS	Art Unit 2883

CPC- SEARCHED		
Symbol	Date	Examiner
G02B6/4452-4455	6/13/2014	JMB

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
385	135	6/13/2014	JMB

SEARCH NOTES		
Search Notes	Date	Examiner
Searched "EAST" databases and search strategies listed in attachment	6/13/2014	JMB
Inventor name searched	6/13/2014	JMB
Searched the related files	6/13/2014	JMB

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	: Nicholas B. Larsson et al.	Confirmation No.: 5445
Appln. No.	: 14/009,955	Group Art Unit: 2883
Filed	: October 4, 2013	Examiner: J. M. Blevins
For	: OPTICAL FIBER CABLE DROP INTERFACE BOX	
Docket No.	: C64.12-0053	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being facsimile transmitted to the USPTO, EFS-Web transmitted to the USPTO, or deposited with the United States Postal Service with sufficient postage in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on SEPTEMBER 18, 2014.

Signature /John D. Veldhuis-Kroeze/.

Printed Name JOHN D. VELDHUIS-KROEZE.

Sir:

This is in response to the Office Action mailed on June 18, 2014. Please amend the above-identified application as follows:

AMENDMENT TO THE CLAIMS

1. (currently amended) A drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service, the drop interface box comprising:

a base unit having a drop cable entrance configured to receive the drop cable and having drop cable retaining mechanisms spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

a cover having a hinged connection to the base unit to selectively enclose a storage area provided in the base unit; and

a fiber storage panel having a hinged connection to the base unit on a side opposite the hinged connection of the cover to the base unit such that the fiber storage panel is moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools positioned to store a plurality of feed break-out cables coupleable to the drop cable, the fiber storage panel further having second spools positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables.

2. (canceled)

3. (previously presented) The drop interface box of claim 1, wherein the fiber storage panel further includes an adapter bracket configured to hold one or more adapters which couple the plurality of feed break-out cables to the plurality of distribution cables.

4. (previously presented) The drop interface box of claim 3, wherein the adapter bracket is positioned on a first side of the fiber storage panel, and the first spools and second spools are positioned on a second side of the fiber storage panel.

5. (previously presented) The drop interface box of claim 4, and wherein the fiber storage panel further includes a first set of cable storage clips positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

6. (previously presented) The drop interface box of claim 4, wherein the fiber storage panel further comprises a first routing channel and a second routing channel, the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

7. (original) The drop interface box of claim 6, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

8. (previously presented) The drop interface box of claim 6, wherein the base unit further comprises a cable channel formed substantially parallel to the hinged connection of the fiber storage panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

9. (previously presented) The drop interface box of claim 8, wherein the distribution cable entrance includes a cable grommet cavity and a bend limiting flange.

10. (previously presented) The drop interface box of claim 9, and further comprising a cable grommet retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

11. (previously presented) The drop interface box of claim 1, wherein the drop cable retaining mechanisms in the base unit comprise storage clips positioned on opposing sides of the base unit.

12. (previously presented) The drop interface box of claim 1, wherein the drop cable entrance further comprises slots formed in the base unit and configured to receive a cable clip which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit.

13. (previously presented) The drop interface box of claim 12, and further comprising a strain-relief clamp coupled to the base unit proximate the drop cable entrance.

14. (previously presented) The drop interface box of claim 1, and further comprising a security mechanism for securing the cover to the base unit in a closed position.

15. (new) A drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service, the drop interface box comprising:

- a base unit having a drop cable entrance configured to receive the drop cable and having drop cable retaining mechanisms spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;

- a cover having a hinged connection to the base unit to selectively enclose a storage area provided in the base unit; and
- a fiber storage panel having first and second sides and being moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools positioned to store a plurality of feed break-out cables coupleable to the drop cable, second spools positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables, and an adapter bracket configured to hold one or more adapters which couple the plurality of feed break-out cables to the plurality of distribution cables, wherein the adapter bracket is positioned on the first side of the fiber storage panel, and the first spools and second spools are positioned on the second side of the fiber storage panel, and wherein the fiber storage panel further includes a first set of cable storage clips positioned on the second side of the fiber storage panel proximate the first spools to store the plurality of feed break-out cables, and a second set of cable storage clips positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

16. (new) A drop interface box configured to be mounted to a structure and to receive a drop cable from an optical fiber service provider distribution point and a plurality of distribution cables which distribute the optical fiber service, the drop interface box comprising:

- a base unit having a drop cable entrance configured to receive the drop cable and having drop cable retaining mechanisms spaced apart and configured to retain a length of drop cable looped around the drop cable retaining mechanisms;
- a cover having a hinged connection to the base unit to selectively enclose a storage area provided in the base unit; and

a fiber storage panel having first and second sides and being moveable relative to the base unit and configured to be stored between the base unit and the cover, the fiber storage panel having first spools positioned to store a plurality of feed break-out cables coupleable to the drop cable, second spools positioned to store a plurality of distribution cables coupleable to the plurality of feed break-out cables, and an adapter bracket configured to hold one or more adapters which couple the plurality of feed break-out cables to the plurality of distribution cables, wherein the adapter bracket is positioned on the first side of the fiber storage panel, and the first spools and second spools are positioned on the second side of the fiber storage panel, wherein the fiber storage panel further comprises a first routing channel and a second routing channel, the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

17. (new) The drop interface box of claim 16, wherein the adapter bracket is positioned in a center region of the first side of the fiber storage panel such that the plurality of feed break-out cables transitioning through the first routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel and the plurality of distribution cables transitioning through the second routing channel from the second side of the fiber storage panel to the first side of the fiber storage panel are coupleable to adapters in the adapter bracket without violating a minimum bend radius of the plurality of feed break-out cables or of the plurality of distribution cables.

18. (new) The drop interface box of claim 16, wherein the base unit further comprises a cable channel formed substantially parallel to the hinged connection of the fiber storage panel to the base unit to allow the plurality of distribution cables to be routed from a distribution cable entrance at a bottom of the base unit toward a top of the base unit and onto the fiber storage panel.

19. (new) The drop interface box of claim 18, wherein the distribution cable entrance includes a cable grommet cavity and a bend limiting flange.

20. (new) The drop interface box of claim 19, and further comprising a cable grommet retainable within the cable grommet cavity to provide a seal between the cable grommet, base unit, and the plurality of distribution cables.

REMARKS

This Amendment is in response to the Office Action dated June 18, 2014. In the Office Action, claims 1-4 and 11-14 were rejected and claims 5-10 were objected to. With this Amendment, claim 1 is amended and new claims 15-20 are added. It is respectfully submitted that all pending claims are in condition for allowance.

Allowable Subject Matter

In the Office Action, claims 5-10 were objected to as being dependent upon a rejected base claim, but were stated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner's indication of allowable subject matter is appreciated. With this Amendment, new independent claim 15 is added which includes the limitations of objected to claim 5, base independent claim 1, and intervening claims 3 and 4. Therefore, new independent claim 15 should be in condition for allowance. Also with this Amendment, new independent claim 16 is added which includes the limitations of objected to claim 6, base independent claim 1, and intervening claims 3 and 4. Also, new claims 17-20 are added which correspond to objected to claims 7-10. Therefore, new claims 16-20 should also be in condition for allowance. Favorable action is respectfully requested.

Claim Rejections - 35 USC § 103

In the Office Action, claims 1-4 and 11-14 were rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over US 2009/0202214 to Holmberg et al., hereafter referred to as "Holmberg." With this Amendment, independent claim 1 is amended to include the limitations of original dependent claim 2, and claim 2 is canceled. All pending claims are believed to be allowable over Holmberg.

In rejecting dependent claim 2, the Office Action stated that "Holmberg teaches that the fiber storage panel includes a hinged connection to the base unit on a side opposite the hinged connection of the cover to the base unit (Fig. 6)." This assertion is respectfully disagreed with as

being unsupported by the disclosure of Holmberg. To the contrary, the disclosure of Holmberg teaches away from this limitation.

The Office Action cites splice tray 230 of Holmberg as a teaching of the fiber storage panel in Applicant's claimed drop interface box. The Office Action then refers to Fig. 6 of Holmberg as providing a disclosure that the fiber storage panel is hinged to the base unit on a side opposite the hinged connection of the cover to the base unit. However, Fig. 6 is an exploded view which demonstrates that splice tray 230 is not hinged to the base unit, or any other structure. See for example, see paragraph [0015] of Holmberg which states "FIG. 6 is a front perspective view of the wall box of FIG. 3 with the front door open and with a splice tray exploded outwardly from the interior of the wall box." (Emphasis added). Further, paragraph [0042] of Holmberg describes Fig. 6 and states:

The splice tray 230 also provides cable/fiber management within the interior of the enclosure 202. The splice tray 230 includes flanges 270 defining fastener openings 272 adapted to align with corresponding bosses 274 that are integrally formed with the main body 216 of the enclosure 202. Each of the bosses 274 defines an internally threaded opening into which a threaded fastener can be threaded. Therefore, by positioning the splice tray 230 so that the fastener openings 272 align with the internally threaded openings of the bosses 274, and then inserting fasteners 276 through the fastener openings 272 and into the bosses 274, the splice tray 230 can easily be fastened within the interior of the enclosure 202. (Emphasis added)

In addition to providing no teaching or suggestion of a hinged connection of the fiber storage panel to the base unit on a side opposite the hinged connection of the cover to the base unit, Fig. 6 and the specification of Holmberg clearly teach away from a hinged connection by using threaded fasteners, fastener openings 272, and bosses 274 to fasten the splice tray to the main body 216. The only disclosed connection between splice tray 230 and main body 216 is via threaded fasteners, and one of skill in the art would not use fasteners in this manner if a hinged connection were utilized. Therefore, amended independent claim 1 is believed to be allowable over the cited art, along with all of dependent claims 3-14.

In addition to being allowable over the cited art based on their dependence from independent claim 1, the dependent claims include limitations providing additional bases for

allowance. As noted in the Office Action, claims 5-10 contain subject matter which is neither taught nor suggested by the cited art. Further, numerous other dependent claims include limitations which are neither taught nor suggested by the cited art.

For example, dependent claim 4 requires that an adapter bracket configured to hold one or more adapters, which couple the plurality of feed break-out cables to the plurality of distribution cables, “is positioned on a first side of the fiber storage panel, and the first spools and second spools are positioned on a second side of the fiber storage panel.” The Office Action cites Figs. 6 and 7 of Holmberg as providing this teaching. However, in Holmberg, adapters 514 are positioned in cover 520, and not on the splice tray 230 cited as being the fiber storage panel. See e.g., Fig. 18 and paragraph [0056] of Holmberg. As other examples, dependent claim 12 requires that “the drop cable entrance further comprises slots formed in the base unit and configured to receive a cable clip which clips over the drop cable, the slots and the cable clip forming a substantially weather tight seal with the base unit”, while dependent claim 13 requires “a strain-relief clamp coupled to the base unit proximate the drop cable entrance.” The Office Action cites Holmberg paragraphs [0047], [0048], [0065] and [0068] as providing disclosure of these limitations. However, a review of Holmberg shows that these limitations are neither taught nor suggested by that reference.

In view of the above-described differences between the present claims and the cited Holmberg reference, withdrawal of the rejections and allowance of all claims are respectfully requested.

It is believed that all of the issues raised in the Office Action regarding the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue, or comment, including the Office Action’s characterizations of the art, does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment or cancellation of any claim does not necessarily signify concession of

unpatentability of the claim prior to its amendment or cancellation. Applicant reserves the right to prosecute the rejection claims in further prosecution of this or related applications.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KOEHLER, P.A.

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JVK/trs

Electronic Acknowledgement Receipt	
EFS ID:	20177602
Application Number:	14009955
International Application Number:	
Confirmation Number:	5445
Title of Invention:	OPTICAL FIBER CABLE DROP INTERFACE BOX
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Theresa Sorbel
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	18-SEP-2014
Filing Date:	04-OCT-2013
Time Stamp:	14:55:08
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2014-09-18Amendment.pdf	66550 e2ef51a9d7ee96a08405c353b815205d767865ed	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	11
Warnings:			
Information:			
Total Files Size (in bytes):		66550	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>			

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 14/009,955		Filing Date 10/04/2013		☐ To be Mailed	
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO									
APPLICATION AS FILED – PART I									
(Column 1)		(Column 2)							
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)	
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A			
☐ SEARCH FEE (37 CFR 1.16(k), (j), or (m))		N/A		N/A		N/A			
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A			
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =			
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =			
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL			
APPLICATION AS AMENDED – PART II									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	09/18/2014		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 19	Minus	** 20	= 0	X \$40 =	0	
	Independent (37 CFR 1.16(h))		* 3	Minus	***3	= 0	X \$210 =	0	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE		0	
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		*	Minus	**	=	X \$ =		
	Independent (37 CFR 1.16(h))		*	Minus	***	=	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE			
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>									

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955	
	Filing Date		2013-10-04	
	First Named Inventor	Nicholas B. Larsson et al.		
	Art Unit	2883		
	Examiner Name	J. M. Blevins		
	Attorney Docket Number	C64.12-0053		

U.S. PATENTS							Remove	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955
	Filing Date		2013-10-04
	First Named Inventor	Nicholas B. Larsson et al.	
	Art Unit	2883	
	Examiner Name	J. M. Blevins	
	Attorney Docket Number	C64.12-0053	

1	Communication dated September 19, 2014 issued in Columbian Patent Application No. 13-250.102, 14 pages.	☐
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<small> ¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached. </small>		

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	Attorney Docket Number	C64.12-0053	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/John Veldhuis-Kroeze/	Date (YYYY-MM-DD)	2014-11-05
Name/Print	John D. Veldhuis-Kroeze	Registration Number	38,354

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

RAD: 13-250102- -4 FECHA: 2014-09-19 08:46:36
DEP: 2020 DIRECCION DE NUEVAS CREACIONES EVE: 378 FASE NACIONAL INCLUIDO CAPITULO I
TRA: 11 PCT-PATENTE DE INVENCION CAPITULOS I Y II FOLIOS: 14
ACT: 519 PRESENTACION

DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado(a)/Señor(a)
SILVANA MARIA LOPEZ DIAZ

Asunto: Radicación: 13-250102- -4
Trámite: 11
Evento: 378
Actuación: 519
Oficio: 11984
Folios: 14

Patente de Invención	X			Patente de Modelo de Utilidad	
Vía Nacional					
Vía PCT (Fase Nacional)	X	Capítulo I	X	Capítulo II	
No. Solicitud Internacional	PCT/US2012/032320				
Fecha de Presentación Internacional	05/04/2012				

Como resultado del examen de fondo realizado, con fundamento en el Artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se comunica:

1. Documentos estudiados

Descripción:	Rad. N° 13-250102-00000-0000	22/Octubre/2013
Reivindicaciones:	Rad. N° 13-250102-00000-0000	22/Octubre/2013
Dibujos:	Rad. N° 13-250102-00000-0000	22/Octubre/2013
Prioridad:	US 61/472,008	05/Abril/2011

2. Análisis de la Prioridad

Se acepta la reivindicación de prioridad porque ésta solicitud fue presentada dentro del plazo establecido (Art. 9 D 486) y su contenido técnico corresponde con el de la prioridad reivindicada.

3. Objeto de la invención

De acuerdo con lo establecido en el numeral 1.2.2.2 del Capítulo Primero del Título X de la Circular Única para efectos del examen de patentabilidad, se tendrá en cuenta la tasa pagada por el solicitante al momento de comenzar el examen para las reivindicaciones adicionales; esto es que cuando la solicitud contenga más de diez (10) reivindicaciones y no se haya pagado la tasa complementaria, sólo se estudiarán las cubiertas por la tasa pagada. Por lo tanto, se estudiarán las reivindicaciones 1 a 14.

Título de la solicitud: "Caja de interfaz de caída de cable de fibra óptica" (ver página 1 del radicado N° 13-250102-00000-0000).

El problema planteado en esta solicitud consiste en la necesidad de suministrar una caja de conexión de cable de fibra óptica que proporcione una salida de múltiples-conexiones o multi-fibra, que permita la recepción de la conexión de fibra óptica de un proveedor de servicios y remite dicha conexión a viviendas dentro del mismo edificio; mejorado con esto la red de distribución de fibra óptica.

Para resolver este problema técnico, la solicitud en estudio proporciona una caja de interfaz de caída (100) configurada para ser montado en una estructura y para recibir un cable de caída (110) desde un punto de distribución del proveedor de fibra óptica y una pluralidad de cables de caída (120) que distribuyen el servicio de fibra óptica, la caja de interfaz de caída caracterizada porque comprende: una unidad de base (205) que tiene una entrada de cable de caída (206) configurado para recibir el cable de caída (110) y que tienen mecanismos de retención de cable de caída (420) espaciados y configurados para retener una longitud de cable de caída enlazado alrededor del cable de caída de los mecanismos de retención; una cubierta (210) que tiene una conexión articulada (401) a la unidad de base para encerrar selectivamente un área de almacenamiento proporcionado en la unidad de base; y un panel de almacenamiento de fibra (405) movable con relación a la unidad de base y configurado para ser almacenado entre la unidad base y la tapa, el panel de almacenamiento de fibra que tiene unos primeros carretes (430) posicionados para almacenar una pluralidad de cables de alimentación de salida (550) acoplables al cable de caída, el panel de almacenamiento de fibra que tiene adicionalmente segundos carretes (440) posicionados para almacenar una pluralidad de cables de distribución (120) acoplables a la pluralidad de cables de alimentación de salida.

El objeto de la presente solicitud se relaciona con la Clasificación Internacional de Patentes (CIP): G02B 06/44.

4. De la solicitud de patente

Reivindicaciones (Art 30 D 486, Art 22 PCT)

Las reivindicaciones 1, 3, 6, 7, 10 y 12 no son claras porque los términos "*espaciados*", "*configurado*", "*pluralidad*", "*curvatura mínima*", son imprecisos, por lo cual no permiten distinguir la invención del estado de la técnica. Se sugiere sustituirlo por un término preciso o un rango concreto.

Las reivindicaciones 1, 4, 11 y 14 no son claras porque los términos "*mecanismo de retención*", "*primer lado*", "*segundo lado*", "*mecanismo de seguridad*" son generales, por lo tanto no permiten establecer la diferencia y el aporte realizado por la invención frente al estado de la técnica.

Las reivindicaciones 1, 3, 5 a 8, 10, 12 y 14 no son claras porque caracterizan la invención por sus resultados a obtener así, "*para recibir el cable de caída (110)*", "*para retener una longitud de cable de caída enlazado alrededor del cable de caída de los mecanismos de retención*", "*para encerrar selectivamente un área de almacenamiento proporcionado en la unidad de base*", "*para ser almacenado entre la unidad base y la tapa*", "*para almacenar una pluralidad de cables de alimentación de salida (550) acoplables al cable de caída*", "*para almacenar una pluralidad de cables de distribución (120) acoplables a la pluralidad de cables de alimentación de salida*", "*para contener uno o más adaptadores (465) que acoplan la pluralidad de cable de alimentación de salida a la pluralidad de cables de distribución*", "*para almacenar la pluralidad de cables de*

alimentación de salida”, “para almacenar la pluralidad de cables de distribución”, “para proporcionar una ruta de enrutamiento para la transición de la pluralidad de cables de alimentación de salida entre los primeros y segundos lados del panel de almacenamiento de fibra”, “para proporcionar una ruta de enrutamiento para la transición de la pluralidad de cables de distribución entre los primeros y segundos lados del panel de almacenamiento de fibra”, “de tal manera que la pluralidad de cables de alimentación de salida hagan transición a través del primer canal de enrutamiento desde el segundo lado del panel de almacenamiento de fibra a la primera cara del panel de almacenamiento de fibra y la pluralidad de cables de distribución que hacen transición a través del segundo canal de enrutamiento desde el segundo lado del panel de almacenamiento de fibra a la primera cara del panel de almacenamiento de fibra son acoplables a los adaptadores en el soporte del adaptador sin violar un radio de curvatura mínimo de la pluralidad de cables de alimentación de salida o de la pluralidad de cables de distribución”, “para permitir que la pluralidad de cables de distribución sean enrutados a partir de una entrada de cable de distribución (535) en una parte inferior de la unidad de base hacia la parte superior de la unidad de base y en el panel de almacenamiento de fibra”, “para proporcionar un cierre hermético entre el ojal de cable, la unidad de base y la pluralidad de cables de distribución”, “para recibir un clip de cable (340) que se engancha sobre el cable de caída, las ranuras y el clip de cable forman un sello hermético contra la intemperie con la unidad base”, “para fijar la cubierta a la unidad base en una posición cerrada” lo cual no es permitido ya que equivaldría a definir el problema técnico a resolver y el alcance de la reivindicación incluiría no sólo la solución propuesta por el solicitante, sino todas las alternativas presentes o futuras que lleguen a ese resultado. Se sugiere reemplazarlo por las características esenciales estructurales que contribuyen a la obtención de ese efecto.

Se recuerda al solicitante que las reivindicaciones son las características técnicas esenciales de una invención para las cuales se reclama la protección legal mediante la solicitud de patente. Para el caso de producto, estas deben contener todas las características técnicas de carácter tangible (partes mecánicas, eléctricas, electrónicas y su relación o conexión), las cuales le permitan obtener los usos, resultados o funcionamiento deseado, pueden contener si es necesario referencias de los dibujos para ser más claras, se permite la presencia de signos de referencia entre paréntesis después de la característica mencionada en la reivindicación.

Por lo anterior, el capítulo reivindicatorio de la solicitud en estudio no cumple con el requisito de claridad acuerdo con el artículo 30 de la Decisión 486. En consecuencia, el solicitante deberá presentar un nuevo capítulo reivindicatorio, donde se hayan modificado las objeciones anteriormente citadas; dichas modificaciones no deben ampliar el objeto inicialmente presentado por la presente solicitud.

5. Determinación del Estado de la Técnica

El estado de la técnica se determinó con base en la fecha de presentación de la solicitud de prioridad: abril 05 de 2011 y se encontraron los siguientes documentos que anticipan el objeto de esta solicitud:

Ítem	Documento	Título	Fecha de Publicación
D1	US 2009/0202214	"Wall box adapted to be mounted at a mid-span access location of a telecommunications cable"	13/Agosto/2009
D2	US 2003/0103750	"Distribution terminal for network access point"	05/Junio/2003

El documento D1¹ divulga una caja de pared adaptada para ser montado en un lugar de acceso mitad del tramo de un cable de fibra óptica de telecomunicaciones. La caja de pared incluye un recinto que tiene un cuerpo principal con un lado frontal abierto. El recinto incluye también una tapa frontal para abrir y cerrar el lado frontal abierto del cuerpo principal. La caja de pared que define primera y segunda aberturas de cable de entrada / salida situados en lados opuestos de la caja (Pág. 1, Fl. 1, resumen).

El documento D2² divulga un terminal de distribución para la interconexión de uno o más cables de derivación de fibra óptica con al menos un cable de distribución de fibra óptica en un punto de acceso conveniente en una red de telecomunicaciones. El terminal comprende una base y una cubierta adaptada para ser abierta y cerrada en la base. La base define una cavidad interior que tiene un área de gestión de fibra inferior para acceder a los cables de distribución y un área de gestión de fibras superior para acceder a los cables de acometida (Pág. 1, Fl. 1, resumen).

6. Examen de Patentabilidad (Art 14 D486)

Nivel inventivo (Art18 D486)

La reivindicación 1 consiste en “Una caja de interfaz de caída (100) configurada para ser montado en una estructura y para recibir un cable de caída (110) desde un punto de distribución del proveedor de fibra óptica y una pluralidad de cables de caída (120) que distribuyen el servicio de fibra óptica...” (Ver página 15 del radicado N° 13-250102-0000-0000).

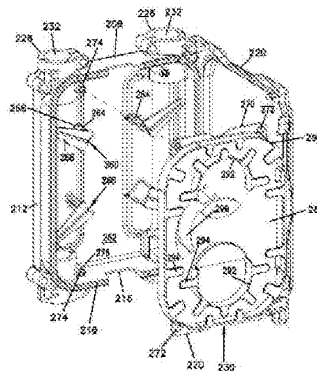
Comparación de las características técnicas esenciales, con las del estado de la técnica:

Características esenciales	D1
Una unidad de base (205) que tiene una entrada de cable de caída (206) y que tiene mecanismo de retención de cable de caída (420).	La caja de pared (200) incluye un recinto generalmente rectangular (202) que incluye una parte frontal (204), un lado posterior (206), un lado superior (208), un lado inferior (210), un lado derecho (212) y un lado izquierdo (214). El recinto (202) incluye un cuerpo principal (216) que define un lado frontal abierto (218). El recinto (202) también incluye una cubierta delantera (220) montada de forma pivotante al cuerpo principal (216). La cubierta delantera (220) es movable entre una primera posición donde el lado frontal abierto (218) del cuerpo principal (216) que está cubierto, y una segunda posición donde el lado frontal abierto (218) del cuerpo principal (216) está expuesto a fin de permitir el acceso al interior de la carcasa (202) desde el lado frontal (204) de la carcasa (202). El cuerpo principal (216) también define las regiones abiertas posteriores (222) situados en las esquinas traseras izquierda y derecha de la carcasa (202). Las regiones abiertas posteriores (222) se muestra extendiéndose desde el lado superior (208) a la parte inferior (210) de la caja (202), la caja (202) también incluye una cubierta de cable (226) que se conectan al cuerpo principal (216) para cubrir las regiones abiertas posteriores (222). la caja de pared (200) incluye además una bandeja de empalme (230) que se monta en el interior de la carcasa (202) y es accesible a través del lado frontal abierto (218) del cuerpo principal (216) cuando la cubierta delantera (220) está abierta (Pág. 2, Fl. 25, Párr. 0035). Una variedad de estructuras de gestión de cable/fibra se proporcionan en el interior del recinto (202). Cuatro miembros de gestión de cable (260) se muestran formados integralmente con una pared posterior (262) del cuerpo principal (216). Cada uno de los miembros de gestión de cable (260) incluye un limitador de radio de curvatura (264) que se proyecta hacia delante desde la pared posterior (262) del cuerpo principal (216). Cada uno de los limitadores radio de curvatura (264) define una superficie curvada exterior (266) que tiene una curvatura que satisface los requisitos de radio mínimo de curvatura de la fibra óptica deseada para ser almacenados dentro del recinto (202). El limitador de radio de curvatura (264) están situados dentro del recinto (202) de manera que para definir un arreglo enrollamiento configurada

1 <https://docs.google.com/viewer?url=patentimages.storage.googleapis.com/pdfs/US20090202214.pdf>

2 <https://docs.google.com/viewer?url=patentimages.storage.googleapis.com/pdfs/US20030103750.pdf>

	para permitir que el exceso de cable de fibra óptica se enrolle o se plegue alrededor de los cuatro limitadores de radio de curvatura (264). Los miembros de gestión de cable (260) también incluyen elementos de retención de cable (268) que se proyectan lateralmente hacia fuera desde extremos delanteros de los limitadores de radio de curvatura (264). Los miembros de retención de cable (268) función para evitar cable de lazo alrededor de los limitadores de radio de curvatura (264) migre hacia delante más allá de los extremos frontales de los limitadores de radio de curvatura (264) (Pág. 3, Fl. 26, Párr. 0041).
Una cubierta (210) que tiene una conexión articulada (401) a la unidad de base.	La cubierta delantera (220) está conectada de forma pivotante al cuerpo principal (216) en un pivote de eje vertical (240) situado generalmente adyacente a un borde delantero izquierdo del cuerpo principal (216). La conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) es proporcionado por una disposición de bisagra incluye un par de pasadores de bisagra (242) formados integralmente con el cuerpo principal (216) y un par de receptores de pasadores de bisagra (244) formados integralmente con un lado posterior de la cubierta frontal (220). Los receptores de pasadores de bisagra (244) incluyen cada uno un par de opuestos, los brazos flexibles (246) que define un bolsillo en el cual los pasadores de bisagra (242) se pueden encajar para proporcionar la conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) del recinto (202) incluye también una disposición de enganche para fijar la cubierta delantera (220) en el posición cerrada (Pág. 2, Fl. 25, Párr. 0038).
Un panel de almacenamiento de fibra (405) movable con relación a la unidad de base; el panel de almacenamiento tiene unos primeros carretes y segundos carretes.	La bandeja de empalme (230) también incluye una estructura (298) de carrete que se proyecta hacia atrás desde el lado posterior del panel principal (288). La estructura de carrete (298) incluye un carrete cilíndrico (300) alrededor del cual el exceso de fibra puede ser envuelto. La estructura de carrete (298) también incluye una brida anular (302) situado en el extremo posterior de la estructura de carrete (298). La brida anular (302) ayuda a retener las fibras de la cola de impresión sobre el carrete (300) se deslice fuera del extremo de la bobina. La brida anular (302) está dimensionada para anidar dentro de la radio de curvatura limitadores (264) del cuerpo principal (216) de la caja (202) cuando la bandeja de empalme (230) está montado dentro de la carcasa (202) (Pág. 3, Fl. 26, Párr. 0045).



La bandeja de empalme (230) es movable con relación a la base (Fl. 7, Fig. 6).

El documento D1 se considera el estado de la técnica cercano a la invención definida en la reivindicación 1 porque divulga una caja de pared adaptada para ser montado en un lugar de acceso mitad del tramo de un cable de fibra óptica de telecomunicaciones. La caja de pared incluye un recinto que tiene un cuerpo principal con un lado frontal abierto. El recinto incluye también una tapa frontal para abrir y cerrar el lado frontal abierto del cuerpo principal. La caja de pared que define primera y segunda aberturas de cable de entrada / salida situados en lados opuestos de la caja (Pág. 1, Fl. 1, resumen).

La diferencia entre la invención, definida en la reivindicación 1 y el dispositivo de D1 consiste en que no menciona unos segundos carretes posicionados para almacenar una pluralidad de cables de distribución.

El efecto que logra el incluir uno segundos carretes es que permiten almacena una pluralidad de cables de distribución.

Por lo tanto, el problema técnico objetivo que pretende resolver esta invención se puede formular así: "¿cómo modificar el dispositivo conocido en D1 para almacenar una pluralidad de cables de distribución?".

Sin embargo, la unos carretes para para almacenar una pluralidad de cables de distribución, ya está divulgada en el documento D1 que se refiere que la bandeja de empalme (230) también incluye una estructura (298) de carrete que se proyecta hacia atrás desde el lado posterior del panel principal (288). La estructura de carrete (298) incluye un carrete cilíndrico (300) alrededor del cual el exceso de fibra puede ser envuelto. La estructura de carrete (298) también incluye una brida anular (302) situado en el extremo posterior de la estructura de carrete (298). La brida anular (302) ayuda a retener las fibras de la cola de impresión sobre el carrete (300) se deslice fuera del extremo de la bobina. La brida anular (302) está dimensionada para anidar dentro de la radio de curvatura limitadores (264) del cuerpo principal (216) de la caja (202) cuando la bandeja de empalme (230) está montado dentro de la carcasa (202) (Pág. 3, Fl. 26, Párr. 0045).

Por lo tanto, los segundos carretes posicionados para almacenar una pluralidad de cables, no evidencian un efecto técnico sorprendente, puesto que dichos carretes del documento D1 son utilizados para almacenar o envolver una pluralidad de cables. Por lo cual se considera obvia.

Asimismo, el documento D1 divulga las características de las reivindicaciones dependientes así:

- Reivindicación 3 y 4: La caja de pared (500) incluye una cubierta delantera modificada (520) montado de forma pivotante en el cuerpo principal (216). La cubierta delantera 520 es movable entre una primera posición donde el lado frontal abierto (218) del cuerpo principal está cubierto, y una segunda posición donde el lado frontal abierto (218) del cuerpo principal (216) está expuesto a permitir el acceso al interior del recinto (502) desde el lado frontal de la carcasa (502). La cubierta delantera (520) define una cavidad interna (522). Una pluralidad de adaptadores de fibra óptica (514) están montadas en la cubierta frontal (520) Cada uno de los adaptadores de fibra óptica (514) incluye un puerto interno (518) colocado dentro de la cavidad interna (522) de la cubierta delantera (520), y un puerto exterior (516) posicionada en una superficie exterior de la cubierta delantera (520) en el uso de la caja de pared (500), las fibras desde una ubicación de acceso mitad del tramo de un cable pasado a través de la caja de pared (500) son empalmados a una pluralidad de conectores de fibra óptica que tiene extremos conectorizados. Los conectores extremos de conexión conectorizados se insertan preferiblemente dentro de los puertos interiores (518) de los adaptadores de fibra óptica (514). Al conectar un conector en el extremo de un cable de caída en un puerto exterior (516) de uno de los adaptadores (514) de fibra óptica, el cable de caída puede ser ópticamente conectado a una de las fibras del cable pasado a través de la caja de pared (500). (Pág. 5, Fl. 28, Párr. 0056).
- Reivindicación 11: Durante el montaje de las cajas, los adaptadores de fibra óptica (514) se montan dentro de las aberturas definidas a través de las cubiertas de las cajas del montaje adaptador. Después de la instalación de los adaptadores (514) de fibra óptica, el tapón de polvo (568) se puede quitar para permitir que los conectores de fibra óptica (530) terminen en el cable flexible (528) fibras ópticas empalmadas a las fibras del cable principal correspondiente para ser insertado en los puertos interiores (518). Cuando el interior conectores de fibra óptica (530) se insertan en los puertos interiores (518), las férulas de los conectores de fibra óptica interiores (530) se reciben dentro de los primeros extremos (554) del clip de manguitos (550), (580) y los clips retienen los conectores de fibra óptica interior (530) dentro de los puertos

internos (518) (Pág. 6, Fl. 29, Párr. 0064).

- Reivindicaciones 12 y 13: las porciones de sujeción de cables (310) se proporcionan en cada una de las aberturas (232). Cada parte de sujeción de cable (310) está definido por una primera mitad del cilindro (312) formado integralmente con el cuerpo principal (216) y un segundo medio de cilindro (314) provisto en una de las cubiertas de cables (226). Los rieles (316) establecidos en el segundo medio de cilindro (314) ajustan dentro de las ranuras correspondientes (318) proporcionados en la primera mitad del cilindro (312) para ayudar a mantener la alineación entre los cilindros de medio (312), (314) durante el montaje y sujeción. Los patrones (320) están formados integralmente con el cubre cable (226) y (322), correspondientes los patrones están formados integralmente con el cuerpo principal (216). Cuando el cubre cable (226) están montados en sus correspondientes regiones traseras abiertas (222), los patrones (320), (322) se alinean entre sí de modo que los sujetadores puede ser insertado a través de los patrones de (320), (322) para dibujar los medios cilindros (314) hacia los medios cilindros (312) para proporcionar una acción de sujeción. Los elementos de sujeción insertados a través de los patrones (320), (322) también funcionan para asegurar el cable (226) cubre al cuerpo principal (216) (Pag4, Fl. 27, Párr. 0047).
- Reivindicación 14: La cubierta delantera (220) está conectada de forma pivotante al cuerpo principal (216) en un pivote de eje vertical (240) situado generalmente adyacente a un borde delantero izquierdo del cuerpo principal (216). La conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) es proporcionado por una disposición de bisagra incluye un par de pasadores de bisagra (242) formados integralmente con el cuerpo principal (216) y un par de receptores de pasadores de bisagra (244) formados integralmente con un lado posterior de la cubierta frontal (220). Los receptores de pasadores de bisagra (244) incluyen cada uno un par de opuestos, los brazos flexibles (246) que define un bolsillo en el cual los pasadores de bisagra (242) se pueden encajar para proporcionar la conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) del recinto (202) incluye también una disposición de enganche para fijar la cubierta delantera (220) en el posición cerrada (Pág. 2, Fl. 25, Párr. 0038).

Por su parte, la reivindicación dependiente 7 no menciona alguna característica que haga inventivo la caja de la reivindicación 1, debido a que, divulga las mismas características técnicas de la reclamación independiente o se encuentran redactadas en términos de usos, resultados y/o características no técnicas. Por lo tanto, no se considera inventiva.

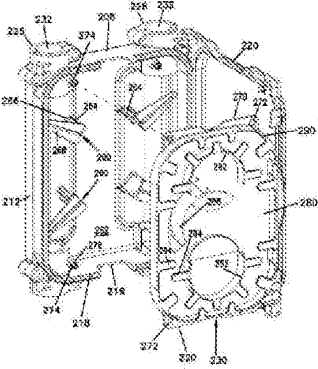
Nivel inventivo (Art18 D486)

Las reivindicaciones dependientes 2, 5 y 8 consisten en “La caja de interfaz de caída de la reivindicación 1 caracterizada porque el panel de almacenamiento en fibra incluye una conexión articulada (406) a la unidad de base en un lado opuesto a la conexión articulada...” (Ver página 15 del radicado N° 13-250102-0000-0000).

Comparación de las características técnicas esenciales, con las del estado de la técnica:

Reivi.	Características esenciales	D1	D2
1	Una unidad de base (205) que tiene una entrada de cable de caída (206) y que tiene mecanismo de retención de cable de caída (420).	La caja de pared (200) incluye un recinto generalmente rectangular (202) que incluye una parte frontal (204), un lado posterior (206), un lado superior (208), un lado inferior (210), un lado derecho (212) y un lado izquierdo (214). El recinto (202) incluye un cuerpo principal (216) que define un lado frontal abierto (218). El recinto (202) también incluye una cubierta delantera (220) montada de forma pivotante al	No menciona.

	<p>cuerpo principal (216). La cubierta delantera (220) es movable entre una primera posición donde el lado frontal abierto (218) del cuerpo principal (216) que está cubierto, y una segunda posición donde el lado frontal abierto (218) del cuerpo principal (216) está expuesto a fin de permitir el acceso al interior de la carcasa (202) desde el lado frontal (204) de la carcasa (202). El cuerpo principal (216) también define las regiones abiertas posteriores (222) situados en las esquinas traseras izquierda y derecha de la carcasa (202). Las regiones abiertas posteriores (222) se muestra extendiéndose desde el lado superior (208) a la parte inferior (210) de la caja (202), la caja (202) también incluye una cubierta de cable (226) que se conectan al cuerpo principal (216) para cubrir las regiones abiertas posteriores (222). la caja de pared (200) incluye además una bandeja de empalme (230) que se monta en el interior de la carcasa (202) y es accesible a través del lado frontal abierto (218) del cuerpo principal (216) cuando la cubierta delantera (220) está abierta (Pág. 2, Fl. 25, Párr. 0035).</p> <p>Una variedad de estructuras de gestión de cable/fibra se proporcionan en el interior del recinto (202). Cuatro miembros de gestión de cable (260) se muestran formados integralmente con una pared posterior (262) del cuerpo principal (216). Cada uno de los miembros de gestión de cable (260) incluye un limitador de radio de curvatura (264) que se proyecta hacia delante desde la pared posterior (262) del cuerpo principal (216). Cada uno de los limitadores radio de curvatura (264) define una superficie curvada exterior (266) que tiene una curvatura que satisfaga los requisitos de radio mínimo de curvatura de la fibra óptica deseada para ser almacenados dentro del recinto (202). El limitador de radio de curvatura (264) están situados dentro del recinto (202) de manera que para definir un arreglo enrollamiento configurada para permitir que el exceso de cable de fibra óptica se enrolle o se plegue alrededor de los cuatro limitadores de radio de curvatura (264). Los miembros de gestión de cable (260) también incluyen elementos de retención de cable (268) que se proyectan lateralmente hacia fuera desde extremos delanteros de los limitadores de radio de curvatura (264). Los miembros de retención de cable (268) función para evitar cable de lazo alrededor de los limitadores de radio de curvatura (264) migre hacia delante más allá de los extremos frontales de los limitadores de radio de curvatura (264) (Pág. 3, Fl. 26, Párr. 0041).</p>	
Una cubierta (210) que tiene una conexión articulada (401) a la unidad de base.	La cubierta delantera (220) está conectada de forma pivotante al cuerpo principal (216) en un pivote de eje vertical (240) situado generalmente adyacente a un borde delantero izquierdo del cuerpo principal (216). La conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) es proporcionado por una disposición de bisagra incluye un par de pasadores de bisagra (242) formados integralmente con el cuerpo principal	No menciona.

		(216) y un par de receptores de pasadores de bisagra (244) formados integralmente con un lado posterior de la cubierta frontal (220). Los receptores de pasadores de bisagra (244) incluyen cada uno un par de opuestos, los brazos flexibles (246) que define un bolsillo en el cual los pasadores de bisagra (242) se pueden encajar para proporcionar la conexión pivotante entre la cubierta delantera (220) y el cuerpo principal (216) del recinto (202) incluye también una disposición de enganche para fijar la cubierta delantera (220) en el posición cerrada (Pág. 2, Fl. 25, Párr. 0038).	
	Un panel de almacenamiento de fibra (405) movable con relación a la unidad de base; el panel de almacenamiento tiene unos primeros carretes y segundos carretes.	La bandeja de empalme (230) también incluye una estructura (298) de carrete que se proyecta hacia atrás desde el lado posterior del panel principal (288). La estructura de carrete (298) incluye un carrete cilíndrico (300) alrededor del cual el exceso de fibra puede ser envuelto. La estructura de carrete (298) también incluye una brida anular (302) situado en el extremo posterior de la estructura de carrete (298). La brida anular (302) ayuda a retener las fibras de la cola de impresión sobre el carrete (300) se deslice fuera del extremo de la bobina. La brida anular (302) está dimensionada para anidar dentro de la radio de curvatura limitadores (264) del cuerpo principal (216) de la caja (202) cuando la bandeja de empalme (230) está montado dentro de la carcasa (202) (Pág. 3, Fl. 26, Párr. 0045).	No menciona.
		 <p>La bandeja de empalme (230) es movable con relación a la base (Fl. 7, Fig. 6).</p>	No menciona.
2	El panel de almacenamiento de fibra incluye una conexión articulada (406) a la unidad de la base en un lado opuesto a la conexión articulada de la cubierta a la unidad de base		El panel de transición (40) es generalmente rectangular y está fijada de forma articulada a la base (20) a lo largo del borde superior de una de las paredes laterales (22) en una o más ubicaciones de la bisagra (42). La ubicación de las bisagras (42) están situadas en la pared lateral (22) opuesta a las ubicaciones de la bisagra (52) que de manera articulada sujetan la cubierta (50) y la base (20) Sin embargo, las

			<p>ubicaciones de las bisagras (42) pueden estar situadas en la misma pared lateral (22) como las ubicaciones de las bisagras (52). Alternativamente, el panel de transición (40) puede estar unido de forma deslizante a la base (20) para exponer selectivamente partes de la cavidad interior (21) de la base (20), o puede ser unida de manera separable a la base (20) para proporcionar un acceso sin obstáculos a la cavidad interior (21). La base (20) está provista preferiblemente de al menos tres ubicaciones de bisagras (42) a lo largo de la pared lateral (22) de modo que el panel de transición (40) puede estar posicionado más cerca de la pared de extremo (23), opuesto a la pared de extremo (23) a través del cual los cables de acometida (12) entran en el terminal (10) (Pág. 4, Fl. 10 Párr. 0018).</p>
5	<p>El panel de almacenamiento de fibra incluye además un primer conjunto de clips de amamantamiento de cables (435) situado en el segundo panel de almacenamiento de fibra cerca de los primeros carretes, y un segundo conjunto de clips de almacenamiento de cable (445) posicionados en el segundo lado del panel de almacenamiento de fibra próximo a los segundos carretes.</p>	No menciona.	<p>El tubo de transporte (13) se dirige hacia la derecha alrededor de la superficie exterior del panel de transición (40) y a través de una serie de enrutamiento de guía (459 a bandeja de empalme convencional (46). Dentro de la bandeja de empalme (46), cada fibra óptica (14) dentro del tubo de transporte (13) se empalma a un coleta (15) de cualquier manera conocida, tal como mediante fusión o empalme mecánico. El cable flexible (15) sale de la bandeja de empalme (46) y se encamina hacia la izquierda a través de la guía (45) de enrutamiento a un adaptador de transición (48) montado dentro de una abertura (49) formada a través del panel de transición (40) (Pág. 4, Fl. 10, Párr. 0019).</p>
8	<p>La unidad de base comprende además un canal de cable (530) formado sustancialmente paralelo a la</p>	No menciona.	<p>Al menos uno de los tubos protectores (17) se encamina en un área de gestión de fibra inferior (26), mientras que el resto de los tubos protectores (17) se</p>

	conexión articulada del panel de almacenamiento de fibra a la unidad de base.	encaminan a un área de almacenamiento de elementos sueltos (60) donde se almacenan una o más bobinas de los tubos protectores 17 restantes. Las bobinas de tubos protectores (17) no utilizados se almacenan en un plano generalmente perpendicular al plano del área de gestión de fibra inferior (26). En consecuencia, la cantidad de espacio dentro de la cavidad interior (21) del terminal (10) para la interconexión de las fibras ópticas (14) de los cables de acometida (12) de fibras ópticas (18) del cable de distribución (16) se maximiza. Los tubos de protectores (17) son entonces enviados desde el área de almacenamiento de elementos sueltos (60) de la terminal (10) a través de uno de los conjuntos de puerto del cable (30) previstos en la pared extremo opuesto (23) del terminal (10) (Pág. 3, Fl. 9, Párr. 0016).
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Los documentos D1 y D2 se consideran el estado de la técnica cercano a la invención definida en las reivindicaciones dependientes 2, 5 y 8 porque divulgan una caja de pared adaptada para ser montado en un lugar de acceso mitad del tramo de un cable de fibra óptica de telecomunicaciones. La caja de pared incluye un recinto que tiene un cuerpo principal con un lado frontal abierto. El recinto incluye también una tapa frontal para abrir y cerrar el lado frontal abierto del cuerpo principal. La caja de pared que define primera y segunda aberturas de cable de entrada / salida situados en lados opuestos de la caja (Pág. 1, Fl. 1, resumen). Y un terminal de distribución para la interconexión de uno o más cables de derivación de fibra óptica con al menos un cable de distribución de fibra óptica en un punto de acceso conveniente en una red de telecomunicaciones. El terminal comprende una base y una cubierta adaptada para ser abierta y cerrada en la base. La base define una cavidad interior que tiene un área de gestión de fibra inferior para acceder a los cables de distribución y un área de gestión de fibras superior para acceder a los cables de acometida (Pág. 1, Fl. 1, resumen). Correspondientemente.

La diferencia entre la invención, definida en las reivindicaciones 2, 5 y 8, y el dispositivo de D1 consiste en que no menciona que el panel de almacenamiento de fibra incluye una conexión articulada (406) a la unidad de la base en un lado opuesto a la conexión articulada de la cubierta a la unidad de base; el panel de almacenamiento de fibra incluye además un primer conjunto de clips de amamantamiento de cables (435) situado en el segundo panel de almacenamiento de fibra cerca de los primeros carretes, y un segundo conjunto de clips de almacenamiento de cable (445) posicionados en el segundo lado del panel de almacenamiento de fibra próximo a los segundos carretes; ni la unidad de base que comprende además un canal de cable (530) formado sustancialmente paralelo a la conexión articulada del panel de almacenamiento de fibra a la unidad de base.

El efecto que logra el incluir el panel de almacenamiento de fibra incluye una conexión articulada (406) a la unidad de la base en un lado opuesto a la conexión articulada de la cubierta a la unidad de base; el panel de almacenamiento de fibra incluye además un primer conjunto de clips de amamantamiento de cables (435) situado en el segundo panel de almacenamiento de fibra cerca de los primeros carretes, y un segundo conjunto de clips de almacenamiento de cable (445) posicionados en el segundo lado del panel de almacenamiento de fibra próximo a los segundos carretes y la unidad de base que comprende además un canal de cable (530) formado sustancialmente paralelo a la conexión articulada del panel de almacenamiento de fibra a la unidad de base; es que permiten la apertura y cierre del panel de almacenamiento permitiendo un fácil acceso sin tensión excesiva del cable, y proporcionar un almacenamiento y enrutamiento del cable dentro de la caja de interfaz.

Por lo tanto, el problema técnico objetivo que pretende resolver esta invención se puede formular así: "¿cómo modificar el dispositivo conocido en D1 para permitir la apertura y cierre del panel de almacenamiento permitiendo un fácil acceso sin tensión excesiva del cable, y proporcionar un almacenamiento y enrutamiento del cable dentro de la caja de interfaz?".

Sin embargo, la utilización del panel de almacenamiento de fibra que incluye una conexión articulada (406) a la unidad de la base en un lado opuesto a la conexión articulada de la cubierta a la unidad de base; el panel de almacenamiento de fibra que incluye además un primer conjunto de clips de amamantamiento de cables (435) situado en el segundo panel de almacenamiento de fibra cerca de los primeros carretes, y un segundo conjunto de clips de almacenamiento de cable (445) posicionados en el segundo lado del panel de almacenamiento de fibra próximo a los segundos carretes y la unidad de base que comprende además un canal de cable (530) formado sustancialmente paralelo a la conexión articulada del panel de almacenamiento de fibra a la unidad de base para permitir la apertura y cierre del panel de almacenamiento permitiendo un fácil acceso sin tensión excesiva del cable, y proporcionar un almacenamiento y enrutamiento del cable dentro de la caja de interfaz, ya está divulgada en el documento D2 que se refiere el panel de transición (40) es generalmente rectangular y está fijada de forma articulada a la base (20) a lo largo del borde superior de una de las paredes laterales (22) en una o más ubicaciones de la bisagra (42). La ubicación de las bisagras (42) están situadas en la pared lateral (22) opuesta a las ubicaciones de la bisagra (52) que de manera articulada sujetan la cubierta (50) y la base (20) Sin embargo, las ubicaciones de las bisagras (42) pueden estar situadas en la misma pared lateral (22) como las ubicaciones de las bisagras (52). Alternativamente, el panel de transición (40) puede estar unido de forma deslizante a la base (20) para exponer selectivamente partes de la cavidad interior (21) de la base (20), o puede ser unida de manera separable a la base (20) para proporcionar un acceso sin obstáculos a la cavidad interior (21). La base (20) está provista preferiblemente de al menos tres ubicaciones de bisagras (42) a lo largo de la pared lateral (22) de modo que el panel de transición (40) puede estar posicionado más cerca de la pared de extremo (23), opuesto a la pared de extremo (23) a través del cual los cables de acometida (12) entran en el terminal (10) (Pág. 4, Fl. 10 Párr. 0018). El tubo de transporte (13) se dirige hacia la derecha alrededor de la superficie exterior del panel de transición (40) y a través de una serie de enrutamiento de guía (459) a bandeja de empalme convencional (46). Dentro de la bandeja de empalme (46), cada fibra óptica (14) dentro del tubo de transporte (13) se empalma a un coleta (15) de cualquier manera conocida, tal como mediante fusión o empalme mecánico. El cable flexible (15) sale de la bandeja de empalme (46) y se encamina hacia la izquierda a través de la guía (45) de enrutamiento a un adaptador de transición (48) montado dentro de una abertura (49) formada a través del panel de transición (40) (Pág. 4, Fl. 10, Párr. 0019). Al menos uno de los tubos protectores (17) se encamina en un área de gestión de fibra inferior (26), mientras que el resto de los tubos protectores (17) se encaminan a un área de almacenamiento de elementos sueltos (60)

donde se almacenan una o más bobinas de los tubos protectores 17 restantes. Las bobinas de tubos protectores (17) no utilizados se almacenan en un plano generalmente perpendicular al plano del área de gestión de fibra inferior (26). En consecuencia, la cantidad de espacio dentro de la cavidad interior (21) del terminal (10) para la interconexión de las fibras ópticas (14) de los cables de acometida (12) de fibras ópticas (18) del cable de distribución (16) se maximiza. Los tubos de protectores (17) son entonces enviados desde el área de almacenamiento de elementos sueltos (60) de la terminal (10) a través de uno de los conjuntos de puerto del cable (30) previstos en la pared extremo opuesto (23) del terminal (10) (Pág. 3, Fl. 9, Párr. 0016).

En consecuencia, el la persona del oficio normalmente versada en la materia, incluiría el panel de almacenamiento que incluye una conexión articulada (406) a la unidad de la base en un lado opuesto a la conexión articulada de la cubierta a la unidad de base; el panel de almacenamiento de fibra que incluye además un primer conjunto de clips de almacenamiento de cables, y un segundo conjunto de clips de almacenamiento de cable y la unidad de base que comprende además un canal de cable formado sustancialmente paralelo a la conexión articulada del panel de almacenamiento de fibra a la unidad de base del documento D2 en el dispositivo divulgado en el documento D1 para llegar así al objeto de la reivindicación 1 de la solicitud. Por lo cual se considera obvia.

7. Conclusión

Los requisitos de Patentabilidad de la presente solicitud están afectados así:

Ítem	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US 2009/0202214	1, 3, 4, 11 a 14	Nivel Inventivo
D1	US 2009/0202214	2, 5 y 8	Nivel Inventivo
D2	US 2003/0103750	2, 5 y 8	Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta (60) días contados a partir del día siguiente de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Se invita al solicitante se sirva indicar, si así lo considera, su renuncia al término faltante de sesenta (60) días para dar respuesta a este requerimiento y presentarla por escrito.

Finalmente, se le recuerda al solicitante que si como respuesta a este requerimiento llegara a modificar el capítulo reivindicatorio y éste contenga más de diez (10) reivindicaciones, no pagará la tasa de modificación voluntaria pero sí la correspondiente al pago por reivindicación adicional.

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


JOSÉ LUIS SALAZAR LÓPEZ
Director de Nuevas Creaciones (c)

El anterior requerimiento fue notificado por fijación en lista, de fecha 2014-09-23

Elaboró: Diego Gonzalez Castillo
Revisó: Sonia Andrea Diaz Pirazan

Electronic Acknowledgement Receipt	
EFS ID:	20613463
Application Number:	14009955
International Application Number:	
Confirmation Number:	5445
Title of Invention:	OPTICAL FIBER CABLE DROP INTERFACE BOX
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Theresa Sorbel
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	05-NOV-2014
Filing Date:	04-OCT-2013
Time Stamp:	15:54:47
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2014-11-05IDS.pdf	612166 8efe5e29cb91a849fb393a0acece6e564b5dd135a	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

2	Non Patent Literature	OA-columbia.pdf	830489 2240a553ba6248a4061f26db9b7b2db7af1ab2f0	no	14
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Warnings:

Information:

Total Files Size (in bytes):	1442655
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

New International Application Filed with the USPTO as a Receiving Office

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



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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NOTICE OF ALLOWANCE AND FEE(S) DUE

27367 7590 12/15/2014
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

EXAMINER

BLEVINS, JERRY M

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 12/15/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445

TITLE OF INVENTION: OPTICAL FIBER CABLE DROP INTERFACE BOX

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	03/16/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

27367 7590 12/15/2014
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445

TITLE OF INVENTION: OPTICAL FIBER CABLE DROP INTERFACE BOX

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	03/16/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
BLEVINS, JERRY M	2883	385-135000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445
27367 7590 12/15/2014 WESTMAN CHAMPLIN & KOEHLER, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402				
EXAMINER BLEVINS, JERRY M				
ART UNIT 2883		PAPER NUMBER		

DATE MAILED: 12/15/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 14/009,955	Applicant(s) LARSSON ET AL.	
	Examiner JERRY BLEVINS	Art Unit 2883	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed September 18, 2014.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1 and 3-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/oph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>11/5/2014</u> 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.	5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____.
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DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Response to Arguments

Applicant's arguments have been fully considered and are persuasive. The rejection of claims 1, 3, 4, and 11-14 and the objection to claims 5-10 have been withdrawn.

Allowable Subject Matter

Claims 1 and 3-20 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 1 and 3-14, the prior art as best exemplified by US 2009/0202214 to Holmberg et al., taken individually or in combination, fails to disclose or render obvious a fiber storage panel having a hinged connection to the base unit on a side opposite the hinged connection of the cover to the base unit such that the fiber storage panel is moveable relative to the base unit and configured to be stored between the base unit and the cover.

Regarding claim 15, the prior art, as best exemplified by Holmberg, taken individually or in combination, fails to disclose or render obvious a first set of cable

storage clips positioned on the second side of the fiber storage panel proximate the first spool to store the plurality of feed break-out cables and a second set of cable storage clips positioned on the second side of the fiber storage panel proximate the second spools to store the plurality of distribution cables.

Regarding claims 16-20, the prior art, as best exemplified by Holmberg, taken individually or in combination, fails to disclose or render obvious a first routing channel and a second routing channel, the first routing channel configured to provide a routing path for transitioning the plurality of feed break-out cables between the first and second sides of the fiber storage panel, the second routing channel configured to provide a routing path for transitioning the plurality of distribution cables between the first and second sides of the fiber storage panel.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BLEVINS whose telephone number is (571)272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark A. Robinson can be reached on 571-272-2319. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry M Blevins/
Primary Examiner, Art Unit 2883

Issue Classification 	Application/Control No. 14009955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.	
	Examiner JERRY BLEVINS	Art Unit 2883	

CPC					
Symbol				Type	Version
G02B	6	/	4446	F	2013-01-01
G02B	6	/	445	I	2013-01-01
G02B	6	/	4471	A	2013-01-01
G02B	6	/	4478	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
(Assistant Examiner)		19	
(Date)			
/JERRY BLEVINS/ Primary Examiner.Art Unit 2883	12/5/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4-1

Issue Classification 	Application/Control No. 14009955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.
	Examiner JERRY BLEVINS	Art Unit 2883

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION														
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED									
385			135			G	0	2	B	6 / 00 (2006.01.01)										
CROSS REFERENCE(S)																				
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																			

NONE		Total Claims Allowed:	
		19	
(Assistant Examiner)	(Date)		
/JERRY BLEVINS/ Primary Examiner. Art Unit 2883	12/5/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4-1

Issue Classification 	Application/Control No. 14009955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.
	Examiner JERRY BLEVINS	Art Unit 2883

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	18												
2	3	18	19												
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14	15														
15	16														
16	17														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 19	
/JERRY BLEVINS/ Primary Examiner. Art Unit 2883 (Primary Examiner) _____ (Date) _____		O.G. Print Claim(s) 1	O.G. Print Figure 4-1

Receipt date: 11/05/2014

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

14009955 - GALL:2883

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955	
	Filing Date		2013-10-04	
	First Named Inventor	Nicholas B. Larsson et al.		
	Art Unit	2883		
	Examiner Name	J. M. Blevins		
	Attorney Docket Number	C64.12-0053		

U.S. PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
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	1							☐
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NON-PATENT LITERATURE DOCUMENTS							Remove	
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

Receipt date: 11/05/2014 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955	14009955 - GAU: 2883
	Filing Date		2013-10-04	
	First Named Inventor	Nicholas B. Larsson et al.		
	Art Unit	2883		
	Examiner Name	J. M. Blevins		
	Attorney Docket Number	C64.12-0053		

/J.B./	1	Communication dated September 19, 2014 issued in Columbian Patent Application No. 13-250.102, 14 pages.	☐
If you wish to add additional non-patent literature document citation information please click the Add button Add			
EXAMINER SIGNATURE			
Examiner Signature	/Jerry Blevins/		Date Considered 12/05/2014
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			
<small> ¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached. </small>			

Receipt date: 11/05/2014 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14009955 14009955 - GAU: 2883
	Filing Date		2013-10-04
	First Named Inventor	Nicholas B. Larsson et al.	
	Art Unit	2883	
	Examiner Name	J. M. Blevins	
	Attorney Docket Number	C64.12-0053	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/John Veldhuis-Kroeze/	Date (YYYY-MM-DD)	2014-11-05
Name/Print	John D. Veldhuis-Kroeze	Registration Number	38,354

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.B./



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
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BIB DATA SHEET

CONFIRMATION NO. 5445

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
14/009,955	10/04/2013	385	2883	C64.12-0053		
APPLICANTS INVENTORS Nicholas B. Larsson, Blomkest, MN; Andrew E. Swienton, Plymouth, MN; George I. Wakileh, Batavia, IL; ** CONTINUING DATA ***** This application is a 371 of PCT/US2012/032320 04/05/2012 which claims benefit of 61/472,008 04/05/2011 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 10/12/2013						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/JERRY M BLEVINS/</u> Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 17	TOTAL CLAIMS 14	INDEPENDENT CLAIMS 1
ADDRESS WESTMAN CHAMPLIN & KOEHLER, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402 UNITED STATES						
TITLE OPTICAL FIBER CABLE DROP INTERFACE BOX						
FILING FEE RECEIVED 740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	3809	385/135.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/05 16:27
L4	5	2 and storage adj panel with hing\$3 with cover\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/05 16:27
L5	1	2 and storage adj panel with hing\$3 with cover\$3 with opposite	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/05 16:28
L6	1	"385"/\$.ccls. and storage adj panel with hing\$3 with cover\$3 with opposite	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/05 16:28
L7	1	storage adj panel with hing\$3 with cover\$3 with opposite	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/05 16:28
S1	7	"2009109729"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:15
S2	3	"20070086721".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:17
S3	2	"20030103750".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:18
S4	2	"20090202214".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
S5	3	"2006195498"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
S6	4	"5109467".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:20
S7	3556	385/135.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:21

S8	7573	g02b6/4452-4455.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:22
S9	9386	S7 S8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:23
S10	39	S9 and drop near3 box	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:25
S11	37	S10 and drop near3 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:25
S12	22	S11 and distribution near3 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
S13	19	S12 and (loop\$3 wound wind\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
S14	15	S13 and (retain\$3 retention)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
S15	13	S14 and cover\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
S16	13	S15 and hinge	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:26
S17	4	S16 and stor\$3 near3 panel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
S18	1	S17 and spool	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
S19	3	S16 and spool	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:27
S20	2	(S17 S19) and feed near5 cable	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/13 17:28

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	3002	385/135.ccls.	US-PGPUB; USPAT; UPAD	OR	ON	2014/12/05 16:28

12/ 5/ 2014 4:43:05 PM

C:\Users\jblevins\Documents\EAST\Workspaces\14009955.wsp

Search Notes 	Application/Control No. 14009955	Applicant(s)/Patent Under Reexamination LARSSON ET AL.
	Examiner JERRY BLEVINS	Art Unit 2883

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
385	135	12/5/2014	JMB

SEARCH NOTES		
Search Notes	Date	Examiner
Searched "EAST" databases and search strategies listed in attachment	12/5/2014	JMB
Inventor name searched	12/5/2014	JMB
Searched the related files	12/5/2014	JMB

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
385	135	12/5/2014	JMB

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445
27367 7590 01/30/2015 WESTMAN CHAMPLIN & KOEHLER, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402			EXAMINER BLEVINS, JERRY M	
			ART UNIT 2883	PAPER NUMBER
			MAIL DATE 01/30/2015	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
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Application No. : 14009955
Applicant : Larsson
Filing Date : 10/04/2013
Date Mailed : 01/30/2015

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The application is not in compliance with 37 CFR 1.78, as indicated in the attachment. The consequences of failure to respond within the above-identified time period are set forth in the attachment.

Even if the Office has recognized a benefit claim and has entered it into the Office's database and included it on applicant's filing receipt, the benefit claim is not a proper benefit claim unless the reference in compliance with 37 CFR 1.78 is included, depending upon the application's filing date and as indicated in the attachment, in an application data sheet or in the first sentence(s) of the specification and all other requirements are met.

See attachment.

*A copy of this notice **MUST** be returned with the reply. Please address response to
"Mail Stop Issue Fee, Commissioner for Patents,
P.O. Box 1450, Alexandria, VA 22313-1450".*

/Anita Grimmage/
Publication Branch
Office of Data Management
(571) 272-4200

**APPLICATION FILED ON OR AFTER MARCH 16, 2013,
NOT IN COMPLIANCE WITH 37 CFR 1.78**

- ☐ The 37 CFR 1.78(c)(2) reference on the application data sheet does not indicate the relationship (continuation, division, continuation-in-part) to the prior U.S. nonprovisional application or international application designating the U.S. See document coded dated , listing application number(s) .
- ☐ The 37 CFR 1.78(c)(2) reference on the application data sheet does not provide the U.S. nonprovisional application number (series code and serial number) or, with respect to an international PCT application designating the U.S., it provides the international application number or international filing date but not both. See document coded dated , in which the following is missing: .
- ☐ The 37 CFR 1.78(c)(2) reference on the application data sheet shows an incorrect, incomplete, or illegible U.S. nonprovisional application number, international PCT application number, or international PCT filing date. See document coded dated , in which the following error was made: .
- ☐ The 37 CFR 1.78(c)(2) reference to the prior U.S. nonprovisional application or international application designating the U.S. is not present on an application data sheet, thus removing the validating link under 35 U.S.C. 119(a)-(d) to a prior foreign application or under 35 U.S.C. 119(e) to a prior U.S. provisional application.
- ☐ The 37 CFR 1.78(c)(2) reference to the prior U.S. nonprovisional application or international application designating the U.S. is not present on an application data sheet.
- ☒ The 37 CFR 1.78(a)(3) reference to the prior U.S. provisional application is not present on an application data sheet.
- ☐ The 37 CFR 1.78(a)(3) reference to the prior U.S. provisional application on an application data sheet does not provide the provisional application number (series code and serial number). See document coded dated , in which the following is missing: .
- ☐ The 37 CFR 1.78(a)(3) reference to the prior U.S. provisional application on an application data sheet shows an incorrect, incomplete, or illegible U.S. provisional application number. See document coded dated , in which the following error was made: .
- ☐ Other: .

HOW TO RESPOND

A proper response to this notice would include: (1) a corrected Application Data Sheet (ADS) pursuant to 37 CFR 1.76(c) which provides the benefit information from the attached filing receipt which would make the benefit information comply with 37 CFR 1.78(c)(2) or 37 CFR 1.78(a)(3) or (2) a petition filed pursuant to the provisions of 37 CFR 1.78(b) or 37 CFR 1.78(d) if the benefit information from the attached filing receipt does not accurately reflect the benefits under 35 U.S.C. 119(e), 120, 121 or 365(c) as claimed by applicant (a grantable petition would include a corrected ADS as required by 37 CFR 1.78(b)(1) or 37 CFR 1.78(d)(1)).

WARNING: If Applicant fails to timely submit a proper response, the benefit information will be deleted and the patent will be printed without the benefit information present.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor : Nicholas B. Larsson et al.	Confirmation No.: 5445
Appln. No. : 14/009,955	Group Art Unit: 2883
Filed : October 4, 2013	Examiner: Jerry M. Blevins
For : OPTICAL FIBER CABLE DROP INTERFACE BOX	
Docket No. : C64.12-0053	

**RESPONSE TO NOTICE TO FILE CORRECTED
APPLICATION PAPERS**

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being facsimile transmitted to the USPTO, EFS-Web transmitted to the USPTO, or deposited with the United States Postal Service with sufficient postage in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on FEBRUARY 6, 2015.

Signature /John D. Veldhuis-Kroeze/

Printed Name JOHN D. VELDHUIS-KROEZE

Sir:

In response to the Notice to File Corrected Application Papers dated January 30, 2015, Applicant encloses the following documents to complete the above-identified patent application filed October 4, 2013:

1. Corrected Application Data Sheet.

The Director is authorized to charge payment of any additional fees associated with this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KOEHLER, P.A.

By: /John D. Veldhuis-Kroeze/
John D. Veldhuis-Kroeze, Reg. No. 38,354
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3244
Phone: (612) 334-3222
Fax: (612) 334-3312

JVK/eja

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Nicholas	B.	Larsson		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Blomkest	State/Province	MN	Country of Residence	US
Citizenship under 37 CFR 1.41(b)		US			
Mailing Address of Applicant:					
Address 1		219 Schendel Street			
Address 2		PO Box 152			
City	Blomkest	State/Province	MN		
Postal Code	56216	Country	US		
Applicant 2					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Andrew	E.	Swienton		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Plymouth	State/Province	MN	Country of Residence	US
Citizenship under 37 CFR 1.41(b)		US			
Mailing Address of Applicant:					
Address 1		4570 Ranier Court North			
Address 2					
City	Plymouth	State/Province	MN		
Postal Code	55446	Country	US		
Applicant 3					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	George	I.	Wakileh		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Batavia	State/Province	IL	Country of Residence	MN

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		

Citizenship under 37 CFR 1.41(b)	US		
Mailing Address of Applicant:			
Address 1	440 Judd Lane		
Address 2			
City	Batavia	State/Province	IL
Postal Code	60510	Country	US
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence information of this application.	
Customer Number	27367
Email Address	<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
Attorney Docket Number	C64.12-0053	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	17	Suggested Figure for Publication (if any)	

Publication Information:

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

Representative Information:

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		
Customer Number	27367		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/US2012/032320	2012-04-05
Prior Application Status		<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61472008	2011-04-05
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

<input type="button" value="Remove"/>		
Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)
		☐ Yes ☒ No
Additional Foreign Priority Data may be generated within this form by selecting the Add button.		

Assignee Information:

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

Assignee 1			
If the Assignee is an Organization check here. ☒			
Organization Name	Communications Systems, Inc.		
Mailing Address Information:			
Address 1	1001 East Highway 212		
Address 2			
City	Hector	State/Province	MN
Country	US	Postal Code	55342
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	C64.12-0053
		Application Number	
Title of Invention	OPTICAL FIBER CABLE DROP INTERFACE BOX		

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/John Veldhuis-Kroeze/			Date (YYYY-MM-DD)	2015-02-06
First Name	John	Last Name	Veldhuis-Kroeze	Registration Number	38354

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

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt	
EFS ID:	21425206
Application Number:	14009955
International Application Number:	
Confirmation Number:	5445
Title of Invention:	OPTICAL FIBER CABLE DROP INTERFACE BOX
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Emily Ashlin
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	06-FEB-2015
Filing Date:	04-OCT-2013
Time Stamp:	16:26:18
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment		no			
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	2015-02-06ResponsetoNotice.pdf	22567 5e4f6e88ea7a6c2697ee0cd902bb125db4a c8cf1	no	1
Warnings:					
Information:					

2	Application Data Sheet	2015-02-06CorrectedADS.pdf	98424 d4786b800d033d6f7d055063191789eb940295a1	no	5
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
Total Files Size (in bytes):			120991		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

27367 7590 12/15/2014
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	10/04/2013	Nicholas B. Larsson	C64.12-0053	5445

TITLE OF INVENTION: OPTICAL FIBER CABLE DROP INTERFACE BOX

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	03/16/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
BLEVINS, JERRY M	2883	385-135000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

- 1 John D. Veldhuis-Kroeze
 2 Westman, Champlin & Koehler, P.A.
 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Communications Systems, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Hector, Minnesota

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 23-1123 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /John Veldhuis-Kroeze/

Date March 11, 2015

Typed or printed name John D. Veldhuis-Kroeze

Registration No. 38,354

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	: Nicholas B. Larsson et al.	Confirmation No.:	5445
Appln. No.	: 13/009,955	Group Art Unit:	2883
Filed	: October 4, 2013	Examiner:	Jerry M Blevins
For	: OPTICAL FIBER CABLE DROP INTERFACE BOX		
Docket No.	: C64.12-0053		

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being facsimile transmitted to the USPTO, EFS-Web transmitted to the USPTO, or deposited with the United States Postal Service with sufficient postage in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on MARCH 11, 2015.

Signature /John D. Veldhuis-Kroeze/

Printed Name John D. Veldhuis-Kroeze

Sir:

The Applicant agrees with the Examiner's Statement of Reasons for Allowance to the extent that the claims of the present invention are patentable over the references in the record. The Applicant expressly traverses the Examiner's Statement of Reasons for Allowance to the extent that any comment is intended or has the effect of limiting a claim scope, explicitly or implicitly, by not reciting verbatim and/or in complete context, the respective claim language, or is intended or has the effect of limiting a claim scope by stating or implying that all the reasons of patentability are in any way fully enumerated.

The Director is authorized to charge any fee deficiency required by this paper to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KOEHLER, P.A.

By: /John D. Veldhuis-Kroeze/
John D. Veldhuis-Kroeze, Reg. No. 38,354
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3244
Phone: (612) 334-3222
Fax: (612) 334-3312

JVK/eja

Electronic Patent Application Fee Transmittal				
Application Number:		14009955		
Filing Date:		04-Oct-2013		
Title of Invention:		OPTICAL FIBER CABLE DROP INTERFACE BOX		
First Named Inventor/Applicant Name:		Nicholas B. Larsson		
Filer:		John Douglas Veldhuis-Kroeze/Emily Ashlin		
Attorney Docket Number:		C64.12-0053		
Filed as Small Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				480

Electronic Acknowledgement Receipt	
EFS ID:	21735326
Application Number:	14009955
International Application Number:	
Confirmation Number:	5445
Title of Invention:	OPTICAL FIBER CABLE DROP INTERFACE BOX
First Named Inventor/Applicant Name:	Nicholas B. Larsson
Customer Number:	27367
Filer:	John Douglas Veldhuis-Kroeze/Emily Ashlin
Filer Authorized By:	John Douglas Veldhuis-Kroeze
Attorney Docket Number:	C64.12-0053
Receipt Date:	11-MAR-2015
Filing Date:	04-OCT-2013
Time Stamp:	12:45:38
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$480
RAM confirmation Number	9969
Deposit Account	231123
Authorized User	VELDHUIS-KROEZE, JOHN D.
<p>The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:</p> <p>Charge any Additional Fees required under 37 C.F.R. 1.492 (National application filing, search, and examination fees)</p> <p>Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)</p>	

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

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2015-03-11IF.pdf	100208 1ba5563884eb66e23005bc542e18001d8bf72ec4	no	1

Warnings:

Information:

2	Miscellaneous Incoming Letter	2015-03-11Comments.pdf	23009 89fd9da749dc4ab3b819b9c5e3620e300b5bca7	no	1
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Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	30732 52814966ef4baf7aeea7791e063b06a8cba3fa8	no	2
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Warnings:

Information:

Total Files Size (in bytes):			153949
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

New International Application Filed with the USPTO as a Receiving Office

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



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/009,955	04/14/2015	9008483	C64.12-0053	5445

27367 7590 03/25/2015
WESTMAN CHAMPLIN & KOEHLER, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Nicholas B. Larsson, Blomkest, MN;
Andrew E. Swienton, Plymouth, MN;
George I. Wakileh, Batavia, IL;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.