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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
62/047,773	09/09/2014		130	SHOALS-58		

CONFIRMATION NO. 9035

FILING RECEIPT

57825
CARLA GANNON LAW
Carla L. Gannon, Esq.
8903 E. Oak Island Dr.
Suite 9
Oak Island, NC 28465



Date Mailed: 09/25/2014

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. 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)

Dean Solon, Gallatin, TN;

Applicant(s)

Dean Solon, Gallatin, TN;

Power of Attorney:
Carla Gannon--56358

If Required, Foreign Filing License Granted: 09/24/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/047,773**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

PRE-PANELIZED THIN FILM, RACK, CONNECTORLESS DUAL CORDPLATE, MOBILE SKIDGET, POWERHOUSE AND BLA TRUNK BUSS

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent

in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 01/31/2014 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1 — Remove

Given Name	Middle Name	Family Name	City	State	Country
Dean		Solon	Gallatin	TN	US

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Title of Invention	PRE-PANELIZED THIN FILM, RACK, CONNECTORLESS DUAL CORDPLATE, MOBILE SKIDGET, POWERHOUSE AND BLA TRUNK BUSS
Attorney Docket Number (if applicable)	SHOALS-58

Correspondence Address

Direct all correspondence to (select one):

◉ The address corresponding to Customer Number	○ Firm or Individual Name
Customer Number	57825

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

◉ No.

○ Yes, the name of the U.S. Government agency and the Government contract number are:

Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 01/31/2014 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Entity Status

Applicant claims small entity status under 37 CFR 1.27

- (●) Yes, applicant qualifies for small entity status under 37 CFR 1.27
- ( ) No

Warning

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Carla L. Gannon/			Date (YYYY-MM-DD)	2014-09-09
First Name	Carla	Last Name	Gannon	Registration Number (If appropriate)	56358

This collection of information is required by 37 CFR 1.51. 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 8 hours 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. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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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 paten. 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, t o a n other 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.


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Harnessing Your Potential

Shoals Technologies Group LLC

Pre-panelized Thin Film "Super Module™" & GMT Rack for Portrait Orientation for FSLR Series 4™

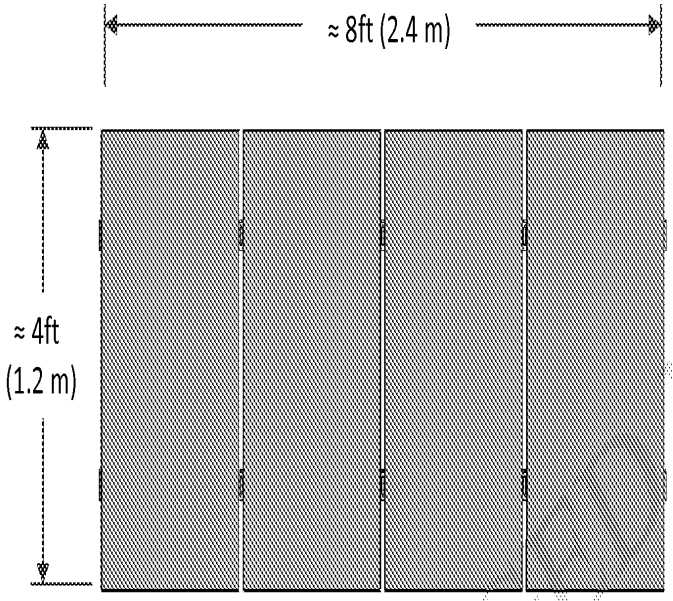
STG® Connector-less Dual Cordplate Concept

STG® Mobile Skidget™

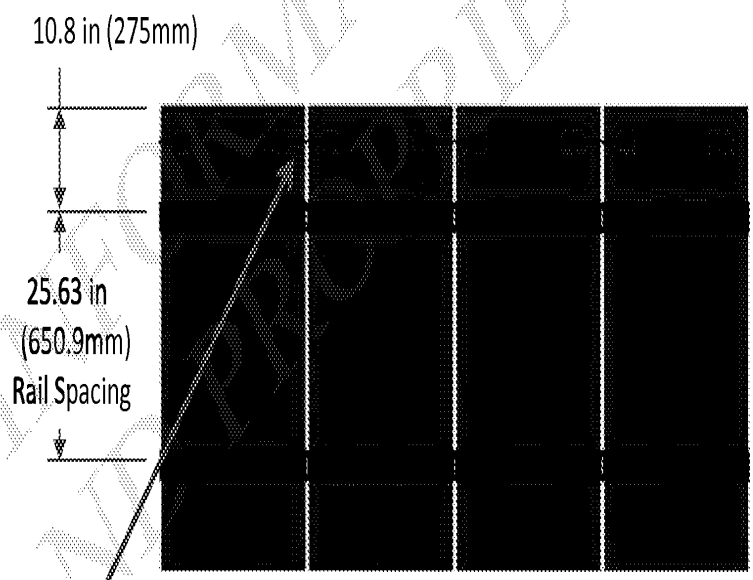
STG® PowerHouse™

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4-Module Pre-panelized "Super Module™"



Top View



Bottom View

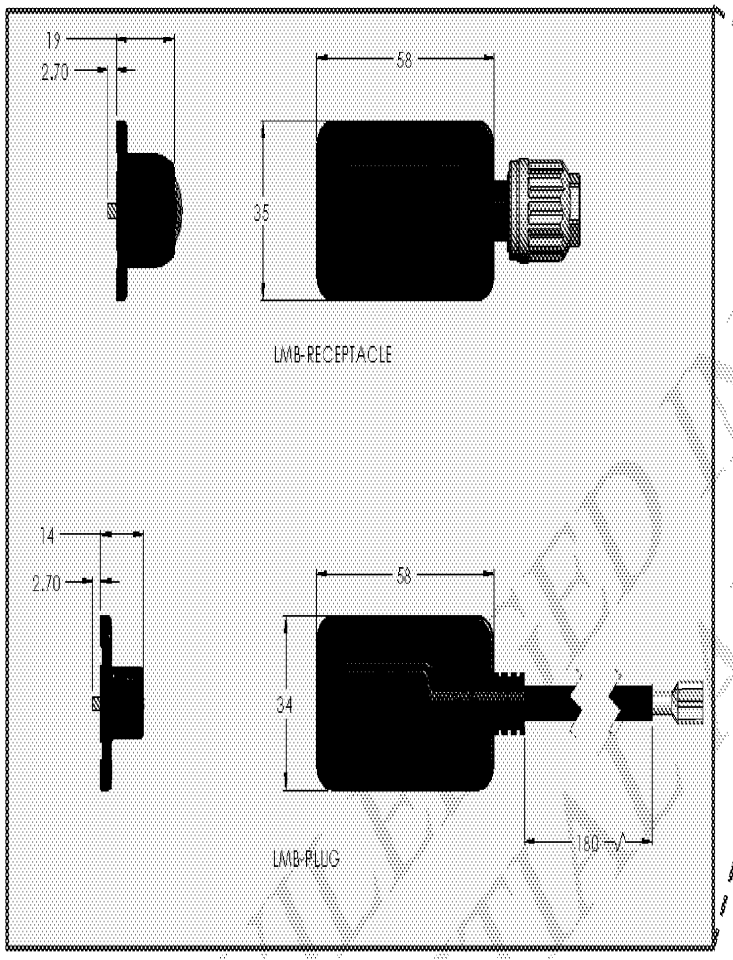
A four-module pre-panelized "Super Module™" is composed of four (4) glass-on-glass thin film modules that are adhered directly to rails with electrical connection made with the Connector-less STG Dual Cordplate Concept.

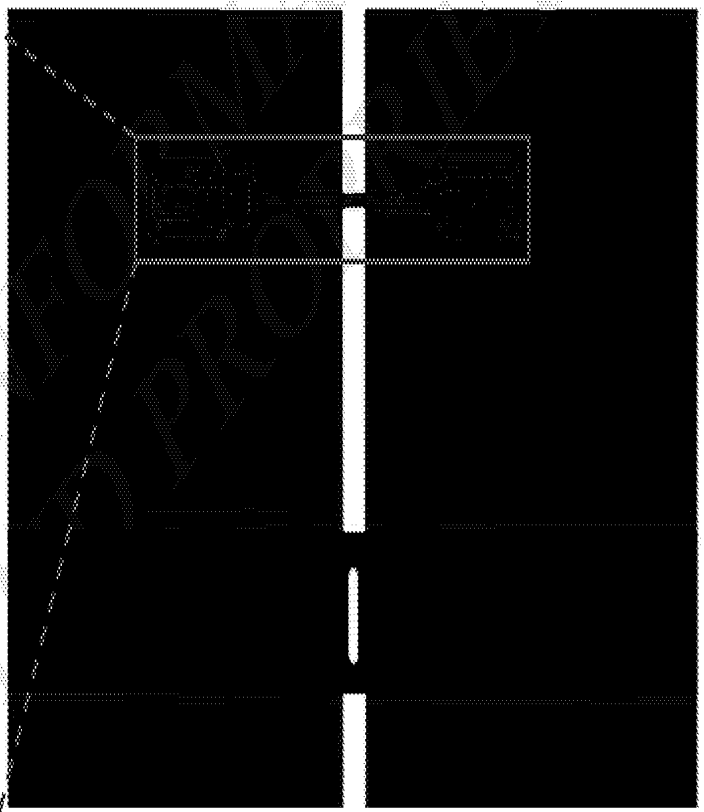
Power rating = 4 X 90W = 360W / Super Module
Module mass = 26 lb (12 kg)
Rail mass = 15 lb (6.8 kg)
Super Module mass = ~134 lb (61 kg)

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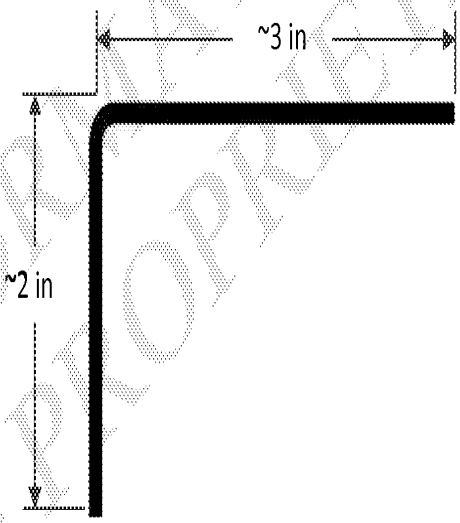
STG® Connector-less Dual Cordplate Concept



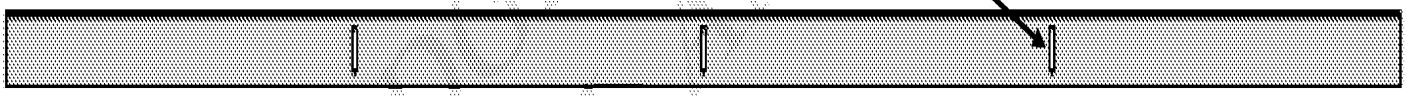


Proof of Concept Rail Design

The proof of concept rail design is a "standard" (off-the-shelf) 12GA 36ksi G90 pre-galvanized steel angle profile that is approximately 2 in x 3 in x 97.5 in long and has slots cut into the 3 in wide flange and holes punched/drilled into the 2 in wide flange. This design was chosen because we want to test out the handling and manageability of the Super Module and because we needed it to mate to an existing Rack.

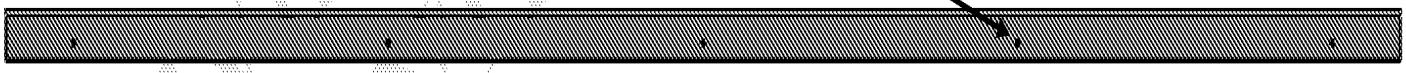


Slots on the top flange for fastening hardware attachment to horizontal purlins.



Top View

Holes on the side flange for attachment of cable management clips

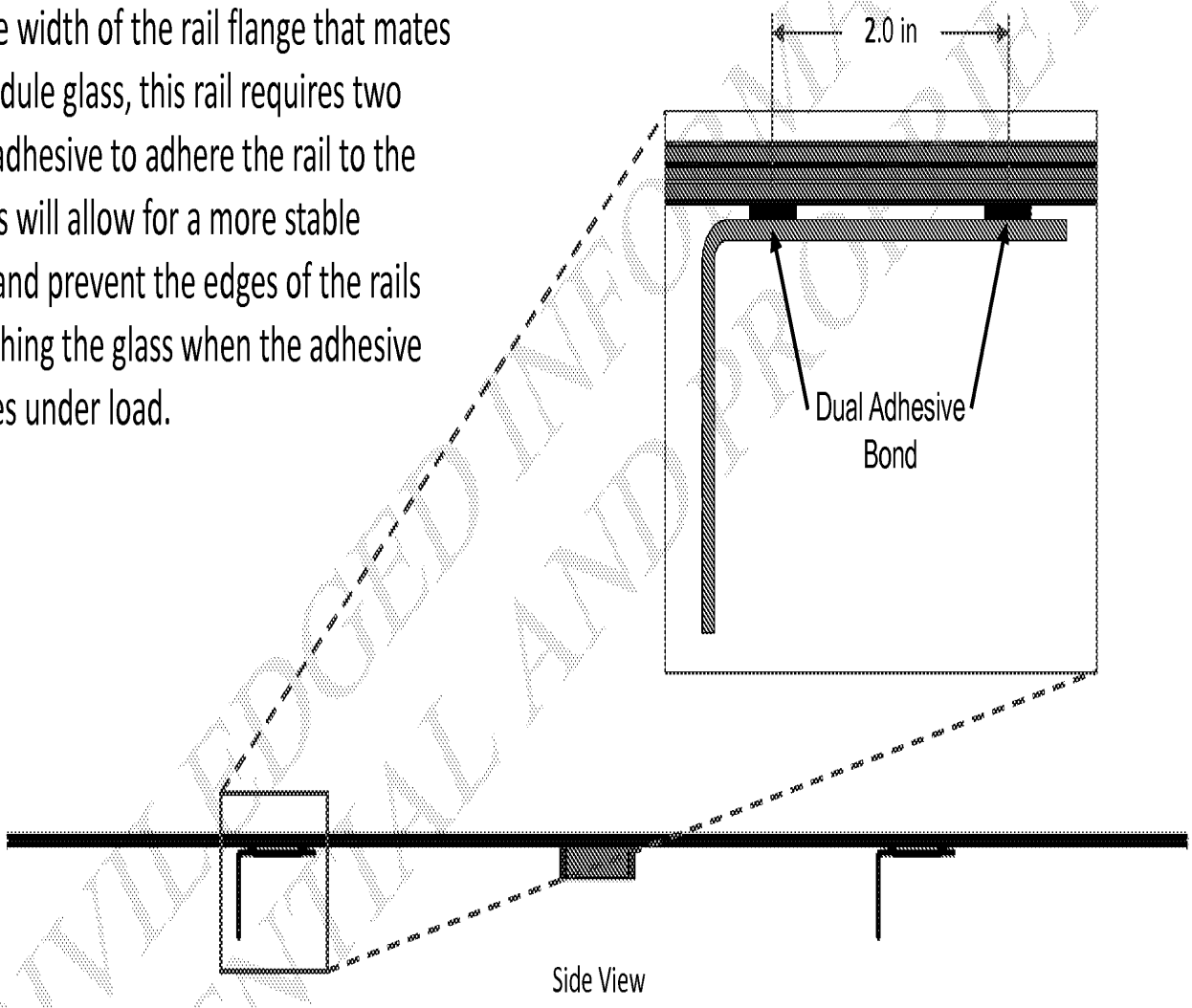


Back View

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Rail & Adhesive Detail

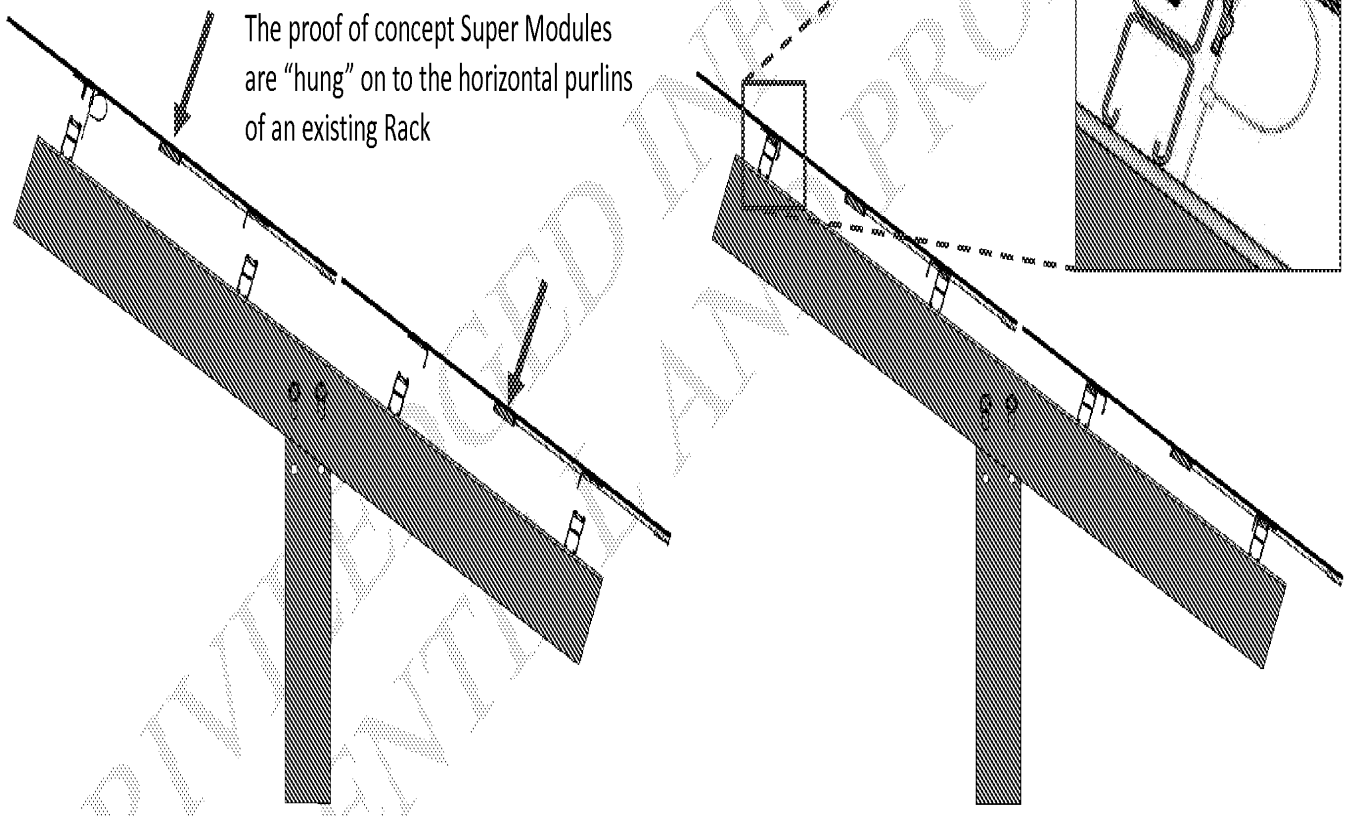
Due to the width of the rail flange that mates to the module glass, this rail requires two beads of adhesive to adhere the rail to the glass. This will allow for a more stable platform and prevent the edges of the rails from touching the glass when the adhesive bead flexes under load.



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Proof of Concept Installation

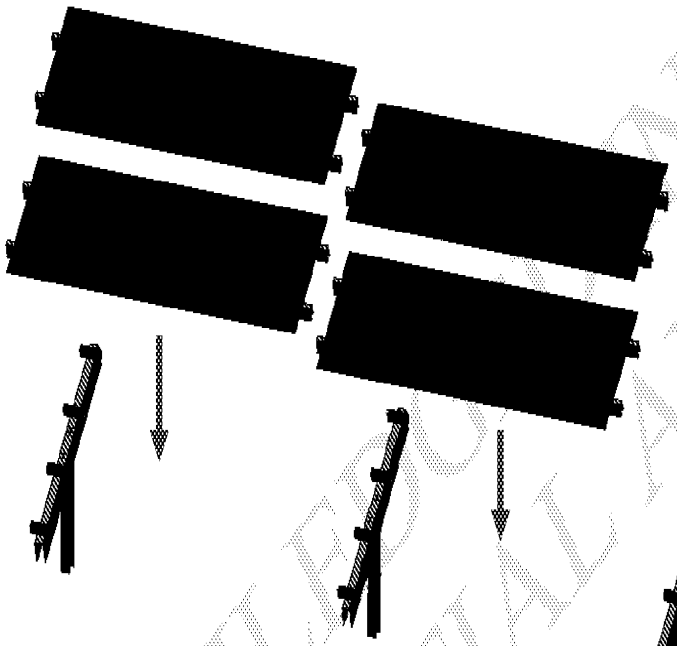
The proof of concept Super Modules mount to the horizontal purlins of an existing Rack already installed in the field. The Super Module™ is "hung" on them and then secured to them with self-drilling screws.



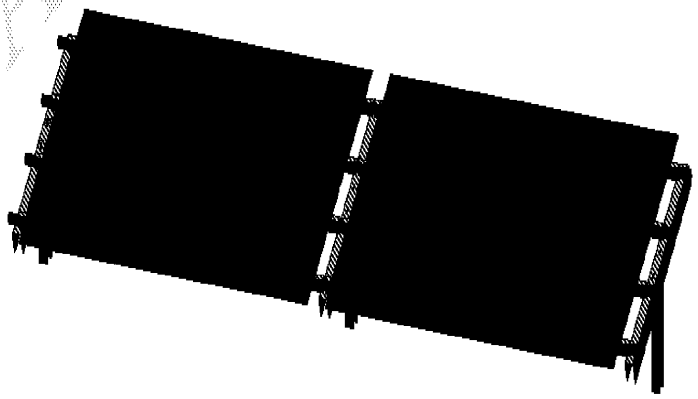
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Super Module™ GMT Rack

Once the Super Module™ concept is proven, the next step is to develop a Super Module™ GMT Rack where the Super Modules™ mount directly to the Tilt Bracket & Post assemblies, without the need for traditional purlins. 3-item Rack that consists of a Post, a Tilt Bracket assembly, and Super Module™.



Factory pre-assembled Super Modules mount directly to Tilt Bracket & Post assemblies. The result is a >25% reduction in Racking components.

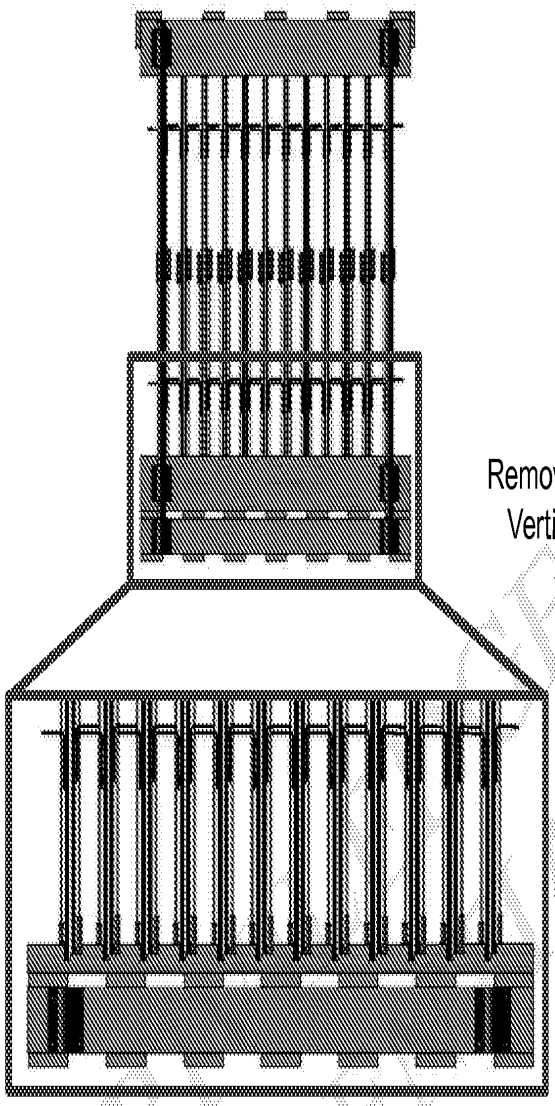


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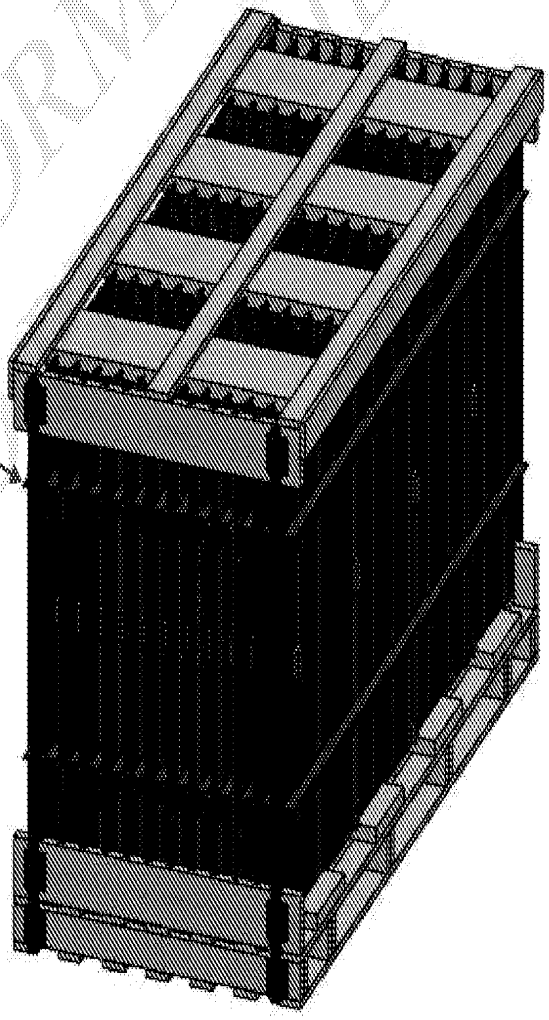
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Proof of Concept Reusable Vertical Stack

24 Super Modules (96 modules) per reusable stack



Removable Pipes Support Vertical Load of Stacked Pallets/Crates



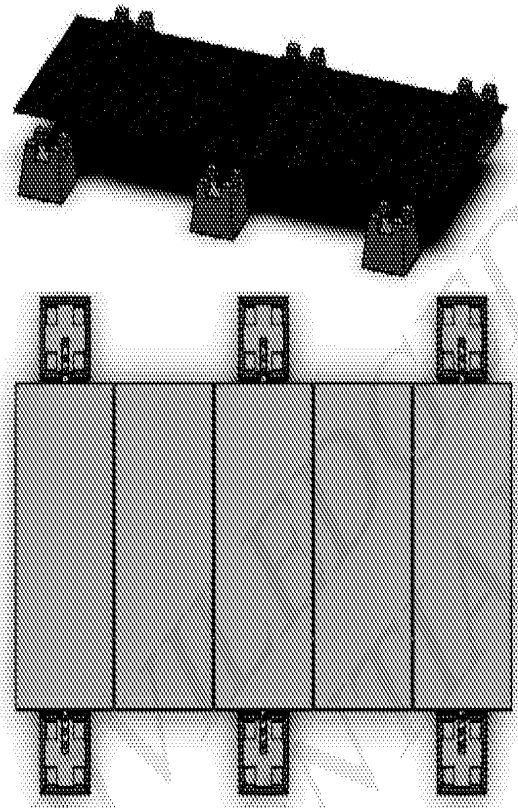
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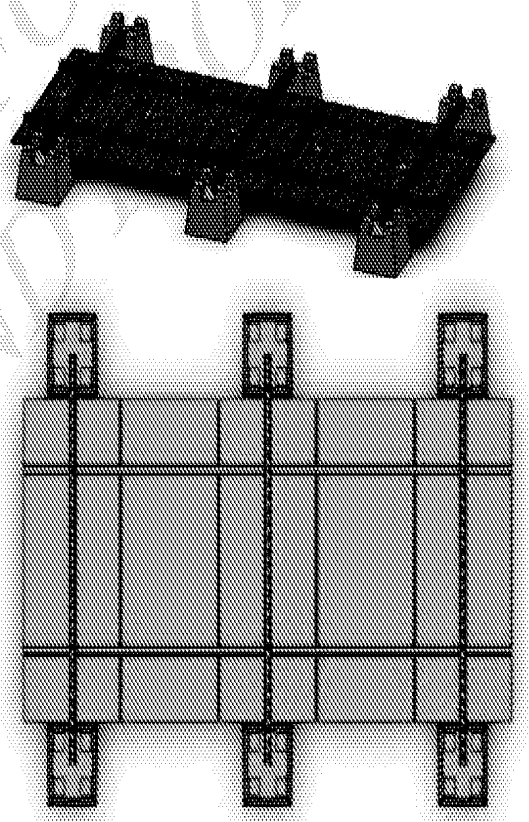
Mechanical Load Test Setup

To validate that a liquid adhesive bond is equal or stronger than traditional thin film module mounting methods, two proof-of-concept units will need to be subjected to a standard test protocol. A great starting point would be that of a Mechanical Load Test as defined in IEC 61646, Section 10.16 and a Module Breakage Test as defined in IEC 61730-2, Section 10.10.

Positive Loading Configuration



Negative Loading Configuration



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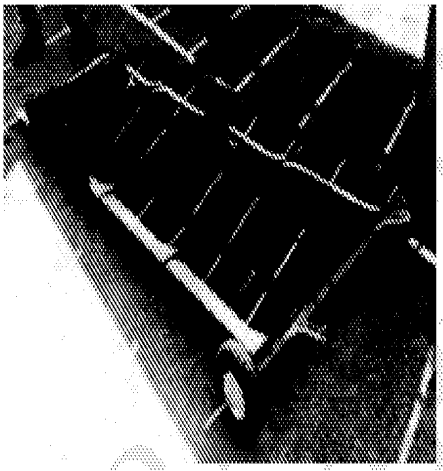
PROOF OF CONCEPT FIELD TEST

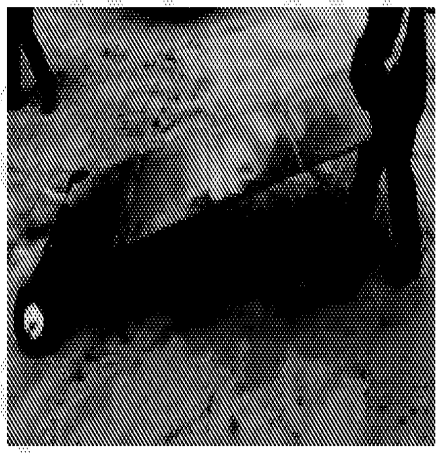


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"Solar Dolly"

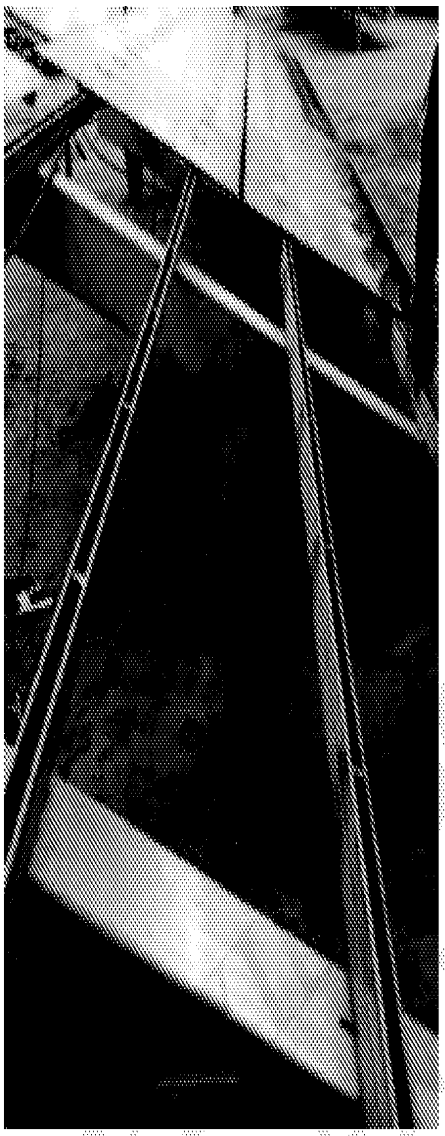
A proof of concept "solar dolly" or "super module dolly" was fabricated to explore alternate methods of transporting Super Modules from their staging location.

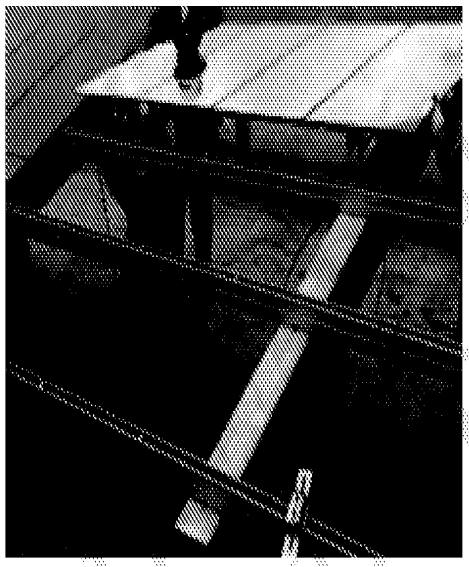





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Super Module Handling & Manageability









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STG® Mobile Skidget™



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STG® Mobile Skidget™



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STG® PowerHouse™



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STG® PowerHouse™



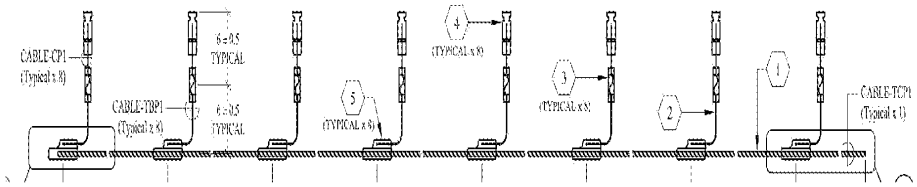
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Harnessing Your Potential

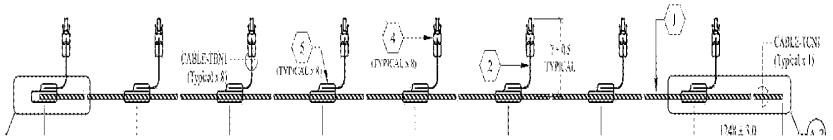
SHOALS BLA TRUNK BUSS

The Shoals BLA Trunk Buss negates the need for deploying combiner boxes into the solar field by incorporating a proprietary “T” into the existing DC feeder cables needed onsite. This pre-manufactured harness offers a significant cost savings both in initial product cost as well as in the realized labor savings due to its ease of implementation. This system utilizes the same under/overmold construction currently deployed in the field today, but on a much larger scale. Can be integrated onto any feeder cable size EX: 750MCM. It is designed for the harshest environment including direct burial applications. The same topology not only applies to the DC feeders, but can also be implemented into the feeders deployed in AC systems negating the need to AC Recombiners.

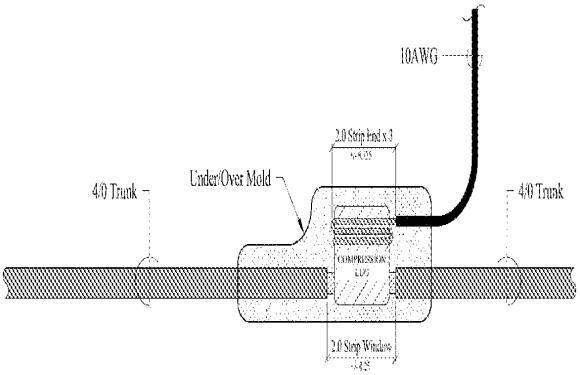
CONFIDENTIAL



TYPICAL POSITIVE HARNESS

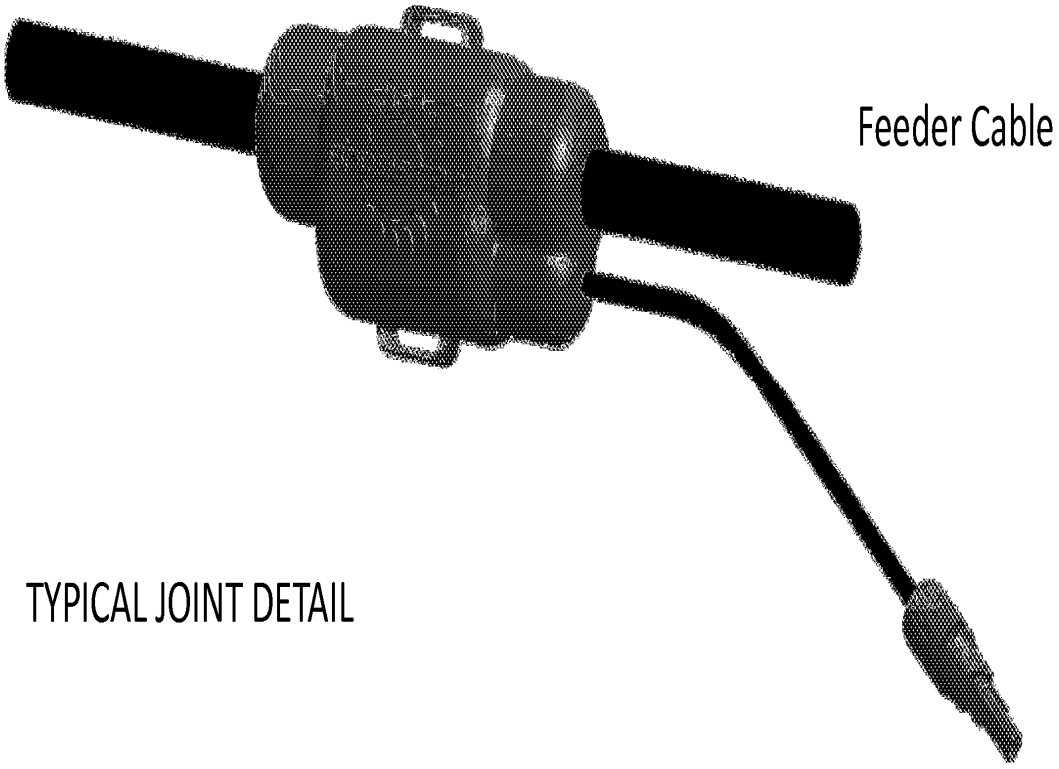


TYPICAL NEGATIVE HARNESS



TYPICAL JOINT DETAIL

DC feeder “T” joint



TYPICAL JOINT DETAIL

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PRE-PANELIZED THIN FILM, RACK, CONNECTORLESS DUAL CORDPLATE, MOBILE SKIDGET, POWERHOUSE AND BLA TRUNK BUSS
First Named Inventor/Applicant Name:	Dean Solon
Filer:	Carla L. Gannon/Donna Riccardi
Attorney Docket Number:	SHOALS-58

Filed as Small Entity

Provisional Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Provisional Application Filing Fee	2005	1	130	130
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**130**

Electronic Acknowledgement Receipt

EFS ID:	20084389
Application Number:	62047773
International Application Number:	
Confirmation Number:	9035
Title of Invention:	PRE-PANELIZED THIN FILM, RACK, CONNECTORLESS DUAL CORDPLATE, MOBILE SKIDGET, POWERHOUSE AND BLA TRUNK BUSS
First Named Inventor/Applicant Name:	Dean Solon
Customer Number:	57825
Filer:	Carla L. Gannon/Donna Riccardi
Filer Authorized By:	Carla L. Gannon
Attorney Docket Number:	SHOALS-58
Receipt Date:	09-SEP-2014
Filing Date:	
Time Stamp:	12:37:03
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$130
RAM confirmation Number	10809
Deposit Account	506268
Authorized User	GANNON, CARLA L

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

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)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	ProvisionalCoversheet_SHOALS-58.pdf	117916 a920ba6bfee87bda99152f2324f23b17c5d4a4a0	no	3
Warnings:					
This is not a USPTO supplied Provisional Cover Sheet SB16 form.					
Information:					
2	Specification	Application_SHOALS-58.pdf	5541371 047ee4c0ad36373edac3ab93cf9469d31e292bf2	no	21
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29749 c4f6735a2ad389141bc0ebe083041284a51a5d01	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5689036		

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<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.

<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.