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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873
97149	7590	06/18/2024	EXAMINER	
Maschoff Brennan 1389 Center Drive, Ste. 300 Suite 300 Park City, UT 84098			CANNON, RYAN SMITH	
			ART UNIT	PAPER NUMBER
			1726	
			NOTIFICATION DATE	DELIVERY MODE
			06/18/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

bisraelsen@mabr.com
d@mabr.com

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/341,655	18-Jun-2024	12015375

Maschoff Brennan
1389 Center Drive, Ste. 300
Park City, UT 84098

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at <https://patentcenter.uspto.gov>

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit <https://www.uspto.gov/electronicgrants>



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/18/2024	12015375	S4079.10001US04	4873

97149 7590 05/29/2024
Maschoff Brennan
1389 Center Drive, Ste. 300
Suite 300
Park City, UT 84098

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at <https://patentcenter.uspto.gov/>. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at <https://certifiedcopycenter.uspto.gov/index.html>. The Certified Copy Center may be reached at (800)972-6382.

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 Center (<https://patentcenter.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 Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site <https://patentcenter.uspto.gov> for additional inventors):

Dean Solon, Gallatin, TN;

APPLICANT(s) (Please see PATENT CENTER site <https://patentcenter.uspto.gov> for additional applicants):

SHOALS TECHNOLOGIES GROUP, LLC, Portland, TN;

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.

Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	1	Of	6	Attorney Docket Number	S4079.10001US04

U.S. PATENTS						
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.	2,700,085		1955-01-18	Breisch et al.	
	2.	2,808,487		1957-10-01	Jacobs	
	3.	3,085,138		1963-04-09	Brown et al.	
	4.	3,086,242		1963-04-23	Cook et al.	
	5.	3,243,211		1966-03-29	Wetmore	
	6.	3,296,399		1967-01-03	Kozacka	
	7.	3,559,141		1971-01-26	Hardy	
	8.	3,678,432		1972-07-18	Boliver	
	9.	3,686,603		1972-08-22	Lockie et al.	
	10.	3,686,604		1972-08-22	Link et al.	
	11.	3,781,745		1973-12-25	Vadnagara	
	12.	3,795,757		1974-03-05	Higgins	
	13.	3,818,407		1974-06-18	Edgerton	
	14.	3,946,351		1976-03-23	Bronikowski et al.	
	15.	4,060,785		1977-11-29	Hanke et al.	
	16.	4,251,304		1981-02-17	Campbell et al.	
	17.	4,308,515		1981-12-29	Rooney et al.	
	18.	4,625,196		1986-11-25	Muench et al.	
	19.	4,778,948		1988-10-18	Fitch et al.	
	20.	4,780,598		1988-10-25	Fahey et al.	
	21.	4,947,149		1990-08-07	Pimpis et al.	
	22.	5,316,502		1994-05-31	Loet	
	23.	5,726,851		1998-03-10	Knapp	
	24.	5,903,209		1999-05-11	Stepniak	
	25.	7,387,537		2008-06-17	Daily	
	26.	7,422,458		2008-05-22	Arai	
	27.	8,207,637		2012-06-26	Marroquin et al.	
Change(s) applied to document, /M.D./ 3/15/2024	28.	8,242,874		2000-12-17	Pavlovic et al.	08/2012
	29.	8,289,123		2007-01-25	Whitney et al.	10/2012
	30.	8,632,358		2014-01-21	Leonhard et al.	
	31.	8,657,624		2014-02-25	Yoshida	
	32.	8,699,209		2014-04-15	Barna	
	33.	8,723,370		2014-05-13	West	
	34.	8,779,627		2014-07-15	Gerhardinger et al.	

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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 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. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

97149 7590 03/06/2024
Maschoff Brennan
1389 Center Drive, Ste. 300
Suite 300
Park City, UT 84098

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 transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873

TITLE OF INVENTION: LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	XXXX Large	\$480	\$0.00	\$0.00	XXX \$1200	06/06/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
CANNON, RYAN SMITH	1726	136-244000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or 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 MASCHOFF BRENNAN

2 Paul G. Johnson

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

SHOALS TECHNOLOGIES GROUP, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Portland, Tennessee

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 50-5394

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 /Paul G. Johnson, Reg. # 58,539/

Date May 7, 2024

Typed or printed name Paul G. Johnson

Registration No. 58,539

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Dean Solon	Art Unit 1726
Application No.:	18/341,655	
Filed:	June 26, 2023	
Conf. No.:	4873	
For:	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER	
Examiner:	Ryan Smith Cannon	
Customer No.:	97149	
Attorney Docket No.:	S4079.10001US04	

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

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

Dear Commissioner:

Applicant acknowledges Examiner's statements of Reasons for Allowance of the above-referenced patent application and agrees that the claimed subject matter is patentable. However, Applicant takes no position regarding the Reasons for Allowance presented by the Examiner other than the positions Applicant may have previously taken during prosecution. Applicant submits that it is the claim as a whole, rather than any particular limitation, that makes each of the claims in the above-identified application allowable. No single limitation should be construed as the reason for allowance of a claim because it is each of the elements of the claim that makes it allowable.

The Examiner's Reasons for Allowance should not be attributed to Applicant as an indication of the basis for Applicant's belief that the claims are patentable. Furthermore, there may be additional reasons for patentability of the claimed subject matter, whether or not explicitly

stated in this record, and Applicant expressly reserves the right to make these and other arguments in the future.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 50-5394: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 50-5394.

Dated this 7th day of May, 2024.

Respectfully submitted,

/Paul G. Johnson/ Reg. # 58539

PAUL G. JOHNSON
Registration No. 58539
Attorney for Applicant
Customer No. 97149
Telephone No. (435) 252-1360



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

ACKNOWLEDGEMENT OF LOSS OF ENTITLEMENT TO ENTITY STATUS DISCOUNT

APPLICATION #	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET #	REQUEST ID
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	211370

The entity status change request below filed through Patent Center on 05/07/2024 has been accepted.

Certifications

APPLICANT CHANGING TO REGULAR UNDISCOUNTED FEE STATUS

Signature

I certify, in accordance with 37 CFR 1.4(d)(4), that I am one of the signatories making the entity status change.

Signature	Name	Registration #
/Paul G. Johnson/	Paul Johnson	58539



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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

97149 7590 03/06/2024
Maschoff Brennan
1389 Center Drive, Ste. 300
Suite 300
Park City, UT 84098

EXAMINER

CANNON, RYAN SMITH

ART UNIT

PAPER NUMBER

1726

DATE MAILED: 03/06/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873

TITLE OF INVENTION: LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0.00	\$0.00	\$480	06/06/2024

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 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted 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. 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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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 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. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

97149 7590 03/06/2024

Maschoff Brennan
1389 Center Drive, Ste. 300
Suite 300
Park City, UT 84098

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 transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873

TITLE OF INVENTION: LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

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nonprovisional	SMALL	\$480	\$0.00	\$0.00	\$480	06/06/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
CANNON, RYAN SMITH	1726	136-244000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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.

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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. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873
97149	7590	03/06/2024	EXAMINER	
Maschoff Brennan 1389 Center Drive, Ste. 300 Suite 300 Park City, UT 84098			CANNON, RYAN SMITH	
			ART UNIT	PAPER NUMBER
			1726	
DATE MAILED: 03/06/2024				

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 30 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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).

<https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to:

- 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
- 2) a federal, state, local, or international agency, in response to its request;
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- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
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- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) 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));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/341,655	Applicant(s) Solon, Dean	
	Examiner Ryan S Cannon	Art Unit 1726	AIA (FITF) Status Yes

-- 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 2/22/2024.
☐ 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 4-26. 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/pph/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)	5. ☒ Examiner's Amendment/Comment
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>1/19/24(2)</u> .	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☒ Other <u>Email exchange and appendices</u> .
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date. <u>20240229</u> .	

/RYAN S CANNON/ Primary Examiner, Art Unit 1726	
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Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with Paul Johnson on 2/28/2024.

The application has been amended as follows:

In claim 1:

Please change "feeder cable." in the last line to --feeder cable; wherein the one or more drop line pathways and the feeder pathway extend parallel to one another within the nexus, and the monolithic mold has distinct openings at ends of the feeder pathway and one or more drop line pathways through which the one or more drop lines and the feeder cable exit the monolithic mold.--.

In claim 17:

Please change "feeder pathway." in the last line to --feeder pathway; and wherein at least a portion of the first drop line pathway and at least a portion of the second drop line pathway extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway.--.

In claim 22:

Please change "feeder pathway." in the last line to --feeder pathway; and wherein at least a portion of the first drop line pathway and at least a portion of the second drop line pathway extend in

opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway.--

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: JP2015-198508A, JP2014-050227A (of record), US Patent 3,852,516 (of record), US Patent 4,464,583, and US Patent 3,700,786 each teach some of the claim limitations. However, these references, alone or in combination with other prior art, do not anticipate or render obvious the limitations of claims 1, 17, and 22 as amended. Therefore these claims, and other claims requiring the limitations of those claims, are clear, free of the art, and allowable.

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 Ryan S Cannon whose telephone number is (571)270-7186. The examiner can normally be reached M-F, 8:30am-5:30pm PST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Barton can be reached on (571) 272-1307. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ryan S. Cannon
Primary Examiner
Art Unit 1726

/RYANS CANNON/
Primary Examiner, Art Unit 1726

<i>Examiner-Initiated Interview Summary</i>	Application No. 18/341,655	Applicant(s) Solon, Dean		
	Examiner Ryan S Cannon	Art Unit 1726	AIA (First Inventor to File) Status Yes	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
Ryan S Cannon	Primary Examiner	Telephonic
Paul Johnson	Attorney	

Date of Interview: 28 February 2024

Issues Discussed:

Proposed Amendment(s)

Examiner Cannon proposed amendments to the claims to bring the application into condition for allowance (attached). Mr. Johnson returned counter-proposals, which are incorporated in this office action.

☒ Attachment

/RYAN S CANNON/ Primary Examiner, Art Unit 1726	
<p>Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04</p> <p>Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing</p>	

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Notice of References Cited	Application/Control No. 18/341,655		Applicant(s)/Patent Under Reexamination Solon, Dean	
	Examiner Ryan S Cannon		Art Unit 1726	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-4464583-A	1984-08-07	Holmgren; Nils V.	H01B9/029	439/736
*	B	US-3700786-A	1972-10-24	Lawrenson; Thomas	H01B7/08	174/72A
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N	JP-2015198508-A	2015-11-09	JP	SHINOHARA H	
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

Issue Classification 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

CPC						
Symbol					Type	Version
H02S	/	40	/	30	F	2014-12-01
H01R	/	9	/	03	I	2013-01-01
H01R	/	4	/	70	I	2013-01-01

CPC Combination Sets					
Symbol				Type	Set
/		/			

NONE (Assistant Examiner)		Total Claims Allowed: 24	
/RYAN S CANNON/ Primary Examiner, Art Unit 1726 (Primary Examiner)		29 February 2024 (Date)	O.G. Print Claim(s) 1
			O.G. Print Figure 54

Issue Classification 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

INTERNATIONAL CLASSIFICATION			
CLAIMED			
H02S40/30	/	40	/ 30
H01R9/03	/	9	/ 03
H01R4/70	/	4	/ 70
NON-CLAIMED			
	/		/

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 24	
/RYAN S CANNON/ Primary Examiner, Art Unit 1726 (Primary Examiner) _____ (Date) 29 February 2024		O.G. Print Claim(s) 1	O.G. Print Figure 54

Issue Classification 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE	Total Claims Allowed:	
(Assistant Examiner)	(Date)	24
/RYAN S CANNON/ Primary Examiner, Art Unit 1726	29 February 2024	O.G. Print Claim(s)
(Primary Examiner)	(Date)	1
		O.G. Print Figure
		54

<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

CPC - Searched*		
Symbol	Date	Examiner
H01L31/0422,0424,0482,0484,05	1/16/2014	ERS
E04D3/40	1/17/2014	ERS
H01L31/02013,02008,02021	7/1/2014	ERS
H02S40/00-38	5/23/2014	ERS
H01R4/187,18,70	11/30/2017	ERS
H01R3-13/All	4/17/2020	ERS
H01R11/11	4/17/2020	ERS
H01R4/021,023,5205	4/17/2020	ERS
H01R13/5205	4/17/2020	ers
H01R4/027,10	4/17/2020	ERS
H01R9/0509	4/17/2020	ERS
H02S40/30,36	6/16/2022	RS
H01R4/All	6/16/2022	RS
H01R9/All	6/16/2022	RS
H01R13/All	06/16/2022	RS
H01R24/All	06/16/2022	RS
H01R25/All	6/16/2022	RS

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

US Classification - Searched*			
Class	Subclass	Date	Examiner
52	173.3	7/16/2013	ERS
136	243-265	7/16/2013	ERS

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

Search Notes		
Search Notes	Date	Examiner
Keyword search in USPC subclasses, CPC subgroups, IPC subgroups (see EAST history for search strategy)	5/23/2017	ERS
Inventor search in DAV	5/24/2017	ERS
Keyword search in CPC subgroups (see EAST history for search strategy)	11/30/2017	ERS
Update inventor search in DAV	11/30/2017	ERS
Consulted Fritz Fleming in AU2836	9/13/2018	ERS
Keyword search in EAST databases (see EAST history for search strategy)	9/14/2018	ERS
Updated inventor search in DAV	9/18/2018	ERS
Updated inventor search in DAV	6/6/2019	ERS
Keyword search in EAST databases (see EAST history for search strategy)	6/6/2019	ERS
Search consult with Examiner James Harvey in AU 2833	4/16/2020	ERS
Keyword search in EAST databases (see EAST history for search strategy)	5/8/2020	ERS
Updated inventor search in DAV	5/8/2020	ERS
Updated inventor search in DAV	2/1/2021	ERS
Keyword search in CPC subgroups	6/16/2022	RS
Inventor search in DAV	6/16/2022	RS
Used AI "More Like This Document" tool in P2E2 Search on previously acquired art	2/27/2023	RSC
Updated inventor search	2/27/2023	RSC
Updated inventor search	3/13/2023	RSC
MLTD search of prior art	1/8/2024	RSC
Updated inventor search	1/8/2024	RSC
MLTD search of prior art	2/28/2024	RSC
Updated inventor search	2/28/2024	RSC

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
H02S40	30	2/1/2021	ERS
H01R9	03,0509	2/1/2021	ERS
H01R4	70,187,18,70,021,023,5205	2/1/2021	ERS
H01R11	11	2/1/2021	ERS
H01R3	All	2/1/2021	ERS
H01R4	70	3/13/2023	RSC
H01R9	03	3/13/2023	RSC
H02S40	30	3/13/2023	RSC
H02S40	30	2/24/2024	RSC
H01R9	03	2/24/2024	RSC
H01R4	70	2/24/2024	RSC

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18/523,464 proposed amendments

Claim 1:

In line 12, change “disposed about a region” to –disposed about and conforming to a region--.

After the last line, add –wherein, in the one or more mold structures, the first drop line and the second drop line extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder cable--.

Claim 22:

In line 9, change “disposed about a region” to –disposed about and conforming to a region--.

After the last line, add –wherein the drop line and the feeder cable extend parallel to one another away from the region of electrical interconnection, and the mold structure tapers to distinct apertures through which the drop line and the feeder cable exit the mold structure--.

Claim 27:

Before the second line, add –the drop line comprises a first drop line and the drop line connector comprises a first drop line connector;--

In line 9, change “the second drop line connector” to –the lead assembly comprises a second drop line and a second drop line connector, wherein the second drop line connector--.

Claim 28:

Before the 12th line, add –the drop line comprises a first drop line, the drop line connector comprises a first drop line connector, and the lead assembly comprises a second drop line and a second drop line connector;--

18/341,655 proposed amendments

Claim 1:

After the last line, add –wherein the one or more drop line pathways and the feeder pathway extend parallel to one another away from the nexus, and the monolithic mold tapers to distinct apertures through which the one or more drop lines and the feeder cable exit the monolithic mold--.

Claim 17:

After the last line, add –wherein the first drop line pathway and the second drop line pathway extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway--.

Claim 22:

After the last line, add –wherein the first drop line pathway and the second drop line pathway extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway--.

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L833	34	(Artificial Intelligence) More like doc: US-2299140-A Text: (DE-4026718-A1 OR IE-912988-A1 OR WO-9203832-A1 OR DE-4026718-C2 OR GB-548221-A OR DE-4026718-C3 OR PT-98763-A OR US-2798899-A OR TN-SN91076-A1 OR US-2427507-A OR US-2881243-A OR JP-S5833617-Y2 OR US-2253138-A OR US-2479919-A OR DE-2550184-A1 OR US-3793476-A OR GB-2286294-A OR US-308890-A OR WO-03098643-A1 OR EP-1504457-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/26 04:08 PM
L836	34	(Artificial Intelligence) More like doc: US-3700786-A Text: (GB-8719869-D0 OR DE-2210048-A1 OR GB-1324563-A OR PL-172173-B1 OR EP-0305058-A2 OR JP-H0215510-A OR GB-2209428-A OR DE-4026718-A1 OR US-6717058-B2 OR CN-1725559-A OR US-6566605-B1 OR DE-4026718-C2 OR US-20030196829-A1 OR US-4487992-A OR CA-2071887-A1 OR WO-9209089-A1 OR US-5952615-A OR GB-1361609-A OR US-3775552-A OR JP-S58207812-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/26 04:16 PM
L837	34	(Artificial Intelligence) More like doc: US-2299140-A Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2024/02/26 04:21 PM

L839	36	<p>(DE-4026718-A1 OR IE-912988-A1 OR WO-9203832-A1 OR DE-4026718-C2 OR GB-548221-A OR DE-4026718-C3 OR PT-98763-A OR US-2798899-A OR TN-SN91076-A1 OR US-2427507-A OR US-2881243-A OR JP-S5833617-Y2 OR US-2253138-A OR US-2479919-A OR DE-2550184-A1 OR US-3793476-A OR GB-2286294-A OR US-308890-A OR WO-03098643-A1 OR EP-1504457-A1).did.</p> <p>(Artificial Intelligence) More like doc: US-2166420-A</p> <p>Text: (US-2028793-A OR EP-0554158-A1 OR US-2322903-A OR EP-2323139-A2 OR US-20110117771-A1 OR EP-2323139-B1 OR US-8047866-B2 OR US-2277177-A OR DE-1415609-A1 OR US-2105790-A OR JP-3164785-U OR US-2522169-A OR US-2435284-A OR US-2264439-A OR US-2234579-A OR KR-200463700-Y1 OR KR-20110005075-U OR TW-M379150-U OR EP-2323139-A3 OR US-1751143-A).did.</p>	<p>CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)</p> <p>(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)</p>	OR	ON	ON	2024/02/26 04:24 PM
L841	34	<p>(Artificial Intelligence) More like doc: US-4464583-A</p> <p>Text: (CA-1211152-A OR CN-115473086-A OR EP-4105948-A1 OR US-20220375653-A1 OR EP-3672004-A1 OR EP-3672004-B1 OR EP-0087267-A1 OR AU-2006268241-A1 OR WO-2007008957-A9</p>	<p>(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,</p>	OR	ON	ON	2024/02/26 04:28 PM

L843	31	<p>OR WO-2007008957-A2 OR EP-1902448-A2 OR US-20070097601-A1 OR US-4161012-A OR US-7450363-B2 OR US-3961127-A OR EP-2897241-A1 OR US-20150200529-A1 OR DE-59601877-D1 OR AT-E180114-T1 OR US-7803003-B2).did.</p> <p>(Artificial Intelligence) More like doc: US-10840615-B2</p> <p>Text: (US-20200006869-A1 OR AU-2019293240-B2 OR EP-3815188-A1 OR AU-2019293240-A1 OR WO-2020006238-A1 OR EP-3815188-B1 OR CN-112805880-A OR CN-112805880-B OR US-20200412027-A1 OR US-11121480-B2 OR EP-3866264-A1 OR AU-2021200897-A1 OR US-20210257749-A1 OR US-11431114-B2 OR CN-113270782-A OR US-7686661-B2 OR US-20100029147-A1 OR MX-2021000075-A OR US-7845990-B2 OR US-20100130076-A1).did.</p>	<p>VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)</p> <p>(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)</p>	OR	ON	ON	2024/02/26 05:40 PM
L846	45	<p>(Artificial Intelligence) More like doc: JP-2015198508-A</p> <p>Text: (WO-2017109871-A1 OR JP-2007274841-A OR JP-4664851-B2 OR WO-2017109872-A1 OR JP-2013016640-A OR JP-2012094751-A OR JP-5691891-B2 OR JP-2014107370-A OR JP-3189106-U OR CN-102867870-B OR CN-102867870-A OR JP-H11270085-A OR WO-2015087638-A1 OR CN-113890003-A OR EP-2486640-A2 OR US-20110084556-A1 OR US-20130009662-</p>	<p>(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)</p>	OR	ON	ON	2024/02/26 07:14 PM

L866	39	A1 OR US-20120104872-A1 OR TW-201334355-A OR JP-2013243867-A).did. (Artificial Intelligence) More like doc: US-3852516-A Text: (US-4358634-A OR US-4732628-A OR EP-0641495-B1 OR US-3836702-A OR EP-0641495-A1 OR US-3896260-A OR GB-1558657-A OR EP-0023099-A1 OR EP-0023099-B1 OR US-4262167-A OR CA-1145824-A OR US-2930835-A OR JP-S60194715-A OR US-3209069-A OR GB-2154075-A OR EP-2555335-A1 OR EP-0153799-A1 OR JP-2021034188-A OR AR-009634-A1 OR US-3141060-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/27 05:46 PM
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PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N728	2962	h02s40/30.cpc. h01r9/03.cpc. h01r4/70.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/28 08:55 PM
N729	5	N728 AND (drop ADJ line).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/28 08:56 PM
N730	5	N728 AND (feeder ADJ cable).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/28 08:57 PM

PE2E SEARCH - Search History (Similarity Search)

No Similarity Results available

From: Paul Johnson
To: Cannon, Ryan
Subject: RE: Proposed amendments for 18/523,464 and 18/341,655
Date: Wednesday, February 28, 2024 6:37:48 PM
Attachments: [18341655 \(S4079.10001US04\) Proposed Examiner's Amendment.docx](#)
[18523464 \(S4079.10001US05\) Proposed Examiner's Amendment.docx](#)

CAUTION: This email has originated from a source outside of USPTO. **PLEASE CONSIDER THE SOURCE** before responding, clicking on links, or opening attachments.

Examiner Cannon,

Thanks for the proposals. See attached for my counterproposals. I incorporated all of your changes in underline and then turned on track changes to track my changes. Happy to get on a call to discuss.

Paul G. Johnson
Maschoff Brennan
435-252-1367

From: Cannon, Ryan <Ryan.Cannon@USPTO.GOV>
Sent: Wednesday, February 28, 2024 10:19 AM
To: Paul Johnson <PJohnson@mabr.com>
Subject: Proposed amendments for 18/523,464 and 18/341,655

CAUTION: External Sender

Mr. Johnson,

Please see the attached pdf for my proposals for examiner's amendment to bring the case into condition for allowance. Instant Figures 8 and 54 best represent the limitations I am attempting to capture. I will take suggestions of alternative language that represents those characteristics. This email exchange and the proposed amendments will be placed into the record of each application. Please let me know by the end of this week if you will need more time to get approval or refusal by your client.

Ryan Smith Cannon, Ph. D.
Primary Examiner, AU 1726
(571) 270-7186

FOR DISCUSSION PURPOSES ONLY – DO NOT ENTER IN RECORD

Title: LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Filed: June 26, 2023

Serial No.: 18/341,655

Examiner: Ryan Smith Cannon

First Named Inventor: Dean Solon

Attorney Docket No.: S4079.10001US04

Proposed Examiner's Amendment

1. **(Proposed)** A lead assembly for electrically coupling one or more drop lines to a feeder cable, the lead assembly comprising:

a joint where a section of the feeder cable and a section of the one or more drop lines can be electrically coupled at a nexus, the joint including the section of the feeder cable and the section of the one or more drop lines; and

a monolithic mold that encapsulates the nexus, the monolithic mold further comprising:

a feeder pathway extending completely through the monolithic mold and configured to allow the feeder cable to extend completely through the monolithic mold; and

one or more drop line pathways that each extend at least partially through the monolithic mold, and each configured to allow one of the one or more drop lines to extend at least partially through the monolithic mold;

wherein:

each of the one or more drop lines are configured to be capable of receiving electrical power from a plurality of solar panels for combination at the nexus to the feeder cable;

one of the one or more drop lines includes a section of exposed wire at the nexus;

the feeder cable includes a section of exposed wire at the nexus; and

at least a portion of the section of exposed wire of the drop line is parallel to at least a portion of the section of exposed wire of the feeder cable;

wherein the one or more drop line pathways and the feeder pathway extend parallel to one another away from within the nexus, and the monolithic mold tapers to has distinct apertures/openings at ends of the feeder pathway and one or more drop line pathways through which the one or more drop lines and the feeder cable exit the monolithic mold.

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17. **(Proposed)** A lead assembly comprising:

a joint where a section of a feeder cable and a section of each of two drop lines can be electrically coupled at a nexus, each of the two drop lines connected to a wire harness and configured to receive power from a plurality of solar panels;

a primary mold that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:

a feeder pathway configured to allow the feeder cable to extend completely through the primary mold; and

two drop line pathways that are each configured to allow the two drop lines to extend at least partially through the primary mold, the two drop line pathways including a first drop line pathway and a second drop line pathway;

wherein at least a portion of the first drop line pathway is parallel to at least a portion of the feeder pathway; and

wherein at least a portion of the first drop line pathway and at least a portion of the second drop line pathway extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway.

22. **(Proposed)** A lead assembly comprising:

a feeder cable;

a drop line cable that includes a first drop line and a second drop line, each of the first drop line and the second drop line having an end connected to a wire harness and configured to receive power from a plurality of solar panels;

a joint where a section of the feeder cable and a section of the drop line cable can be electrically coupled at a nexus to electrically couple each of the first drop line and the second drop line to the feeder cable at the nexus;

a mold structure that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the mold structure comprising:

a feeder pathway configured to allow the feeder cable to extend completely through the mold structure; and

a drop line cable pathway configured to allow the drop line cable to extend completely through the mold structure, the drop line cable pathway including a first drop

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line pathway configured to allow the first drop line to extend partially through the mold structure and a second drop line pathway configured to allow the second drop line to extend partially through the mold structure;

wherein at least a portion of the drop line cable pathway is parallel to at least a portion of the feeder pathway; and

wherein at least a portion of the first drop line pathway and at least a portion of the second drop line pathway extend in opposite directions along a longitudinal axis that is parallel to a longitudinal axis of the feeder pathway.

Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	1	Of	4	Attorney Docket Number	S4079.10001US04

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	1.	2003077584	JP		2003-03-14	YUKITA ELECTRIC WIRE CO LTD		
	2.	2005039981	JP		2005-02-10	TOYOKUNI DENSEN KK		
	3.	4044484	JP		2008-02-06	KANEGAFUCHI CHEMICAL IND		
	4.	4080663	JP		2008-04-23	YUKITA ELECTRIC WIRE CO LTD		
	5.	2008166492	JP		2008-07-17	SHOWA SHELL SEKIYU		
	6.	2008187814	JP		2008-08-14	CHUGOKU ELECTRIC POWER		
	7.	4169490	JP		2008-10-22	KUBOTA KK		
	8.	4171359	JP		2008-10-22	TOYOKUNI DENSEN KK		
	9.	4606774	JP		2011-01-05	YAZAKI CORP		
	10.	4730794	JP		2011-07-20	SMK KK		
	11.	2011253739	JP		2011-12-15	NIPPON KOUATSU ELECTRIC CO LTD		
	12.	2012115043	JP		2012-06-14	SUMITOMO WIRING SYSTEMS		
	13.	5384073	JP		2014-01-08	YAZAKI CORP		
	14.	2014229639	JP		2014-12-08	YUNIKON DENSHI KK		
	15.	2015060813	JP		2015-03-30	HOSIDEN CORP		
	16.	2015133822	JP		2015-07-23	AUTO NETWORK		
	17.	200329882	KR		2003-10-11	PARK		
	18.	200446192	KR		2009-10-08	LEE		
	19.	200455299	KR		2011-08-29	LEE		
	20.	10-1428689	KR		2014-08-11	YANG SEUNG ILL		
	21.	2011013979	MX		2012-06-21	COOPER TECHNOLOGIES CO		
	22.	8400078	WO		1984-01-05	RAYCHEM CORP		
	23.	2010124614	WO		2010-11-04	BYD CO LTD		
	24.	2011076955	WO		2011-06-30	PREFABRICADOS UNIBLOK S L U		
	25.	2012166412	WO		2012-06-12	COOPER TECHNOLOGIES CO		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
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				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	2	Of	4	Attorney Docket Number	S4079.10001US04

NON PATENT LITERATURE DOCUMENTS			
Examiner Initial*	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, page(s), volume-issue number(s), publisher, city and/or country where published	T ⁵
	1.	Balance of Systems Product Catalog 2012, Shoals Technologies Group	
	2.	Balance of Systems Product Catalog 2013, Shoals Technologies Group	
	3.	Enphase Engage Cable and Accessories Installation Manual, Enphase Energy, 2011	
	4.	HelioFuse Datasheet, Amphenol	
	5.	Helukabel "Cable systems for photovoltaic installations" and product disclosures, Helukabel, 2011	
	6.	Jurchen Technology - Components for photovoltaic systems, retrieved from http://web.archive.org/web/20120428223249/http://www.jurchen-technology.com/ on 2012	
	7.	Jurchen Technology - Components for photovoltaic systems, retrieved from http://web.archive.org/web/20140208150811/http://www.jurchen-technology.com/ on October 9, 2023	
	8.	Jurchen Technology "DC Cabling Perfectly Connected", 2014	
	9.	Radox® Solar, Huber+Suhner Group, 2011 Ed	
	10.	Shoals Technologies Group In-Line Fuses, 2010	
	11.	Solar Line - Photovoltaic interconnection system, Amphenol industrial solar technologies, https://www.amphenol-industrial.com , November 2012	
	12.	SUNBOLTS Inline Fuse S417 Fuse Cable / Fuse Holder UL 1500V, https://www.bizlinktech.com/products , 2013	
	13.	Sunnector Solar Assemblies & Harnesses, Cooper Interconnect, 2011	
	14.	The World of Lapp – Products for photovoltaic 2012, Lapp Group, 2012	

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				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	3	Of	4	Attorney Docket Number	S4079.10001US04

EXAMINER SIGNATURE			
Examiner Signature	/RYAN S CANNON/	Date Considered	02/27/2024
*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.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
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				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	4	Of	4	Attorney Docket Number	S4079.10001US04

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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2024-01-19
Name/Print	Paul G. Johnson	Registration Number	58539

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.
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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.

Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	1	Of	6	Attorney Docket Number	S4079.10001US04

U.S. PATENTS						
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.	2,700,085		1955-01-18	Breisch et al.	
	2.	2,808,487		1957-10-01	Jacobs	
	3.	3,085,138		1963-04-09	Brown et al.	
	4.	3,086,242		1963-04-23	Cook et al.	
	5.	3,243,211		1966-03-29	Wetmore	
	6.	3,296,399		1967-01-03	Kozacka	
	7.	3,559,141		1971-01-26	Hardy	
	8.	3,678,432		1972-07-18	Boliver	
	9.	3,686,603		1972-08-22	Lockie et al.	
	10.	3,686,604		1972-08-22	Link et al.	
	11.	3,781,745		1973-12-25	Vadnagara	
	12.	3,795,757		1974-03-05	Higgins	
	13.	3,818,407		1974-06-18	Edgerton	
	14.	3,946,351		1976-03-23	Bronikowski et al.	
	15.	4,060,785		1977-11-29	Hanke et al.	
	16.	4,251,304		1981-02-17	Campbell et al.	
	17.	4,308,515		1981-12-29	Rooney et al.	
	18.	4,625,196		1986-11-25	Muench et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	2	Of	6	Attorney Docket Number	S4079.10001US04

U.S. PATENTS						
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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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

U.S. PATENT APPLICATION PUBLICATIONS						
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
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	2.	20050077994		2005-04-14	Martin et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	3	Of	6	Attorney Docket Number	S4079.10001US04

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	1.	2336459	CN		1999-09-01	YANG		
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
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Sheet	4	Of	6	Attorney Docket Number	S4079.10001US04

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	26.	103165235	CN		2013-06-19	SHANGHAI GAOQIAO CABLE FACTORY CO LTD		
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	5	Of	6	Attorney Docket Number	S4079.10001US04

EXAMINER SIGNATURE			
Examiner Signature	/RYAN S CANNON/	Date Considered	02/27/2024
*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.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	6	Of	6	Attorney Docket Number	S4079.10001US04

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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2024-01-19
Name/Print	Paul G. Johnson	Registration Number	58539

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.

Bibliographic Data

Application No: 18/341,655

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:
Examiner's Signature Initials

Title:

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/26/2023	136	1726	S4079.10001US04
RULE			

APPLICANTS

SHOALS TECHNOLOGIES GROUP, LLC, Portland, TN, UNITED STATES

INVENTORS

Dean Solon, Gallatin, TN, UNITED STATES

CONTINUING DATA

This application is a CON of 17301609 04/08/2021 PAT 11689153

17301609 is a CON of 14849458 09/09/2015 PAT 10992254

14849458 has PRO of 62047773 09/09/2014

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/13/2023

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

Maschoff Brennan
1389 Center Drive, Ste. 300
Suite 300
Park City, UT 84098
UNITED STATES

FILING FEE RECEIVED

\$664

Doc Code: ECOMM.AUTH/ECOMM.WTDW

Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

**AUTHORIZATION FOR INTERNET
COMMUNICATIONS IN A PATENT
APPLICATION OR REQUEST TO
WITHDRAW AUTHORIZATION FOR
INTERNET COMMUNICATIONS**

Application No.	18/341,655
Filing Date	June 26, 2023
First Named Inventor	Dean Solon
Art Unit	1726
Examiner Name	Ryan Smith Cannon
Practitioner Docket No.	S4079.10001US04

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. To authorize permission for Internet Communications.

☒ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 58539.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Paul G. Johnson/
Signature

February 27, 2024
Date

Paul G. Johnson
Typed or printed name

(435) 252-1360
Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☒ * Total of one forms are submitted.

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.
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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Dean Solon	Art Unit 1726
Application No.:	18/341,655	
Filed:	June 26, 2023	
Conf. No.:	4873	
For:	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER	
Examiner:	Ryan Smith Cannon	
Customer No.:	97149	
Attorney Docket No.:	S4079.10001US04	

SUPPLEMENTAL RESPONSE TO OFFICE ACTION DATED JANUARY 12, 2024

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

Dear Commissioner:

Please consider the following reply, which supersedes the response filed on February 14, 2024 in response to the Non-Final Office Action dated January 12, 2024.

AMENDMENTS TO THE CLAIMS 2
REMARKS 7

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

1. **(Currently Amended)** A lead assembly for electrically coupling one or more drop lines to a feeder cable, the lead assembly comprising:

a joint where a section of the feeder cable and a section of the ~~at least~~ one or more drop lines can be electrically coupled at a nexus, the joint including the section of the feeder cable and the section of the one or more drop lines; and

a monolithic mold that encapsulates the nexus, the monolithic mold further comprising:

a feeder pathway extending completely through the monolithic mold and configured to allow the feeder cable to extend completely through the monolithic mold; and

one or more drop line pathways that each extend at least partially through the monolithic mold, and each configured to allow one of the one or more drop lines to extend at least partially through the monolithic mold; wherein:

each of the one or more drop lines are configured to be capable of receiving electrical power from a plurality of solar panels for combination at the nexus to the feeder cable;

one of the one or more drop lines includes a section of exposed wire at the nexus;

the feeder cable includes a section of exposed wire at the nexus; and

at least a portion of the section of exposed wire of the drop line is parallel to at least a portion of the section of exposed wire of the feeder cable.

- 2-3. **(Cancelled)**

4. **(Original)** The lead assembly of claim 1, wherein the nexus includes at least one of a compression lug, a solder portion, a splice, and a crimp.

5. **(Original)** The lead assembly of claim 1, wherein the feeder cable is configured to attach directly to an inverter.

6. **(Original)** The lead assembly of claim 1, wherein the feeder pathway is formed along a first longitudinal axis and the one or more drop line pathways are each formed along a longitudinal axis different from the first longitudinal axis.
7. **(Original)** The lead assembly of claim 1, wherein the feeder pathway has a first diameter, and the one or more drop line pathways have a second diameter, wherein the second diameter is smaller than the first diameter.
8. **(Original)** The lead assembly of claim 1, comprising two or more drop line pathways.
9. **(Original)** The lead assembly of claim 1, wherein each of the one or more drop lines is configured to terminate at a drop line connector.
10. **(Original)** The lead assembly of claim 9, wherein each of the one or more drop line connectors is configured to connect to a wire harness that is configured to connect to a plurality of solar panels.
11. **(Original)** The lead assembly of claim 1, wherein the combined electrical power received from the plurality of solar panels is conducted directly to an inverter electrically connected to the feeder cable.
12. **(Original)** The lead assembly of claim 1, wherein the lead assembly is configured to combine electrical power received from the plurality of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder cable.
13. **(Original)** The lead assembly of claim 1, wherein the one or more drop lines each includes a wire of between four (4) to eighteen (18) gauge.
14. **(Original)** The lead assembly of claim 1, wherein the feeder cable includes a wire of between 250 MCM to 1000 MCM.

15. **(Previously Presented)** The lead assembly of claim 1, wherein the monolithic mold is injection molded.

16. **(Currently Amended)** The lead assembly of claim 1, wherein:
the monolithic mold comprises an undermold;
the lead assembly further comprises an overmold that encapsulates the undermold;
the overmold is injection molded.

17. **(Currently Amended)** A lead assembly comprising:
a joint where a section of a feeder cable and a section of each of two drop lines can be electrically coupled at a nexus, each of the two drop lines connected to a wire harness and configured to receive power from a plurality of solar panels;
a primary mold that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:
a feeder pathway configured to allow the feeder cable to extend completely through the primary mold; and
two drop line pathways that are each configured to allow the two drop lines to extend at least partially through the primary mold, the two drop line pathways including a first drop line pathway and a second drop line pathway;
wherein at least a portion of the first drop line pathway is parallel to at least a portion of the feeder pathway.

18. **(Original)** The lead assembly of claim 17, wherein the feeder cable is directly electrically connected to a component selected from the group consisting of a trunk buss jumper, an inverter, a connection unit, a recombiner, and a disconnect unit.

19. **(Original)** The lead assembly of claim 17, further comprising a secondary mold encapsulating the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold.

20. **(Original)** The lead assembly of claim 17, wherein electrical power received from the plurality of solar panels is combined at the nexus and conducted directly to an inverter electrically connected to the feeder cable.

21. **(Previously Presented)** The lead assembly of claim 17, wherein the lead assembly has a voltage rating of at least 1000 VDC.

22. **(New)** A lead assembly comprising:

a feeder cable;

a drop line cable that includes a first drop line and a second drop line, each of the first drop line and the second drop line having an end connected to a wire harness and configured to receive power from a plurality of solar panels;

a joint where a section of the feeder cable and a section of the drop line cable can be electrically coupled at a nexus to electrically couple each of the first drop line and the second drop line to the feeder cable at the nexus;

a mold structure that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the mold structure comprising:

a feeder pathway configured to allow the feeder cable to extend completely through the mold structure; and

a drop line cable pathway configured to allow the drop line cable to extend completely through the mold structure, the drop line cable pathway including a first drop line pathway configured to allow the first drop line to extend partially through the mold structure and a second drop line pathway configured to allow the second drop line to extend partially through the mold structure;

wherein at least a portion of the drop line cable pathway is parallel to at least a portion of the feeder pathway.

23. **(New)** The lead assembly of claim 22, wherein the first drop line extends out of and away from the mold structure in one direction and the second drop line extends out of and away from the mold structure in an opposite direction.

24. **(New)** The lead assembly of claim 22, wherein:
 the drop line cable includes a section of exposed wire at the nexus;
 a first portion of the section of exposed wire of the drop line cable is a part of the first drop line;
 a second portion of the section of exposed wire of the drop line cable is a part of the second drop line;
 the feeder cable includes a section of exposed wire at the nexus; and
 the section of exposed wire of the drop line cable is electrically coupled to the section of exposed wire of the feeder cable to electrically couple the first drop line and the second drop line to the feeder cable.
25. **(New)** The lead assembly of claim 24, wherein at least a portion of the section of exposed wire of the drop line cable is parallel to at least a portion of the section of exposed wire of the feeder cable.
26. **(New)** The lead assembly of claim 22, wherein the mold structure further comprises a monolithic mold structure.

REMARKS

The foregoing amendment cancels claims 2-3 without prejudice; amends claims 1, 16, and 17; and adds new claims 22-26. Claims 1 and 4-26 are now pending.

Applicant respectfully requests reconsideration of the application in view of the above amendments to the claims and the following remarks. Unless otherwise stated herein, amendments to the claims have been made at the discretion of the Applicant and not necessarily for reasons related to patentability.

Applicant reserves the right to pursue any previously pending claims or other claims that capture any subject matter supported by the present disclosure. Additionally, Applicant reserves the right, both during and after prosecution of this case, to modify or revoke the views expressed with regard to any cited reference.

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The following remarks are not intended to exhaustively identify all distinctions between any cited reference and the claims. The term “Applicant” is used generically herein to refer to any entity with authority to prosecute this application.

Rejections Under 35 U.S.C. § 102

The Office Action rejects claims 1-3, 5-7, 9-12, and 15 under 35 U.S.C. § 102 over Fujimoto et al. (JP Publication No. 2014/050227).

The Office Action rejects claims 1-3, 6, and 15-16 under 35 U.S.C. § 102 over Harrison et al. (WO Publication No. 01/09990).

Rejections based on *Fujimoto*

Applicant disagrees with aspects of the rejection. Nevertheless, in the interest of expediting prosecution, Applicant has amended independent claim 1 to incorporate the subject matter of

claims 2 and 3 as well as additional subject matter. In particular, claim 1 is herein amended to recite, for example:

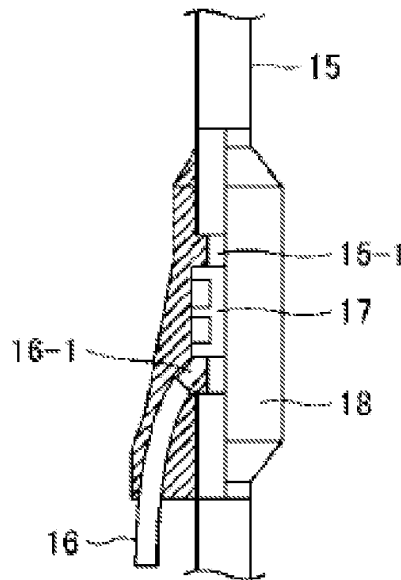
wherein:
...
one of the one or more drop lines includes a section of exposed wire at the
nexus;
the feeder cable includes a section of exposed wire at the nexus; and
at least a portion of the section of exposed wire of the drop line is parallel
to the section of exposed wire of the feeder cable.

Support for the foregoing amendment to claim 1 is provided in at least original claims 2 and 3 and in FIGS. 7 and 37 and the accompanying description of the specification.

In the rejection of claims 1-3 based on *Fujimoto*, the Office Action alleges the following correspondence between various elements recited in claims 1-3 and the teachings of *Fujimoto*:

Claim element	<i>Fujimoto's</i> teachings
“feeder cable”	trunk cable 15
“one or more drop lines”	branch line cable 16
“a section of exposed wire [of the drop line] at the nexus”	core line 16-1 of the branch line cable 16
“a section of exposed wire [of the feeder cable] at the nexus”	core line 15-1 of the trunk cable 15

FIG. 3 of *Fujimoto* is reproduced below for reference to show the arrangement of *Fujimoto's* trunk cable 15, branch line cable 16, core line 16-1 of the branch line cable 16, and core line of the trunk cable 15 at the alleged nexus:



It can be seen from FIG. 3 of *Fujimoto* above that the core line 16-1 of the branch line cable 16 is NOT parallel to the core line 15-1 of the trunk cable 15. As such, *Fujimoto* fails to disclose “**at least a portion of the section of exposed wire of the drop line is parallel to the section of exposed wire of the feeder cable**” as now recited in amended claim 1.

Accordingly, the claim amendments and remarks herein, taken as a whole, appear to render the rejections moot. Applicant notes that portions of the claims, other than those specifically amended and/or mentioned above, may contribute to patentability. In light of the references as now understood by Applicant and the amendments made herein, claim 1 appears to be allowable. Applicant therefore respectfully requests that the anticipation rejections of claims 1-3, 5-7, 9-12, and 15 based on *Fujimoto* be withdrawn.

Rejections based on *Harrison*

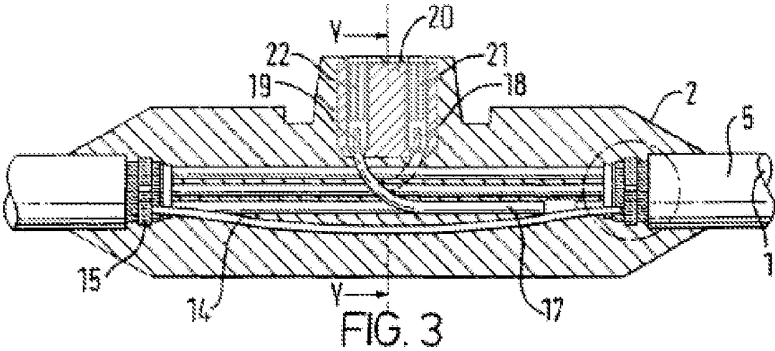
Applicant disagrees with aspects of the rejection. Nevertheless, in the interest of expediting prosecution, Applicant has amended independent claim 1 to recite, for example, “a joint where a section of the feeder cable and a section of the one or more drop lines can be electrically coupled at a nexus, the joint including the section of the feeder cable and the section of the one or more drop lines” and “a monolithic mold that encapsulates the nexus”. Support for the foregoing

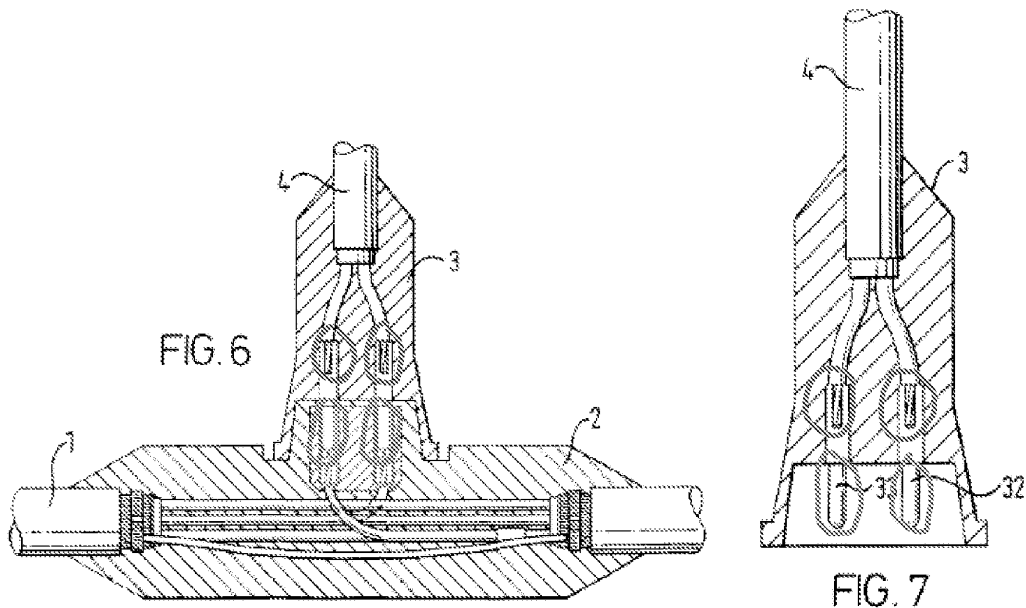
amendment to claim 1 is provided in at least FIG. 7 and the accompanying description of the specification.

In the rejection of claim 1 based on *Harrison*, the Office Action alleges the following correspondence between various elements recited in claim 1 and the teachings of *Harrison*:

Claim element	<i>Harrison's</i> teachings
“joint”	ceramic insert 20
“feeder cable”	conducting cores 17
“one or more drop lines”	cores extending from second cable 4 in FIG. 7
“a section of the at least one or more drop lines”	pin fittings 33, 32 in FIG. 7
“mold”	connector fitting 2 and breakout plug 3
“feeder pathway”	a pathway within connector fitting 2
“one or more drop line pathways”	a pathway within breakout plug 3

FIGS. 3, 6, and 7 of *Harrison* are reproduced below for reference to show the arrangement of *Harrison's* ceramic insert 20, conducting cores 17, cores extending from second cable 4, pin fittings 33, 32, brass socket insert 22, connector fitting 2, and breakout plug 3:





As seen and highlighted in yellow in FIGS. 3 and 6, *Harrison's* ceramic insert 20 (equated to the “joint”) is confined within *Harrison's* connector fitting 2. As seen and outlined in red in FIGS. 6 and 7, *Harrison's* cores that extend from second cable 4 (equated to the “one or more drop lines”) are entirely confined within *Harrison's* breakout plug 3 and do NOT extend into *Harrison's* ceramic insert 20 in the connected configuration of FIG. 6. As further seen and outlined in green in FIGS. 6 and 7, *Harrison's* pin fittings 33, 32 (equated to the “section of the at least one or more drop lines”), while electrically coupled to the cores extending from the second cable 4 (equated to the “one or more drop lines”), are not equivalent to the cores extending from the second cable 4. Because *Harrison's* cores (circled in red above) are not equivalent to *Harrison's* pin fittings 33, 32 (circled in green above) and fail to extend into *Harrison's* ceramic insert 20 (highlighted in yellow above, *Harrison* fails to disclose “**the joint including the section of the feeder cable and the section of the one or more drop lines**” as now recited in amended claim 1.

In addition, amended claim 1 recites “a monolithic mold that encapsulates the nexus, the monolithic mold comprising: a feeder pathway . . . ; and one or more drop line pathways”. Because *Harrison's* allegedly equivalent pathways in the connector fitting 2 and breakout plug 3 are in two separable components, i.e., the alleged feeder pathway being in *Harrison's* connector fitting 2 and the alleged one or more drop line pathways being in *Harrison's* breakout plug 3, ***Harrison fails to***

disclose a “monolithic mold” as recited in amended claim 1. Moreover, one of ordinary skill in the art at the time of the invention would not have been motivated to modify *Harrison* to include a monolithic mold in place of *Harrison*'s connector fitting 2 and breakout plug 3 since *Harrison*'s disclosure relates to “electrical cable systems . . . for example sockets and plugs”.

Accordingly, the claim amendments and remarks herein, taken as a whole, appear to render the rejections moot. Applicant notes that portions of the claims, other than those specifically amended and/or mentioned above, may contribute to patentability. In light of the references as now understood by Applicant and the amendments made herein, claim 1 appears to be allowable. Applicant therefore respectfully requests that the anticipation rejections of claims 1-3, 6, and 15-16 based on *Harrison* be withdrawn.

Rejections under 35 U.S.C. § 103

The Office Action rejects claim 4 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Jonczyk et al. (U.S. Publication No. 2010/0139733).

The Office Action rejects claims 8 and 13 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Solon et al. (U.S. Publication No. 2011/0011642).

The Office Action rejects claim 14 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Ramsey (U.S. Publication No. 2013/0269746), supporting information is provided by Kummer et al. (U.S. Publication No. 2009/0300909) and Hernandez et al. (U.S. Publication No. 2011/0174521).

The Office Action rejects claims 17-18 and 20 under 35 U.S.C. § 103 Fujimoto in view of Solon.

The Office Action rejects claim 19 under 35 U.S.C. § 103 over Fujimoto in view of Solon as applied to claim 17 above and further in view of Ookuma et al. (U.S. Patent No. 5,316,789).

The Office Action rejects claim 21 under 35 U.S.C. § 103 over Fujimoto in view of Solon as applied to claim 17 above and further in view of Solon (U.S. Publication No. 2011/0209741).

Claims 4, 8, 13, and 14 depend on claim 1 discussed above. Thus, in light of the remarks presented above, the Office Action does not present a *prima facie* case that these claims are not

patentable. Applicant therefore respectfully requests that the rejections of claims 4, 8, 13, and 14 be withdrawn.

Claim 17 is herein amended to recite one or more elements similar to that discussed above and claims 18-21 depend from claim 17. Therefore, for at least the reasons presented above, the Office Action does not present a *prima facie* case that claims 17-21 are not patentable. Applicant therefore respectfully requests that the rejections of claims 17-21 be withdrawn.

New claims 22-26

Support for new claims 22-26 is provided throughout the original specification, including at least in Figs. 29 and 31-37 and their associated description.

Independent claim 22 recites one or more elements similar to that discussed above and claims 23-26 depend from claim 22. Therefore, for at least the reasons presented above, new claims 22-26 appear to be allowable over the cited references.

Charge Authorization

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 50-5394: (1) any filing fees required under 37 C.F.R. § 1.16; (2) any patent application and reexamination processing fees under 37 C.F.R. § 1.17; and/or (3) any post issuance fees under 37 C.F.R. § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 50-5394.

CONCLUSION

In view of the foregoing, Applicant submits that the pending claims are allowable. In the event that Examiner finds remaining impediment to allowance of this application that may be clarified through a telephone interview or overcome by an Examiner's Amendment, Examiner is invited to contact the undersigned attorney.

Dated this 22nd day of February, 2024.

Respectfully submitted,

/Paul G. Johnson/

Paul G. Johnson
Registration No. 58,539
Attorney for Applicant
Telephone No. (435) 252-1360



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION # 18/341,655	RECEIPT DATE / TIME 02/14/2024 06:13:22 PM Z ET	ATTORNEY DOCKET # S4079.10001US04
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Title of Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	4873	FILED BY	JOLIN JOHNSON
PATENT CENTER #	64326105	FILING DATE	06/26/2023
CUSTOMER #	97149	FIRST NAMED INVENTOR	Dean Solon
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Paul Johnson

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
S4079.10001US04_2024-02-14_NFOAR.pdf	12	-	341 KB
S4079.10001US04_2024-02-14_NFOAR-A....pdf (1-1)	1	Amendment/Request for Reconsideration-After Non-Final Rejection	108 KB
S4079.10001US04_2024-02-14_NFOAR-CLM.pdf (2-5)	4	Claims	117 KB
S4079.10001US04_2024-02-14_NFOAR-REM.pdf (6-12)	7	Applicant Arguments/Remarks Made in an Amendment	284 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
S4079.10001US04_2024-02-14_NFOAR.pdf	F69C2E9453F0951298A5E1D886084A070A4F73B1EBAE6742D D78947184A483C5E8DEDC48978F68FB8FF541EC99D2CE2F6 D7EC4CEFDA3EB2993CA7DE2653176AA
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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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Dean Solon	Art Unit 1726
Application No.:	18/341,655	
Filed:	June 26, 2023	
Conf. No.:	4873	
For:	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER	
Examiner:	Ryan Smith Cannon	
Customer No.:	97149	
Attorney Docket No.:	S4079.10001US04	

RESPONSE TO OFFICE ACTION DATED JANUARY 12, 2024

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

Dear Commissioner:

In response to the Non-Final Office Action dated January 12, 2024, please consider:

AMENDMENTS TO THE CLAIMS 2
REMARKS 6

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

1. **(Currently Amended)** A lead assembly for electrically coupling one or more drop lines to a feeder cable, the lead assembly comprising:

a joint where a section of the feeder cable and a section of the ~~at least~~ one or more drop lines can be electrically coupled at a nexus, the joint including the section of the feeder cable and the section of the one or more drop lines; and

a monolithic mold that encapsulates the nexus, the monolithic mold further comprising:

a feeder pathway extending completely through the monolithic mold and configured to allow the feeder cable to extend completely through the monolithic mold; and

one or more drop line pathways that each extend partially through the monolithic mold, and each configured to allow one of the one or more drop lines to extend partially through the monolithic mold;

wherein:

each of the one or more drop lines are configured to be capable of receiving electrical power from a plurality of solar panels for combination at the nexus to the feeder cable;

one of the one or more drop lines includes a section of exposed wire at the nexus;

the feeder cable includes a section of exposed wire at the nexus; and

at least a portion of the section of exposed wire of the drop line is parallel to the section of exposed wire of the feeder cable.

- 2-3. **(Cancelled)**

4. **(Original)** The lead assembly of claim 1, wherein the nexus includes at least one of a compression lug, a solder portion, a splice, and a crimp.

5. **(Original)** The lead assembly of claim 1, wherein the feeder cable is configured to attach directly to an inverter.

6. **(Original)** The lead assembly of claim 1, wherein the feeder pathway is formed along a first longitudinal axis and the one or more drop line pathways are each formed along a longitudinal axis different from the first longitudinal axis.
7. **(Original)** The lead assembly of claim 1, wherein the feeder pathway has a first diameter, and the one or more drop line pathways have a second diameter, wherein the second diameter is smaller than the first diameter.
8. **(Original)** The lead assembly of claim 1, comprising two or more drop line pathways.
9. **(Original)** The lead assembly of claim 1, wherein each of the one or more drop lines is configured to terminate at a drop line connector.
10. **(Original)** The lead assembly of claim 9, wherein each of the one or more drop line connectors is configured to connect to a wire harness that is configured to connect to a plurality of solar panels.
11. **(Original)** The lead assembly of claim 1, wherein the combined electrical power received from the plurality of solar panels is conducted directly to an inverter electrically connected to the feeder cable.
12. **(Original)** The lead assembly of claim 1, wherein the lead assembly is configured to combine electrical power received from the plurality of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder cable.
13. **(Original)** The lead assembly of claim 1, wherein the one or more drop lines each includes a wire of between four (4) to eighteen (18) gauge.
14. **(Original)** The lead assembly of claim 1, wherein the feeder cable includes a wire of between 250 MCM to 1000 MCM.

15. **(Previously Presented)** The lead assembly of claim 1, wherein the monolithic mold is injection molded.

16. **(Previously Presented)** The lead assembly of claim 1, wherein:
the monolithic mold comprises an undermold;
the lead assembly further comprises an overmold that encapsulates the undermold;
the overmold is injection molded.

17. **(Currently Amended)** A lead assembly comprising:
a joint where a section of a feeder cable and a section of each of two drop lines can be electrically coupled at a nexus, each of the two drop lines connected to a wire harness and configured to receive power from a plurality of solar panels;
a primary mold that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:
a feeder pathway configured to allow the feeder cable to extend completely through the primary mold; and
two drop line pathways that are each configured to allow the two drop lines to extend partially through the primary mold, the two drop line pathways including a first drop line pathway and a second drop line pathway;
wherein at least a portion of a longitudinal axis of the first drop line pathway is parallel to at least a portion of a longitudinal axis of the feeder pathway.

18. **(Original)** The lead assembly of claim 17, wherein the feeder cable is directly electrically connected to a component selected from the group consisting of a trunk buss jumper, an inverter, a connection unit, a recombiner, and a disconnect unit.

19. **(Original)** The lead assembly of claim 17, further comprising a secondary mold encapsulating the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold.

20. **(Original)** The lead assembly of claim 17, wherein electrical power received from the plurality of solar panels is combined at the nexus and conducted directly to an inverter electrically connected to the feeder cable.

21. **(Previously Presented)** The lead assembly of claim 17, wherein the lead assembly has a voltage rating of at least 1000 VDC.

REMARKS

The foregoing amendment cancels claims 2-3 without prejudice and amends claims 1 and 17. Claims 1 and 4-21 are now pending.

Applicant respectfully requests reconsideration of the application in view of the above amendments to the claims and the following remarks. Unless otherwise stated herein, amendments to the claims have been made at the discretion of the Applicant and not necessarily for reasons related to patentability.

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Applicant disagrees with aspects of the rejection. Nevertheless, in the interest of expediting prosecution, Applicant has amended independent claim 1 to incorporate the subject matter of claims 2 and 3 as well as additional subject matter. In particular, claim 1 is herein amended to recite, for example:

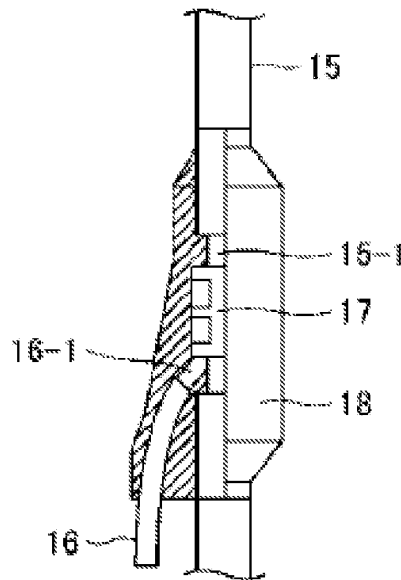
wherein:
...
one of the one or more drop lines includes a section of exposed wire at the
nexus;
the feeder cable includes a section of exposed wire at the nexus; and
at least a portion of the section of exposed wire of the drop line is parallel
to the section of exposed wire of the feeder cable.

Support for the foregoing amendment to claim 1 is provided in at least original claims 2 and 3 and in FIGS. 7 and 37 and the accompanying description of the specification.

In the rejection of claims 1-3 based on *Fujimoto*, the Office Action alleges the following correspondence between various elements recited in claims 1-3 and the teachings of *Fujimoto*:

Claim element	<i>Fujimoto</i> 's teachings
"feeder cable"	trunk cable 15
"one or more drop lines"	branch line cable 16
"a section of exposed wire [of the drop line] at the nexus"	core line 16-1 of the branch line cable 16
"a section of exposed wire [of the feeder cable] at the nexus"	core line 15-1 of the trunk cable 15

FIG. 3 of *Fujimoto* is reproduced below for reference to show the arrangement of *Fujimoto*'s trunk cable 15, branch line cable 16, core line 16-1 of the branch line cable 16, and core line of the trunk cable 15 at the alleged nexus:



It can be seen from FIG. 3 of *Fujimoto* above that the core line 16-1 of the branch line cable 16 is NOT parallel to the core line 15-1 of the trunk cable 15. As such, *Fujimoto* fails to disclose “**at least a portion of the section of exposed wire of the drop line is parallel to the section of exposed wire of the feeder cable**” as now recited in amended claim 1.

Accordingly, the claim amendments and remarks herein, taken as a whole, appear to render the rejections moot. Applicant notes that portions of the claims, other than those specifically amended and/or mentioned above, may contribute to patentability. In light of the references as now understood by Applicant and the amendments made herein, claim 1 appears to be allowable. Applicant therefore respectfully requests that the anticipation rejections of claims 1-3, 5-7, 9-12, and 15 based on *Fujimoto* be withdrawn.

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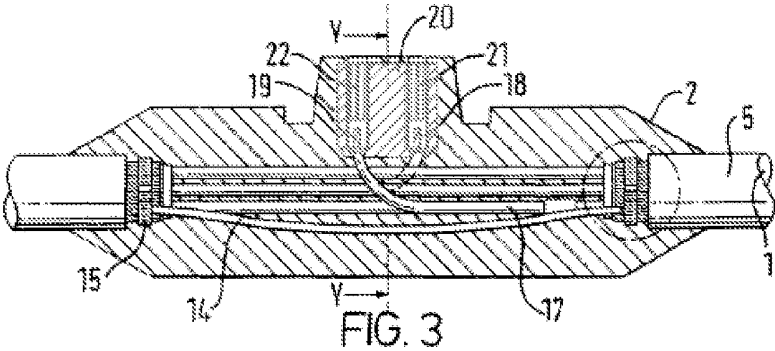
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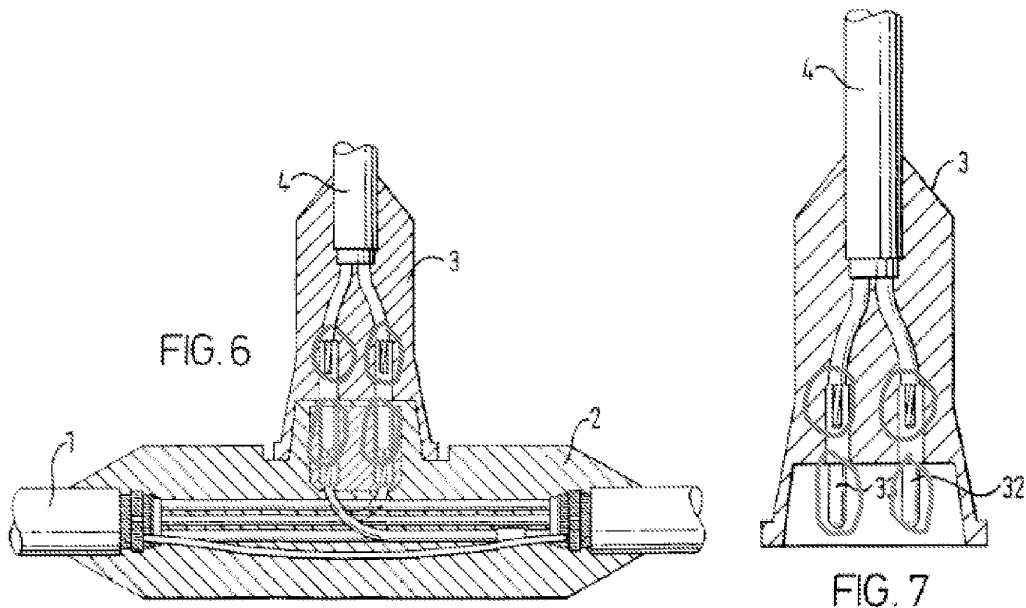
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In the rejection of claim 1 based on *Harrison*, the Office Action alleges the following correspondence between various elements recited in claim 1 and the teachings of *Harrison*:

Claim element	<i>Harrison's</i> teachings
“joint”	ceramic insert 20
“feeder cable”	conducting cores 17
“one or more drop lines”	cores extending from second cable 4 in FIG. 7
“a section of the at least one or more drop lines”	pin fittings 33, 32 in FIG. 7
“mold”	connector fitting 2 and breakout plug 3
“feeder pathway”	a pathway within connector fitting 2
“one or more drop line pathways”	a pathway within breakout plug 3

FIGS. 3, 6, and 7 of *Harrison* are reproduced below for reference to show the arrangement of *Harrison's* ceramic insert 20, conducting cores 17, cores extending from second cable 4, pin fittings 33, 32, brass socket insert 22, connector fitting 2, and breakout plug 3:





As seen and highlighted in yellow in FIGS. 3 and 6, *Harrison's* ceramic insert 20 (equated to the “joint”) is confined within *Harrison's* connector fitting 2. As seen and outlined in red in FIGS. 6 and 7, *Harrison's* cores that extend from second cable 4 (equated to the “one or more drop lines”) are entirely confined within *Harrison's* breakout plug 3 and do NOT extend into *Harrison's* ceramic insert 20 in the connected configuration of FIG. 6. As further seen and outlined in green in FIGS. 6 and 7, *Harrison's* pin fittings 33, 32 (equated to the “section of the at least one or more drop lines”), while electrically coupled to the cores extending from the second cable 4 (equated to the “one or more drop lines”), are not equivalent to the cores extending from the second cable 4. Because *Harrison's* cores (circled in red above) are not equivalent to *Harrison's* pin fittings 33, 32 (circled in green above) and fail to extend into *Harrison's* ceramic insert 20 (highlighted in yellow above, *Harrison* fails to disclose “**the joint including the section of the feeder cable and the section of the one or more drop lines**” as now recited in amended claim 1.

In addition, amended claim 1 recites “a monolithic mold that encapsulates the nexus, the monolithic mold comprising: a feeder pathway . . . ; and one or more drop line pathways”. Because *Harrison's* allegedly equivalent pathways in the connector fitting 2 and breakout plug 3 are in two separable components, i.e., the alleged feeder pathway being in *Harrison's* connector fitting 2 and the alleged one or more drop line pathways being in *Harrison's* breakout plug 3, ***Harrison fails to***

disclose a “monolithic mold” as recited in amended claim 1. Moreover, one of ordinary skill in the art at the time of the invention would not have been motivated to modify *Harrison* to include a monolithic mold in place of *Harrison*’s connector fitting 2 and breakout plug 3 since *Harrison*’s disclosure relates to “electrical cable systems . . . for example sockets and plugs”.

Accordingly, the claim amendments and remarks herein, taken as a whole, appear to render the rejections moot. Applicant notes that portions of the claims, other than those specifically amended and/or mentioned above, may contribute to patentability. In light of the references as now understood by Applicant and the amendments made herein, claim 1 appears to be allowable. Applicant therefore respectfully requests that the anticipation rejections of claims 1-3, 6, and 15-16 based on *Harrison* be withdrawn.

Rejections under 35 U.S.C. § 103

The Office Action rejects claim 4 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Jonczyk et al. (U.S. Publication No. 2010/0139733).

The Office Action rejects claims 8 and 13 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Solon et al. (U.S. Publication No. 2011/0011642).

The Office Action rejects claim 14 under 35 U.S.C. § 103 over Fujimoto as applied to claim 1 above in view of Ramsey (U.S. Publication No. 2013/0269746), supporting information is provided by Kummer et al. (U.S. Publication No. 2009/0300909) and Hernandez et al. (U.S. Publication No. 2011/0174521).

The Office Action rejects claims 17-18 and 20 under 35 U.S.C. § 103 Fujimoto in view of Solon.

The Office Action rejects claim 19 under 35 U.S.C. § 103 over Fujimoto in view of Solon as applied to claim 17 above and further in view of Ookuma et al. (U.S. Patent No. 5,316,789).

The Office Action rejects claim 21 under 35 U.S.C. § 103 over Fujimoto in view of Solon as applied to claim 17 above and further in view of Solon (U.S. Publication No. 2011/0209741).

Claims 4, 8, 13, and 14 depend on claim 1 discussed above. Thus, in light of the remarks presented above, the Office Action does not present a *prima facie* case that these claims are not patentable. Applicant therefore respectfully requests that the rejections of claims 4, 8, 13, and 14 be withdrawn.

Claim 17 is herein amended to recite one or more elements similar to that discussed above and claims 18-21 depend from claim 17. Therefore, for at least the reasons presented above, the Office Action does not present a *prima facie* case that claims 17-21 are not patentable. Applicant therefore respectfully requests that the rejections of claims 17-21 be withdrawn.

Charge Authorization

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 50-5394: (1) any filing fees required under 37 C.F.R. § 1.16; (2) any patent application and reexamination processing fees under 37 C.F.R. § 1.17; and/or (3) any post issuance fees under 37 C.F.R. § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 50-5394.

CONCLUSION

In view of the foregoing, Applicant submits that the pending claims are allowable. In the event that Examiner finds remaining impediment to allowance of this application that may be clarified through a telephone interview or overcome by an Examiner's Amendment, Examiner is invited to contact the undersigned attorney.

Dated this 14th day of February, 2024.

Respectfully submitted,

/Paul G. Johnson/

Paul G. Johnson
Registration No. 58,539
Attorney for Applicant
Telephone No. (435) 252-1360

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 18/341,655		Filing Date 06/26/2023		☐ 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), (l), 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(j))	minus 20 =	*			x \$40 =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*			x \$192 =				
☐ 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	02/14/2024	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(j))	* 19	Minus ** 21	= 0		x \$40 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus *** 3	= 0		x \$192 =		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	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(j))	*	Minus **	=		x \$0 =			
	Independent (37 CFR 1.16(h))	*	Minus ***	=		x \$0 =			
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE			
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/FREDERICK E BRISCOE/			
*** 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 number found in the appropriate box in column 1.									

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	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	1	Of	4	Attorney Docket Number	S4079.10001US04

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	1.	2003077584	JP		2003-03-14	YUKITA ELECTRIC WIRE CO LTD		
	2.	2005039981	JP		2005-02-10	TOYOKUNI DENSEN KK		
	3.	4044484	JP		2008-02-06	KANEGAFUCHI CHEMICAL IND		
	4.	4080663	JP		2008-04-23	YUKITA ELECTRIC WIRE CO LTD		
	5.	2008166492	JP		2008-07-17	SHOWA SHELL SEKIYU		
	6.	2008187814	JP		2008-08-14	CHUGOKU ELECTRIC POWER		
	7.	4169490	JP		2008-10-22	KUBOTA KK		
	8.	4171359	JP		2008-10-22	TOYOKUNI DENSEN KK		
	9.	4606774	JP		2011-01-05	YAZAKI CORP		
	10.	4730794	JP		2011-07-20	SMK KK		
	11.	2011253739	JP		2011-12-15	NIPPON KOUATSU ELECTRIC CO LTD		
	12.	2012115043	JP		2012-06-14	SUMITOMO WIRING SYSTEMS		
	13.	5384073	JP		2014-01-08	YAZAKI CORP		
	14.	2014229639	JP		2014-12-08	YUNIKON DENSHI KK		
	15.	2015060813	JP		2015-03-30	HOSIDEN CORP		
	16.	2015133822	JP		2015-07-23	AUTO NETWORK		
	17.	200329882	KR		2003-10-11	PARK		
	18.	200446192	KR		2009-10-08	LEE		
	19.	200455299	KR		2011-08-29	LEE		
	20.	10-1428689	KR		2014-08-11	YANG SEUNG ILL		
	21.	2011013979	MX		2012-06-21	COOPER TECHNOLOGIES CO		
	22.	8400078	WO		1984-01-05	RAYCHEM CORP		
	23.	2010124614	WO		2010-11-04	BYD CO LTD		
	24.	2011076955	WO		2011-06-30	PREFABRICADOS UNIBLOK S L U		
	25.	2012166412	WO		2012-06-12	COOPER TECHNOLOGIES CO		

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NON PATENT LITERATURE DOCUMENTS			
Examiner Initial*	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, page(s), volume-issue number(s), publisher, city and/or country where published	T ⁵
	1.	Balance of Systems Product Catalog 2012, Shoals Technologies Group	
	2.	Balance of Systems Product Catalog 2013, Shoals Technologies Group	
	3.	Enphase Engage Cable and Accessories Installation Manual, Enphase Energy, 2011	
	4.	HelioFuse Datasheet, Amphenol	
	5.	Helukabel "Cable systems for photovoltaic installations" and product disclosures, Helukabel, 2011	
	6.	Jurchen Technology - Components for photovoltaic systems, retrieved from http://web.archive.org/web/20120428223249/http://www.jurchen-technology.com/ on 2012	
	7.	Jurchen Technology - Components for photovoltaic systems, retrieved from http://web.archive.org/web/20140208150811/http://www.jurchen-technology.com/ on October 9, 2023	
	8.	Jurchen Technology "DC Cabling Perfectly Connected", 2014	
	9.	Radox® Solar, Huber+Suhner Group, 2011 Ed	
	10.	Shoals Technologies Group In-Line Fuses, 2010	
	11.	Solar Line - Photovoltaic interconnection system, Amphenol industrial solar technologies, https://www.amphenol-industrial.com , November 2012	
	12.	SUNBOLTS Inline Fuse S417 Fuse Cable / Fuse Holder UL 1500V, https://www.bizlinktech.com/products , 2013	
	13.	Sunnector Solar Assemblies & Harnesses, Cooper Interconnect, 2011	
	14.	The World of Lapp – Products for photovoltaic 2012, Lapp Group, 2012	

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EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
<small>*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>			
<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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				Examiner Name	Ryan Smith Cannon
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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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2024-01-19
Name/Print	Paul G. Johnson	Registration Number	58539
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.
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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.

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Sheet	1	Of	6	Attorney Docket Number	S4079.10001US04

U.S. PATENTS						
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.	2,700,085		1955-01-18	Breisch et al.	
	2.	2,808,487		1957-10-01	Jacobs	
	3.	3,085,138		1963-04-09	Brown et al.	
	4.	3,086,242		1963-04-23	Cook et al.	
	5.	3,243,211		1966-03-29	Wetmore	
	6.	3,296,399		1967-01-03	Kozacka	
	7.	3,559,141		1971-01-26	Hardy	
	8.	3,678,432		1972-07-18	Boliver	
	9.	3,686,603		1972-08-22	Lockie et al.	
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	11.	3,781,745		1973-12-25	Vadnagara	
	12.	3,795,757		1974-03-05	Higgins	
	13.	3,818,407		1974-06-18	Edgerton	
	14.	3,946,351		1976-03-23	Bronikowski et al.	
	15.	4,060,785		1977-11-29	Hanke et al.	
	16.	4,251,304		1981-02-17	Campbell et al.	
	17.	4,308,515		1981-12-29	Rooney et al.	
	18.	4,625,196		1986-11-25	Muench et al.	
	19.	4,778,948		1988-10-18	Fitch et al.	
	20.	4,780,598		1988-10-25	Fahey et al.	
	21.	4,947,149		1990-08-07	Pimpis et al.	
	22.	5,316,502		1994-05-31	Loet	
	23.	5,726,851		1998-03-10	Knapp	
	24.	5,903,209		1999-05-11	Stepniak	
	25.	7,387,537		2008-06-17	Daily	
	26.	7,422,458		2008-05-22	Arai	
	27.	8,207,637		2012-06-26	Marroquin et al.	
	28.	8,242,874		2009-12-17	Pavlovic et al.	
	29.	8,289,123		2007-01-25	Whitney et al.	
	30.	8,632,358		2014-01-21	Leonhard et al.	
	31.	8,657,624		2014-02-25	Yoshida	
	32.	8,699,209		2014-04-15	Barna	
	33.	8,723,370		2014-05-13	West	
	34.	8,779,627		2014-07-15	Gerhardinger et al.	

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U.S. PATENTS						
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
	35.	8,853,520		2014-10-07	Ueda et al.	
	36.	9,437,985		2016-09-06	Goyal et al.	
	37.	9,564,281		2017-02-07	Gilman et al.	
	38.	9,648,762		2017-05-09	Boe	
	39.	10,553,739		2020-02-04	Solon	
	40.	10,992,254		2021-04-27	Solon	
	41.	11,689,153		2023-06-27	Solon	

U.S. PATENT APPLICATION PUBLICATIONS						
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.	20020041944		2002-04-11	Stavnes et al.	
	2.	20050077994		2005-04-14	Martin et al.	
	3.	20050110607		2005-05-26	Babic et al.	
	4.	20070132539		2007-06-14	Richter et al.	
	5.	20080011347		2008-01-17	Aoyama et al.	
	6.	20090291594		2009-11-26	Donth et al.	
	7.	20100090851		2010-04-15	Hauser	
	8.	20100207716		2010-08-19	Yen	
	9.	20110104925		2011-05-05	Quiter et al.	
	10.	20110232963		2011-09-29	Kono et al.	
	11.	20110300730		2011-12-08	Someya	
	12.	20110308833		2011-12-22	West	
	13.	20120019346		2012-01-26	Levi	
	14.	20120161919		2012-06-28	Von zur Muehlen	
	15.	20120181973		2012-07-19	Lyden	
	16.	20120309232		2012-12-06	Darr et al.	
	17.	20120313278		2012-12-13	Nishio et al.	
	18.	20130037294		2013-02-14	Blaha et al.	
	19.	20130077249		2013-03-28	Guinn	
	20.	20130257154		2013-10-03	Tagliamonte	
	21.	20140113500		2014-04-24	Goyal et al.	
	22.	20160133422		2016-05-12	Breili	
	23.	20160149539		2016-05-26	Franke et al.	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	1.	2336459	CN		1999-09-01	YANG		
	2.	2411542	CN		2000-12-20	YANG		
	3.	1395056	CN		2003-02-05	CHEN		
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	5.	2785100	CN		2006-05-31	BAOSHENG TECHNOLOGY CO LTD		
	6.	201134283	CN		2008-10-15	SHANGHAI SHENGWU CABLE CO LTD		
	7.	101527235	CN		2009-09-09	YAN		
	8.	101577158	CN		2009-11-11	BENGBU DOUBLE CIRCLE ELECTRONICS		
	9.	201518320	CN		2010-06-30	SHENZHEN TRONY SOLAR CORP		
	10.	101923915	CN		2010-12-22	ZHANG		
	11.	201845580	CN		2011-05-25	ANHUI HUAYU CABLE GROUP CO LTD		
	12.	201877150	CN		2011-06-22	WUXI JIANGNAN CABLE CO LTD		
	13.	102117976	CN		2011-07-06	ANWELL TECHNOLOGIES LTD		
	14.	201975362	CN		2011-09-14	HOCHSPANNUNG GMBH		
	15.	201994507	CN		2011-09-28	DONGGUAN ANWELL DIGITAL MACH		
	16.	102332345	CN		2012-01-25	XINGLE CABLE CO LTD		
	17.	202153443	CN		2012-02-29	CHANGSHA ONRISE ELECTRONIC CO LTD		
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	20.	102568970	CN		2012-07-11	DONGGUAN SLOCABLE PHOTOVOLTAIC TECHNOLOGY CO LTD		
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	22.	202524026	CN		2012-11-07	SHANGHAI SHENGHUA ELECTRICAL CO LTD		
	23.	202758911	CN		2013-02-27	NEWSUN PV TECHNOLOGY CO LTD		
	24.	103000468	CN		2013-03-27	SHITEGE ASIA PACIFIC INVEST CO LTD		
	25.	202977351	CN		2013-06-05	STEGEY YATAI INVEST CO LTD		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	4	Of	6	Attorney Docket Number	S4079.10001US04

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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
	26.	103165235	CN		2013-06-19	SHANGHAI GAOQIAO CABLE FACTORY CO LTD		
	27.	203038709	CN		2013-07-03	WUXI JIANGNAN CABLE CO LTD		
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	29.	104021860	CN		2014-09-03	FAR EAST CABLE CO LTD		
	30.	203967369	CN		2014-11-26	TIANJIN 609 CABLE CO LTD		
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	33.	204760094	CN		2015-11-11	SHANGHAI ZABLE CABLE CO LTD		
	34.	6940839	DE		1971-04-01	BORGSMANN KG W		
	35.	102006032275	DE		2008-01-03	TYCO ELECTRONICS AMP GMBH		
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	41.	S59194327	JP		1984-11-05	KINPOU DENKI KK		
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	44.	3004630	JP		1994-11-22	KYOUICHI		
	45.	H08289450	JP		1996-11-01	CHUBU ELECTRIC POWER		
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	48.	2000004516	JP		2000-01-07	SUMITOMO ELECTRIC INDUSTRIES		
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	50.	2003031834	JP		2003-01-31	KUBOTA KK		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	5	Of	6	Attorney Docket Number	S4079.10001US04

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
<small>*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>			
<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>			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	18341655
				Filing Date	2023-06-26
				First Named Inventor	Dean Solon
				Art Unit	1726
				Examiner Name	Ryan Smith Cannon
Sheet	6	Of	6	Attorney Docket Number	S4079.10001US04

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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2024-01-19
Name/Print	Paul G. Johnson	Registration Number	58539
<p>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.</p>			

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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.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/341,655	06/26/2023	Dean Solon	S4079.10001US04	4873
97149	7590	01/12/2024	EXAMINER	
Maschoff Brennan 1389 Center Drive, Ste. 300 Suite 300 Park City, UT 84098			CANNON, RYAN SMITH	
			ART UNIT	PAPER NUMBER
			1726	
			NOTIFICATION DATE	DELIVERY MODE
			01/12/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

bisraelsen@mabr.com
d@mabr.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 102

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 (i.e., changing from AIA to pre-AIA) 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.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.

Claim(s) 1-3, 5-7, 9-12 and 15 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by JP2014050227A to Fujimoto (machine translation relied upon herein).

Regarding claims 1-3, 5-7, 9-12, and 15, Fujimoto teaches a lead assembly for electrically coupling one or more drop lines to a feeder cable (the limitation that the assembly is “for electrically coupling...” is an intended use limitation; Intended use limitations are given weight to the extent that the prior art structure is capable of performing the intended use. See MPEP § 2111.02, 2112.01 and 2114-2115; the analysis below will show that the reference’s structure is capable of capable of performing all of the recited intended uses), the lead assembly comprising

- A joint (coincident with 17 of Fig. 3) where a section of the feeder cable 15 and a section of the at least one or more drop lines 16 can be electrically coupled at a nexus (middle p. 3 of translation)
- A mold 18 that encapsulates the nexus, the mold further comprising
 - A feeder pathway extending completely through the mold and configured to allow the feeder cable 15 to extend completely through the mold (cable 15 takes up space within mold 18 that has the shape of a pathway)
 - One or more drop line pathways that each extend partially through the mold, and each configured to allow the one or more drop lines 16 to extend partially through the mold (cable 16 takes up space within mold 18 that has the shape of a pathway)
- Wherein each of the one or more drop lines 16 are configured to be capable of receiving electrical power from a plurality of solar panels 11 for combination at the nexus to the feeder cable 15 (middle p. 2 through middle p. 3 of translation).

Per claim 2, Fujimoto teaches the limitations of claim 1. The drop line 16 includes a section of exposed wire 16-1 at the nexus (*Ibid.*).

Per claim 3, Fujimoto teaches the limitations of claim 1. The feeder cable 15 includes a section of exposed wire 15-1 at the nexus (*Ibid.*).

Per claim 5, Fujimoto teaches the limitations of claim 1. The feeder cable 15 is configured to attach directly to an inverter 12 (*Ibid.*).

Per claim 6, Fujimoto teaches the limitations of claim 1. The feeder pathway is formed along a first longitudinal axis and the one or more drop line pathways are each formed along a longitudinal axis different from the first longitudinal axis (the drop line 16 follows a curved pathway in Fig. 3, whereas the feeder cable 15 follows a straight pathway).

Per claim 7, Fujimoto teaches the limitations of claim 1. The feeder pathway has a first diameter (at least that of feeder cable 15), and the one or more drop line pathways have a second diameter (at least that of drop line 16), wherein the second diameter is smaller than the first diameter (Fig. 3; MPEP §2125).

Per claims 9 and 10, Fujimoto teaches the limitations of claim 1. Each of the one or more drop lines 16 is configured to terminate at a drop line connector, each of the one or more drop line connectors is configured to connect to a wire harness 13 (multiple wires 14 feed into 13) that is configured to connect to a plurality of solar panels 11 (not illustrated in Fig. 2, *Ibid.*).

Per claim 11, Fujimoto teaches the limitations of claim 1. The combined electrical power received from the plurality of solar panels 11 is conducted directly to an inverter 12 electrically connected to the feeder cable 15 (*Ibid.*).

Per claim 12, Fujimoto teaches the limitations of claim 1. The lead assembly is configured to combine electrical power received from the plurality of solar panels 11 at the nexus and to deliver the combined electrical power to an inverter 12 that is in electrical communication with the feeder cable 15 (*Ibid.*).

Per claim 15, Fujimoto teaches the limitations of claim 1. The limitation that the mold is injection molded is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). MPEP §2113.1.

Claim(s) 1-3, 6, 15, and 16 is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by WO01/09990A1 to Harrison.

Regarding claims 1-3, 6, 15, and 16, Harrison teaches a lead assembly (Figs. 3-6, 11) for electrically coupling one or more drop lines to a feeder cable (the limitation that the assembly is “for electrically coupling...” is an intended use limitation; Intended use limitations are given weight to the extent that the prior art structure is capable of performing the intended use. See MPEP § 2111.02, 2112.01 and 2114-2115; the analysis below will show that the reference’s structure is capable of capable of performing recited intended uses), the lead assembly comprising

- A joint (coincident with 20) where a section of the feeder cable (in the embodiment of Fig. 3, the feeder cable 17 is severed; in an embodiment described in P14/L3-10, the feeder cable includes a tail attached by a crimp, this tail reads on a section of the feeder cable) and a section (33 or 32 of Fig. 7) of the at least one or more drop lines (extending from 4 in Fig. 7) can be electrically coupled at a nexus (insert 22 receives the tail and 33; P13/L6-19, P16/L11-16)
- A mold 2/3 (P14/L17-P15/L9, P17/L8-12) that encapsulates the nexus, the mold further comprising
 - A feeder pathway extending completely through the mold and configured to allow the feeder cable to extend completely through the mold (in the embodiment of Fig. 3, the feeder cable 17 is severed, but similar cables 10 are shown within the mold portion 2 and extending completely through the mold in a space shaped like a pathway; a skilled artisan would understand that in the alternative embodiment in which a section of the feeder cable is in the form of a tail attached by a crimp, the feeder cable 17 would extend completely through the mold)
 - One more drop line pathways that extend partially through the mold (the drop lines extend within a space in portion 3 of the mold shaped like a passageway), and each configured to allow the one or more drop lines to extend partially through the mold.

Each of the one or more drop lines are described as capable of conveying electricity through the nexus and from the feeder cable (P11/L17-P12/L9). The power originates from the mains or a power supply (P1/L15-P2/L13). Although the power supply is not recited as being from a plurality of solar panels, a skilled artisan would understand that each of the one or more drop lines are capable of receiving electrical power from a plurality of solar panels for combination at the nexus to the feeder cable.

Per claim 2, Harrison teaches the limitations of claim 1. The drop line includes a section of exposed wire at the nexus (Fig. 6).

Per claim 3, Harrison teaches the limitations of claim 1. The feeder cable includes a section of exposed wire at the nexus (a section of the feeder cable that is a tail attached by crimp would be exposed similar to that shown in Fig. 3).

Per claim 6, Harrison teaches the limitations of claim 1. The feeder pathway is formed along a first longitudinal axis (left-right in Fig. 6) and the one or more drop line pathways are each formed along a longitudinal axis (up-down in Fig. 6) different from the first longitudinal axis.

Per claim 15, Harrison teaches the limitations of claim 1. The mold 2/3 is injection molded (Ibid.).

Per claim 16, Harrison teaches the limitations of claim 1. The mold 2/3 comprises an undermold (see embodiment of Fig. 11), and the lead assembly further comprises an overmold 300 that encapsulates the undermold (P19/L13-19, P21/L1-5). The limitation that the overmold is injection molded is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). MPEP §2113.I.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim(s) 4 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto as applied to claim 1 above, and further in view of US PGPub 2010/0139733 to Jonczyk (included in Applicant's 9/27/2023 IDS).

Regarding claims 4, Fujimoto teaches the limitations of claim 1. The structure of the nexus is not described. Jonczyk teaches that it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to include a crimp, solder portion or splice in the nexus to provide electrical connection between such cables and lines (¶10025).

Claim(s) 8 and 13 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto as applied to claim 1 above, and further in view of US PGPub 2011/0011642 to Solon (included in Applicant's 9/27/2023 IDS).

Regarding claim 8, Fujimoto teaches the limitations of claim 1. Fujimoto teaches one drop line 16 connected to the feeder cable 17 at the joint (Fig. 3), and thus only teaches one drop line pathway. However, Solon teaches a similar lead assembly connecting drop lines (not labeled in Fig. 2, wire ending with analogous connector 28) that similarly collect electricity from a plurality of solar panels (¶0024) to a feeder cable (wire extending between element 22), and teaches that it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to connect more than one drop line at a junction as a matter of design (¶0025, 0026). Therefore a skilled artisan would also form two or more drop line pathways according to an obvious design.

Regarding claim 13, Fujimoto teaches the limitations of claim 1. Fujimoto does not teach a gauge of the wire that forms the drop lines. Solon teaches that it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to form such a line (not labeled in Fig. 2, wire ending with analogous connector 28) with a suitable gauge of 8 or 12 gauge (claim 11). The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.).

Claim(s) 14 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto as applied to claim 1 above, and further in view of US PGPub 2013/0269746 to Ramsey (included in Applicant's 9/27/2023 IDS). Supporting information is provided by US PGPub 2009/0300909 to Kummer and US PGPub 2011/0174521 to Hernandez (both included in 9/27/2023 IDS).

Regarding claim 14, Fujimoto teaches the limitations of claim 1. Fujimoto does not teach a diameter of the feeder cable. ¶0023 of Kummer and Table 1 of Hernandez teach that 1000 MCM wire has a diameter of 28.39 mm. Ramsey teaches that the gauge of a wire can be varied according to the current being carried on the wire (¶0005, 0008, 0009, 0025). Therefore it would have been obvious as of

the effective filing date of the claimed invention for a person having ordinary skill in the art to vary the size of the wire that forms the feeder cable according to the current being carried on the wire. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.).

Claim(s) 17, 18, and 20 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto, and further in view of Solon.

Regarding claims 17, 18, and 20, Fujimoto teaches a lead assembly comprising

- A joint (coincident with 17 of Fig. 3) where a section of the feeder cable 15 and a section of a drop lines 16 can be electrically coupled at a nexus (middle p. 2 through middle of p. 3 of translation), the drop line connected to a wire harness 13 (multiple wires 14 feed into 13) and configured to receive power from a plurality of solar panels
- A primary mold 18 that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions (“The branch portion where the sleeve 17 is located employs a resin mold 18 in order to perform insulation treatment and waterproof treatment.”), the primary mold further comprising
 - A feeder pathway configured to allow the feeder cable 15 to extend completely through the primary mold (cable 15 takes up space within mold 18 that has the shape of a pathway)

- A drop line pathway that is configured to allow the drop line 16 to extend partially through the primary mold (cable 16 takes up space within mold 18 that has the shape of a pathway).

Fujimoto teaches a section of one drop line 16 connected to the feeder cable 17 at the nexus (Fig. 3), and thus only teaches one drop line pathway. However, Solon teaches a similar lead assembly connecting drop lines (not labeled in Fig. 2, wire ending with analogous connector 28) that similarly collect electricity from a plurality of solar panels (¶0024) to a feeder cable (wire extending between element 22), and teaches that it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to connect more than one drop line connected to a wire harness at a nexus as a matter of design (¶0025, 0026). Therefore a skilled artisan would also form two or more drop line pathways that are each configured to allow the two drop lines to extend partially through the primary mold according to an obvious design.

Per claim 18, modified-Fujimoto teaches the limitations of claim 17. The feeder cable 17 is directly electrically connected to an inverter 12 (Ibid.).

Per claim 20, modified-Fujimoto teaches the limitations of claim 17. The electrical power received from the plurality of solar panels 11 is combined at the nexus and conducted directly to an inverter 12 electrically connected to the feeder cable 17 (Ibid.).

Claim(s) 19 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto and Solon as applied to claim 17 above, and further in view of US Patent 5,316,789 to Ookuma (included in Applicant's 9/27/2023 IDS).

Regarding claim 19, modified-Fujimoto teaches the limitations of claim 17. Fujimoto does not teach that the mold is an undermold. Ookuma also teaches a mold (11 of Fig. 2) within which a nexus (6) between cables and lines (5) is formed (C3/L55-61, C4/L17-29), wherein an overmold (1 of Fig. 2, 1/4 of

Fig. 5) is formed to surround the undermold and form an undermold-overmold at an outer surface of the undermold, so as to establish a double water-proofing around the nexus (C4/L38-43, C4/L60-C5/L10). Therefore it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to form an overmold encapsulating the primary mold of modified-Fujimoto, forming an undermold-overmold interface at an outer surface of the primary mold, in order to double waterproof the joint.

Claim(s) 21 is/are rejected under 35 U.S.C. 103 as being unpatentable over Fujimoto and Solon as applied to claim 17 above, and further in view of US PGPub 2011/0209741 to Solon II (included in Applicant's 9/27/2023 IDS).

Regarding claim 21, modified-Fujimoto teaches the limitations of claim 17. Fujimoto does not teach a voltage rating of the lead assembly. Solon II teaches that it would have been obvious as of the effective filing date of the claimed invention for a person having ordinary skill in the art to form a lead assembly to carry a voltage of 1500 VDC (¶0030). The use of a known technique to improve similar devices (methods or products) in the same way is likely to be obvious. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, C.).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan S Cannon whose telephone number is (571)270-7186. The examiner can normally be reached M-F, 8:30am-5:30pm PST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Barton can be reached on (571) 272-1307. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ryan S. Cannon
Primary Examiner
Art Unit 1726

/RYANS CANNON/
Primary Examiner, Art Unit 1726

Notice of References Cited	Application/Control No. 18/341,655		Applicant(s)/Patent Under Reexamination Solon, Dean	
	Examiner Ryan S Cannon		Art Unit 1726	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
	A					
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N	JP-2014050227-A	2014-03-17	JP	FUJIMOTO T	
	O	WO-0109990-A1	2001-02-08	WO	HARRISON C A	B29C45/14639
	P	JPH02023016A	1990-01-25	JP		
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine translation of JP2014-05227A (Year: 2014)
	V	Machine translation of JPH2-023016A (Year: 1990)
	W	
	X	

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

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20240108

<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

CPC - Searched*		
Symbol	Date	Examiner
H01L31/0422,0424,0482,0484,05	1/16/2014	ERS
E04D3/40	1/17/2014	ERS
H01L31/02013,02008,02021	7/1/2014	ERS
H02S40/00-38	5/23/2014	ERS
H01R4/187,18,70	11/30/2017	ERS
H01R3-13/All	4/17/2020	ERS
H01R11/11	4/17/2020	ERS
H01R4/021,023,5205	4/17/2020	ERS
H01R13/5205	4/17/2020	ers
H01R4/027,10	4/17/2020	ERS
H01R9/0509	4/17/2020	ERS
H02S40/30,36	6/16/2022	RS
H01R4/All	6/16/2022	RS
H01R9/All	6/16/2022	RS
H01R13/All	06/16/2022	RS
H01R24/All	06/16/2022	RS
H01R25/All	6/16/2022	RS

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

US Classification - Searched*			
Class	Subclass	Date	Examiner
52	173.3	7/16/2013	ERS
136	243-265	7/16/2013	ERS

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

Search Notes		
Search Notes	Date	Examiner
Keyword search in USPC subclasses, CPC subgroups, IPC subgroups (see EAST history for search strategy)	5/23/2017	ERS
Inventor search in DAV	5/24/2017	ERS
Keyword search in CPC subgroups (see EAST history for search strategy)	11/30/2017	ERS
Update inventor search in DAV	11/30/2017	ERS
Consulted Fritz Fleming in AU2836	9/13/2018	ERS
Keyword search in EAST databases (see EAST history for search strategy)	9/14/2018	ERS
Updated inventor search in DAV	9/18/2018	ERS
Updated inventor search in DAV	6/6/2019	ERS
Keyword search in EAST databases (see EAST history for search strategy)	6/6/2019	ERS
Search consult with Examiner James Harvey in AU 2833	4/16/2020	ERS
Keyword search in EAST databases (see EAST history for search strategy)	5/8/2020	ERS
Updated inventor search in DAV	5/8/2020	ERS
Updated inventor search in DAV	2/1/2021	ERS
Keyword search in CPC subgroups	6/16/2022	RS
Inventor search in DAV	6/16/2022	RS
Used AI "More Like This Document" tool in P2E2 Search on previously acquired art	2/27/2023	RSC
Updated inventor search	2/27/2023	RSC
Updated inventor search	3/13/2023	RSC
MLTD search of prior art	1/8/2024	RSC
Updated inventor search	1/8/2024	RSC

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<i>Search Notes</i> 	Application/Control No. 18/341,655	Applicant(s)/Patent Under Reexamination Solon, Dean
	Examiner Ryan S Cannon	Art Unit 1726

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
H02S40	30	2/1/2021	ERS
H01R9	03,0509	2/1/2021	ERS
H01R4	70,187,18,70,021,023,5205	2/1/2021	ERS
H01R11	11	2/1/2021	ERS
H01R3	All	2/1/2021	ERS
H01R4	70	3/13/2023	RSC
H01R9	03	3/13/2023	RSC
H02S40	30	3/13/2023	RSC

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L776	49	(Artificial Intelligence) More like doc: JP-2003293536-A Text: (JP-3652318-B2 OR JP-2003041715-A OR JP-H11159063-A OR JP-3588541-B2 OR EP- 1270842-B1 OR EP- 1270842-A1 OR AU- 2009292594-B2 OR AU-2009292594-A1 OR JP-2011163062-A OR JP-2000352154-A OR AU-2009292595-A1 OR JP-7364579-B2 OR AU- 2009292595-B2 OR JP- 2002170978-A OR CN- 102137976-B OR JP- 2002070271-A OR CN- 102137976-A OR JP- 7324214-B2 OR JP- 2005332860-A OR AU- 2009292594-A8).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 03:06 PM
L778	37	(Artificial Intelligence) More like doc: US-20100139733-A1 Text: (AU-2010212421-A1 OR EP-2287915-A1 OR EP-2287915-B1 OR ES-2399972-T3 OR CN-101997241-A OR US-20130176662-A1 OR CA-2800420-A1 OR US-8699209-B2 OR CA-2800420-C OR US- 9437985-B2 OR US- 20150140849-A1 OR US-8911264-B2 OR WO-2014066019-A2 OR CA-2886060-A1 OR US-20140113500-A1 OR CN-104380483-B OR US-9553225-B2 OR CN-104380483-A OR CA-2886060-C OR EP- 2837039-B1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/01/08 03:21 PM
L790	45	(Artificial Intelligence) More like doc: US-20110011642-A1 Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2024/01/08 06:44 PM

		(WO-2011008574-A1 OR CA-2768374-A1 OR US-20140041935-A1 OR US-20140041934-A1 OR US-20140284101-A1 OR CA-2768374-C OR US-8604342-B2 OR US-20110209741-A1 OR CN-104078793-A OR CN-216529435-U OR CN-102403385-A OR US-20130255999-A1 OR CN-201853720-U OR JP-2002184513-A OR CN-110476258-A OR KR-102597494-B1 OR WO-2018178292-A3 OR DE-102017106997-A1 OR US-8366471-B2 OR WO-2008095670-A1).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PE2E SEARCH - Search History (Similarity Search)

No Similarity Results available

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)

Approved for use through 05/31/2024. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		18341655	
	Filing Date		2023-06-26	
	First Named Inventor	Dean Solon		
	Art Unit	OPAP		
	Examiner Name	Not Yet Assigned		
	Attorney Docket Number	S4079.10001US04		

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	1831002		1931-11-10	Hickey	
	2	3852516	A	1974-12-03	Henry et al.	
	3	5316789	A1	1994-05-31	Ookuma et al.	
	4	6265665	B1	2001-07-24	Zahnen	
	5	6268559	B1	2001-07-31	Yamawaki	
	6	8604342	B2	2013-12-10	Solon	
	7	8911264	B2	2014-12-16	Goyal et al.	
	8	8937249	B2	2015-01-20	Solon	
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Application Number	18341655
Filing Date	2023-06-26
First Named Inventor	Dean Solon
Art Unit	OPAP
Examiner Name	Not Yet Assigned
Attorney Docket Number	S4079.10001US04

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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	20090088032	A1	2009-04-02	Keeven et al.	
	2	20090300909	A1	2009-12-10	Kummer et al.	
	3	20100139733	A1	2010-06-10	Jonczyk et al.	
	4	20100258157	A1	2010-10-14	Arai	
	5	20110011642	A1	2011-01-20	Solon	
	6	20110174521	A1	2011-07-21	Hernandez-Hernandez et al.	
	7	20110209741	A1	2011-09-01	Solon	
	8	20120085040	A1	2012-04-12	Ketwitz, Jr.	
	9	20120125395	A1	2012-05-24	Bellacicco et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

**INFORMATION DISCLOSURE
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Application Number	18341655
Filing Date	2023-06-26
First Named Inventor	Dean Solon
Art Unit	OPAP
Examiner Name	Not Yet Assigned
Attorney Docket Number	S4079.10001US04

10	20120217973	A1	2012-08-30	Avrutsky	
11	20130269746	A1	2013-10-17	Ramsey	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	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
	1	202797033	CN	U	2013-03-13	JIANGSU JIUDING SOLAR ENERGY SYSTEM CO LTD		☒
	2	202006007613	DE	U1	2006-08-17	BECK MANFRED		☒
	3	102008027189	DE	A1	2009-01-15	PFEFFER ROLAND		☒
	4	2983361	FR	A1	2013-05-31	BECHET MICHEL		☒
	5	2003293536	JP	A	2003-10-15	UMEOKA TAKASHI		☒
	6	90/011608	WO		1990-10-04	SKYLINE HOLDING AG		☒
	7	2012/023748	WO	A2	2012-02-23	MS TECHVISION CO., LTD.		☒

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		18341655	
	Filing Date		2023-06-26	
	First Named Inventor	Dean Solon		
	Art Unit	OPAP		
	Examiner Name	Not Yet Assigned		
	Attorney Docket Number	S4079.10001US04		

	8	2012/083785	WO	A1	2012-06-28	DONGGUAN ANWELL DIGITAL MACHINERY CO., LTD.	☒
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NON-PATENT LITERATURE DOCUMENTS

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	Definition of "working voltage" [retrieved from https://encyclopedia2.thefreedictionary.com/voltage+rating on September 18, 2018].	☐
	2	"Wire Gauges-Current Ratings" [retrieved from https://web.archive.com/org/web/20140715051530/www.engineeringtoolbox.com/wire-gauges-d_419.html on June 6, 2019] (Year: 2015).	☐
	3	PRNewswire, Molded In-line Fuse From Amphenol Protects Against Ground Fault Damage, published May 4, 2012, retrieved December 22, 2022 from: https://www.prnewswire.com/news-releases/molded-in-line-fuse-from-amphenol-protects-against-ground-fault-damage-150186315.html	☐

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Examiner Signature	/RYAN S CANNON/	Date Considered	01/08/2024
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	18341655
Filing Date	2023-06-26
First Named Inventor	Dean Solon
Art Unit	OPAP
Examiner Name	Not Yet Assigned
Attorney Docket Number	S4079.10001US04

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).

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- ☐ 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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2023-09-27
Name/Print	Paul G. Johnson	Registration Number	58539

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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APPLICATION #
18/341,655

RECEIPT DATE / TIME
11/10/2023 05:08:17 PM Z ET

ATTORNEY DOCKET #
S4079.10001US04

Title of Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 4873

FILED BY JOLIN JOHNSON

PATENT CENTER # 63215972

FILING DATE 06/26/2023

CUSTOMER # 97149

FIRST NAMED INVENTOR Dean Solon

CORRESPONDENCE ADDRESS -

AUTHORIZED BY Paul Johnson

Documents

TOTAL DOCUMENTS: 3

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
S4079.10001US04_2023-11-10_PreliminaryAmendment.pdf		6	-	161 KB
S4079.10001US04_2023-11-10_PreliminaryAmendment-A.PE.pdf	(1-1)	1	Preliminary Amendment	99 KB
S4079.10001US04_2023-11-10_PreliminaryAmendment-CLM.pdf	(2-5)	4	Claims	126 KB
S4079.10001US04_2023-	(6-6)	1	Applicant Arguments/Remarks	100 KB
				118

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10_PreliminaryAmendment-
REM.pdf

Made in an Amendment

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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S4079.10001US04_2023-11-10_PreliminaryAmendment-A.PE.pdf	36596E8E38849C091C50EB3225B4F53A1073E8CEA517AEC377268DF38705F630CB358BB1B188E223AE20CED0FD2DABC2CA521355B49EC6D98812115C4C267B15
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S4079.10001US04_2023-11-10_PreliminaryAmendment-REM.pdf	6E51BBBCD63CF5B0250E63281BF6A2B507A21A8246ACDF9D057F91D83F6C20D400A929E1F44B121E9C82B12E6624F15A7A44F37E7C0F6F3A1BEF104541100EB2

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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.

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119

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Dean Solon	Art Unit OPAP
Application No.:	18/341,655	
Filed:	June 26, 2023	
Conf. No.:	4873	
For:	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER	
Examiner:	Unassigned	
Customer No.:	97149	
Attorney Docket No.:	S4079.10001US04	

PRELIMINARY AMENDMENT UNDER 37 C.F.R. §1.115

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

Dear Commissioner:

Applicants respectfully request entry of the following preliminary amendment.

Amendments to the Claims are reflected in the listing of claims which begins on page 2
of this paper.

Remarks begin on page 6 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

1. **(Currently Amended)** A lead assembly for electrically coupling one or more drop lines to a feeder cable, the lead assembly comprising:

a joint where a section of the feeder cable and a section of the at least one or more drop lines can be electrically coupled at a nexus; and

~~an undermold~~ a mold that encapsulates the nexus, the ~~undermold~~ further comprising:

a feeder pathway extending completely through the ~~undermold~~ and configured to allow the feeder cable to extend completely through the ~~undermold~~; and

one or more drop line pathways that each extend partially through the ~~undermold~~, and each configured to allow one of the one or more drop lines to extend partially through the ~~undermold~~; [[and]]

~~an overmold encapsulating the undermold,~~

wherein each of the one or more drop lines are configured to be capable of receiving electrical power from a plurality of solar panels for combination at the nexus to the feeder cable.

2. **(Original)** The lead assembly of claim 1, wherein the drop line includes a section of exposed wire at the nexus.

3. **(Original)** The lead assembly of claim 1, wherein the feeder cable includes a section of exposed wire at the nexus.

4. **(Original)** The lead assembly of claim 1, wherein the nexus includes at least one of a compression lug, a solder portion, a splice, and a crimp.

5. **(Original)** The lead assembly of claim 1, wherein the feeder cable is configured to attach directly to an inverter.

6. **(Original)** The lead assembly of claim 1, wherein the feeder pathway is formed along a first longitudinal axis and the one or more drop line pathways are each formed along a longitudinal axis different from the first longitudinal axis.
7. **(Original)** The lead assembly of claim 1, wherein the feeder pathway has a first diameter, and the one or more drop line pathways have a second diameter, wherein the second diameter is smaller than the first diameter.
8. **(Original)** The lead assembly of claim 1, comprising two or more drop line pathways.
9. **(Original)** The lead assembly of claim 1, wherein each of the one or more drop lines is configured to terminate at a drop line connector.
10. **(Original)** The lead assembly of claim 9, wherein each of the one or more drop line connectors is configured to connect to a wire harness that is configured to connect to a plurality of solar panels.
11. **(Original)** The lead assembly of claim 1, wherein the combined electrical power received from the plurality of solar panels is conducted directly to an inverter electrically connected to the feeder cable.
12. **(Original)** The lead assembly of claim 1, wherein the lead assembly is configured to combine electrical power received from the plurality of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder cable.
13. **(Original)** The lead assembly of claim 1, wherein the one or more drop lines each includes a wire of between four (4) to eighteen (18) gauge.
14. **(Original)** The lead assembly of claim 1, wherein the feeder cable includes a wire of between 250 MCM to 1000 MCM.

15. **(Currently Amended)** The lead assembly of claim 1, wherein the ~~under~~mold is injection molded.
16. **(Currently Amended)** The lead assembly of claim 1, wherein:
the mold comprises an undermold;
the lead assembly further comprises an overmold that encapsulates the undermold;
the overmold is injection molded.
17. **(Currently Amended)** A lead assembly comprising:
a joint where a section of a feeder cable and a section of each of two drop lines can be electrically coupled at a nexus, each of the two drop lines connected to a wire harness and configured to receive power from a plurality of solar panels;
a primary mold that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:
a feeder pathway configured to allow the feeder cable to extend completely through the ~~primary mold~~undermold; and
two drop line pathways that are each configured to allow the two drop lines to extend partially through the ~~primary mold~~undermold.
18. **(Original)** The lead assembly of claim 17, wherein the feeder cable is directly electrically connected to a component selected from the group consisting of a trunk buss jumper, an inverter, a connection unit, a recombiner, and a disconnect unit.
19. **(Original)** The lead assembly of claim 17, further comprising a secondary mold encapsulating the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold.
20. **(Original)** The lead assembly of claim 17, wherein electrical power received from the plurality of solar panels is combined at the nexus and conducted directly to an inverter electrically connected to the feeder cable.

21. **(New)** The lead assembly of claim 17, wherein the lead assembly has a voltage rating of at least 1000 VDC.

REMARKS

The amendments herein have been made not in response to any rejection or objection posed by the Examiner. The foregoing amends claims 1 and 15-17 and adds new claim 21. Claims 1-21 are now pending in view of the amendments. Applicant respectfully requests entry of the amendments herein prior to examination of the application and favorable consideration of the pending claims.

In the event that Examiner finds remaining impediment to allowance of this application that may be clarified through a telephone interview or overcome by an Examiner's Amendment, Examiner is requested to contact the undersigned attorney.

Dated this 10th day of November, 2023.

Respectfully submitted,

/Paul G. Johnson/

PAUL G. JOHNSON
Registration No. 58539
Attorney for Applicant
Customer No. 97149
Telephone No. (435) 252-1360

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 18/341,655		Filing Date 06/26/2023		☐ 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), (l), 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(j))		minus 20 =	*		x \$40 =							
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*		x \$192 =							
☐ 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	11/10/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)					
	Total (37 CFR 1.16(j))	* 21	Minus	** 20	= 1	x \$40 =	40					
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 2	= 0	x \$192 =	0					
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE		40				
AMENDMENT		(Column 1)	(Column 2)		(Column 3)							
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)					
	Total (37 CFR 1.16(j))	*	Minus	**	=	x \$0 =						
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =						
	☐ Application Size Fee (37 CFR 1.16(s))											
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
						TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LDRC						
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.												

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/341,655	06/26/2023	Dean Solon	S4079.10001US04

CONFIRMATION NO. 4873

97149

Maschoff Brennan

1389 Center Drive, Suite 300

Park City, UT 84098

PUBLICATION NOTICE



OC000000063457699

Date Mailed: 10/19/2023

Title: LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Publication No. US-2023-0336118-A1

Publication Date: 10/19/2023

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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.

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APPLICATION #
18/341,655

RECEIPT DATE / TIME
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S4079.10001US04

Title of Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 4873

FILED BY JoLin Johnson

PATENT CENTER # 62884026

FILING DATE 06/26/2023

CUSTOMER # 97149

FIRST NAMED
INVENTOR Dean Solon

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Paul Johnson

Documents

TOTAL DOCUMENTS: 12

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
S4079.10001US04_IDS_09-27-2023.pdf	6	Information Disclosure Statement (IDS) Form (SB08)	1235 KB
CN202797033U.pdf	6	Foreign Reference	513 KB
DE202006007613U1.pdf	8	Foreign Reference	445 KB
DE102008027189 A1.pdf	9	Foreign Reference	483 KB
FR2983361A1.pdf	20	Foreign Reference	694 KB
JP2003293536A.pdf	21	Foreign Reference	1628 KB
WO90011608.pdf	16	Foreign Reference	645 KB

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WO2012023748A2.pdf	22	Foreign Reference	916 KB
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WO2012083785A1.pdf	68266A4F8B4BA9C76875D17682DC61F6286632BFD54B7DEFB 118493D21EDF188D39904C82BD1E1D0C071684BE98DA64687 D8D05C1BE4F7570E889EE235111D0F
NPL_Definitionofworkingvoltage .pdf	E517EA779B611FB4FC2491360F68668ABD03B2A46CEA73DB7 066B87857B2FED144052C03496134C065F1AAEE406CF5C749 D5B736CF51A458BD22E251F9B8BE35
NPL_Wire-Gauges.pdf	2F6667BC4FEC86E70522C88A981BBB8159071C344A5CF22D2 BBDEAFE33C883855296A3DFA5292A64DBE97B64B1489BD045 08E9EE4991F107662822F1BA560AA1
NPL_PRNewswire.pdf	BB90578A97CF5840823648A571577382AB8E9619B7025F4DD8 401A211B8384CED03FAA21F2E1706AE23A6A210FD2407188B BC371CD2F21A8F13A5BFC80730FB3

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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)

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	Filing Date		2023-06-26
	First Named Inventor	Dean Solon	
	Art Unit	OPAP	
	Examiner Name	Not Yet Assigned	
	Attorney Docket Number	S4079.10001US04	

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	1	1831002		1931-11-10	Hickey	
	2	3852516	A	1974-12-03	Henry et al.	
	3	5316789	A1	1994-05-31	Ookuma et al.	
	4	6265665	B1	2001-07-24	Zahnen	
	5	6268559	B1	2001-07-31	Yamawaki	
	6	8604342	B2	2013-12-10	Solon	
	7	8911264	B2	2014-12-16	Goyal et al.	
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Application Number	18341655
Filing Date	2023-06-26
First Named Inventor	Dean Solon
Art Unit	OPAP
Examiner Name	Not Yet Assigned
Attorney Docket Number	S4079.10001US04

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	1	20090088032	A1	2009-04-02	Keeven et al.	
	2	20090300909	A1	2009-12-10	Kummer et al.	
	3	20100139733	A1	2010-06-10	Jonczyk et al.	
	4	20100258157	A1	2010-10-14	Arai	
	5	20110011642	A1	2011-01-20	Solon	
	6	20110174521	A1	2011-07-21	Hernandez-Hernandez et al.	
	7	20110209741	A1	2011-09-01	Solon	
	8	20120085040	A1	2012-04-12	Ketwitz, Jr.	
	9	20120125395	A1	2012-05-24	Bellacicco et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		18341655	
	Filing Date		2023-06-26	
	First Named Inventor	Dean Solon		
	Art Unit	OPAP		
	Examiner Name	Not Yet Assigned		
	Attorney Docket Number	S4079.10001US04		

	10	20120217973	A1	2012-08-30	Avrutsky	
	11	20130269746	A1	2013-10-17	Ramsey	

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	1	202797033	CN	U	2013-03-13	JIANGSU JIUDING SOLAR ENERGY SYSTEM CO LTD		☒
	2	202006007613	DE	U1	2006-08-17	BECK MANFRED		☒
	3	102008027189	DE	A1	2009-01-15	PFEFFER ROLAND		☒
	4	2983361	FR	A1	2013-05-31	BECHET MICHEL		☒
	5	2003293536	JP	A	2003-10-15	UMEOKA TAKASHI		☒
	6	90/011608	WO		1990-10-04	SKYLINE HOLDING AG		☒
	7	2012/023748	WO	A2	2012-02-23	MS TECHVISION CO., LTD.		☒

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		18341655	
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	First Named Inventor	Dean Solon		
	Art Unit	OPAP		
	Examiner Name	Not Yet Assigned		
	Attorney Docket Number	S4079.10001US04		

	8	2012/083785	WO	A1	2012-06-28	DONGGUAN ANWELL DIGITAL MACHINERY CO., LTD.	☒
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	1	Definition of "working voltage" [retrieved from https://encyclopedia2.thefreedictionary.com/voltage+rating on September 18, 2018].	☐
	2	"Wire Gauges-Current Ratings" [retrieved from https://web.archive.com/org/web/20140715051530/www.engineeringtoolbox.com/wire-gauges-d_419.html on June 6, 2019] (Year: 2015).	☐
	3	PRNewswire, Molded In-line Fuse From Amphenol Protects Against Ground Fault Damage, published May 4, 2012, retrieved December 22, 2022 from: https://www.prnewswire.com/news-releases/molded-in-line-fuse-from-amphenol-protects-against-ground-fault-damage-150186315.html	☐

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Examiner Signature		Date Considered	
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*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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	18341655
	Filing Date	2023-06-26
	First Named Inventor	Dean Solon
	Art Unit	OPAP
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	S4079.10001US04

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	/Paul G. Johnson/	Date (YYYY-MM-DD)	2023-09-27
Name/Print	Paul G. Johnson	Registration Number	58539

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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
18/341,655	06/26/2023		664	S4079.10001US04	20	2

CONFIRMATION NO. 4873

FILING RECEIPT



0000000059323128

97149

Maschoff Brennan
1389 Center Drive, Suite 300
Park City, UT 84098

Date Mailed: 07/14/2023

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Dean Solon, Gallatin, TN;

Applicant(s)

SHOALS TECHNOLOGIES GROUP, LLC, Portland, TN;

Assignment For Published Patent Application

SHOALS TECHNOLOGIES GROUP, LLC, Portland, TN

Power of Attorney: The patent practitioners associated with Customer Number 97149

Domestic Priority data as claimed by applicant

This application is a CON of 17/301,609 04/08/2021 PAT 11,689,153
which is a CON of 14/849,458 09/09/2015 PAT 10,992,254
which claims benefit of 62/047,773 09/09/2014

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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If Required, Foreign Filing License Granted: 07/13/2023

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/341,655**

Projected Publication Date: 10/19/2023

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Preliminary Class

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

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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.

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page 2 of 4

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).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #
18/341,655

RECEIPT DATE / TIME
06/26/2023 07:25:24 PM ET

ATTORNEY DOCKET #
S4079.10001US04

Title of Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 4873

FILED BY Brian Gonzalez

PATENT CENTER # 62340192

AUTHORIZED BY Eric Maschoff

CUSTOMER # 97149

FILING DATE -

CORRESPONDENCE
ADDRESS -

FIRST NAMED
INVENTOR Dean Solon

Payment Information

PAYMENT METHOD
CARD / 5003

PAYMENT TRANSACTION ID
E20236PJ 29049904

PAYMENT AUTHORIZED BY
Brian Gonzalez

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2111	UTILITY PATENT APPL. SEARCH FEE	280.00	1	280.00
4011	BASIC FILING FEE- UTILITY	64.00	1	64.00
2311	EXAMINATION OF ORIGINAL PATENT APPLICATION	320.00	1	320.00
TOTAL AMOUNT:				\$664.00

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.

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for 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.

**TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE
REGISTERED PRACTITIONERS**

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	Not yet Assigned		
Filing Date	June 26, 2023		
First Named Inventor	Dean Solon		
Title	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		
Art Unit	Not yet assigned		
Examiner Name	Not yet assigned		
Attorney Docket Number	S4079.10001US04		
SIGNATURE of Applicant or Patent Practitioner			
Signature	/ERIC L. MASCHOFF/	Date	June 26, 2023
Name	Eric Maschoff	Telephone	(435) 252-1360
Registration Number	36596		

MASCHOFF BRENNAN, PLLC
1389 Center Drive, SUITE 300
PARK CITY, UTAH 84098, USA

POWER OF ATTORNEY BY APPLICANT

[Assignee, Legal Representative or Person with Proprietary Interest]

I hereby revoke all previous powers of attorney given in the application identified in the attached Transmittal for Power of Attorney form.

- I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter:

97149

Please recognize or change the correspondence address for the above-identified patent to:

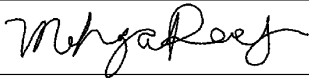
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I am the Applicant:

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☐ Legal Representative of a Deceased or Legally Incapacitated Inventor
☐ Person Who Otherwise Shows Sufficient *Proprietary* Interest (e.g., a petition under 37 CFR 1.46 (b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

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

Signature		Date	August 25, 2021
Name	Mehgan Peetz	Telephone	6153887696
Company	SHOALS TECHNOLOGIES GROUP, LLC	Title	CLO

NOTE: Signature - This form must be signed by the applicant or applicant's representative in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below*.

*Total of 1 forms are submitted.

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**LEAD ASSEMBLY FOR CONNECTING
SOLAR PANEL ARRAYS TO INVERTER**

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is a Continuation Application of 17/301,609, filed April 8, 2021,
entitled LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO
INVERTER, which is a Continuation Application of 14/849,458, filed September 9, 2015,
entitled LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO
INVERTER, which claims the benefit of and priority from the United States provisional patent
10 application entitled PRE-PANELIZED THIN FILM, RACK, CONNECTORLESS DUAL
CORDPLATE, MOBILE SKIDGET, POWERHOUSE AND BLA TRUNK BUSS, which
was filed on September 9, 2014, and assigned the serial number 62/047,773, all of which are
incorporated herein by reference in their entireties.

BACKGROUND

15 Disclosed embodiments relate to electrical components, and more specifically to
assemblies for connecting solar panel arrays to an inverter, without the need of a combiner
box.

 As depicted in FIG. 1, a conventional solar power configuration includes a plurality of
20 solar panels 30 each connected to a central combiner box 36, and a plurality of combiner boxes
(not shown) connected to an inverter. The inverter converts the direct current (DC) generated
by the solar panels into alternating power (AC), which goes in the "grid".

 The configuration of FIG. 1 has been simplified in recent years by the wire harness of
US Patent 8,604,342 which issued 12/10/13; and US Applications 14/057,089 filed 10/18/13;
25 and 14/296,726 filed 6/5/14, all of which are hereby incorporated by reference. More
specifically, as shown in FIG. 2, wire harnesses 34 connect multiple solar panels 30 in an
array 32, so each array has a single input via wire harness 34 into the combiner box. This has
drastically reduced the number of connections going into a combiner box, which is safer, more
reliable, easier to install, maintain and troubleshoot, and saves money over the conventional
30 configuration of FIG. 1.

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Unfortunately, however, a combiner box is still a necessary component in known solar power installations because the energy coming from solar arrays must be combined prior to going into the inverter. Combiner boxes are problematic because they are clumsy, prone to damage and malfunctioning, must be periodically maintained, and require extensive planning and skill for installation. Due to the many connections going into a combiner box, a combiner box cannot easily be moved without disconnecting and reconnecting all the connections and wiring, which requires considerable manpower, danger, and expense.

As can be seen, there is a need for a device that renders a combiner box unnecessary. It is desirable that this device is small, inexpensive to manufacture and transport, and easy to use. It is also desirable that the device is extremely durable and can be adapted for a variety of circumstances.

SUMMARY OF DISCLOSED EMBODIMENTS

Disclosed embodiments are directed to a lead assembly including at least one drop line joined to a feeder cable at a nexus. The assembly is preferably undermolded and overmolded at the nexus. In use, the drop line is connected to solar arrays, and the feeder cable is connected to an inverter, or to a buss trunk jumper, which connects to the inverter. In this manner a plurality of solar arrays are electrically coupled together, with a common feeder cable connecting them all to the inverter. Alternatively, a plurality of feeder cables can be connected end to end, optionally terminating in a buss trunk jumper, for connection to an inverter. A combiner box is not necessary, and in fact would be redundant. In line fuses may be integrated into drop lines.

The terminal end of each drop line includes a drop line connector for fast and easy connection to the wire harness that interconnects the solar panels of a solar array. A lead assembly preferably includes one or two drop lines, depending on the particular configuration in a solar field. A lead assembly preferably includes a capping end piece at one end of the feeder cable, and a feeder cable connector at the other end. The feeder cable connector would plug into an inverter, buss trunk jumper, or possibly another feeder cable.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a conventional wiring configuration with each solar panel individually wired to a central combiner box;

FIG. 2 depicts an improved but known wiring configuration with solar panels harnessed together to form solar arrays, with each solar array individually wired to a central combiner box;

FIG. 3 depicts the present invention of a plurality of wire harnesses coupled to a lead assembly that connects to an inverter, with the unnecessary combiner box shown for demonstration only;

FIG. 4 schematically represents a system of the present invention;

FIG. 5 depicts a positive lead assembly having a single drop line per joint;

FIG. 6 depicts a negative lead assembly having a single drop line per joint;

FIG. 7 schematically depicts a joint with a compression lug;

FIG. 8 depicts a single drop joint;

FIG. 9 depicts a configuration where a lead assembly has a single drop line as may be appropriate in use with crystalline panels;

FIG. 10 depicts a configuration where a lead assembly has a single drop line as may be appropriate in use with thin film panels;

FIGS. 11-12 depict the overmold for a dual drop lead assembly for 250 mcm cable;

FIGS. 13-14 depict the overmold for a dual drop lead assembly for 750MCM cable;

FIGS. 15-16 depict the undermold for a dual drop lead assembly for 250MCM cable;

FIGS. 17-18 depict the undermold for a dual drop lead assembly for 750MCM cable;

FIGS. 19-20 depict the overmold for a single drop lead assembly for 250MCM cable;

FIGS. 21-22 depict the overmold for a single drop lead assembly for 750MCM cable;

FIGS. 23-24 depict the undermold for a single drop lead assembly for 250MCM cable;

FIGS. 25-26 depict the undermold for a single drop lead assembly for 750MCM cable;

FIG. 27 depicts two lead assemblies with single drop, with the lower assembly including in line fuses;

FIG. 28 depicts a spooled lead assembly with single drop;

FIG. 29 depicts a dual drop lead assembly for 750MCM cable;

FIG. 30 depicts a single drop lead assembly for 750MCM cable;

FIG. 31 depicts a dual drop lead assembly for 750MCM cable with overmold shown;

FIG. 32 depicts the overmold for a dual drop lead assembly for 750MCM cable;
FIG. 33 depicts a dual drop lead assembly for 750MCM cable with undermold shown;
FIG. 34 depicts the undermold for a dual drop lead assembly for 750MCM cable;
FIG. 35 depicts a dual drop lead assembly for 750MCM cable with compression lug
5 shown;
FIG. 36 depicts the compression lug for a dual drop lead assembly for 750MCM cable;
FIG. 37 depicts a dual drop lead assembly for 750MCM cable with wires exposed at
nexus;
FIG. 38 depicts the end piece for a dual drop lead assembly for 750MCM cable;
10 FIG. 39 depicts a single drop lead assembly for 750MCM cable with overmold shown;
FIG. 40 depicts the overmold for a dual single lead assembly for 750MCM cable;
FIG. 41 depicts a single drop lead assembly for 750MCM cable with undermold
shown;
FIG. 42 depicts the undermold for a single drop lead assembly for 750MCM cable;
15 FIG. 43 depicts a single drop lead assembly for 750MCM cable with compression lug
shown;
FIG. 44 depicts the compression lug for a single drop lead assembly for 750MCM
cable;
FIG. 45 depicts a single drop lead assembly for 750MCM cable with wires exposed at
20 nexus;
FIG. 46 depicts the end piece for a single drop lead assembly for 750MCM cable;
FIG. 47 depicts a dual drop lead assembly for 250MCM cable;
FIG. 48 depicts a single drop lead assembly for 250MCM cable with the overmold
depicted in phantom;
25 FIG. 49 depicts a dual drop lead assembly for 250MCM cable with overmold shown;
FIG. 50 depicts the overmold for a dual drop lead assembly for 250MCM cable;
FIG. 51 depicts a dual drop lead assembly for 250MCM cable with undermold shown;
FIG. 52 depicts the undermold for a dual drop lead assembly for 250MCM cable;
FIG. 53 depicts a dual drop lead assembly for 250MCM cable with wires exposed at
30 nexus;

FIG. 54 depicts the end of string for a dual drop lead assembly for 250MCM cable with the overmold depicted in phantom;

FIG. 55 depicts a single drop lead assembly for 250MCM cable with the overmold depicted in phantom;

5 FIG. 56 depicts the overmold for a single drop lead assembly for 250MCM cable;

FIG. 57 depicts a single drop lead assembly for 250MCM cable with undermold shown;

FIG. 58 depicts the undermold for a single drop lead assembly for 250MCM cable;

10 FIG. 59 depicts a single drop lead assembly for 250MCM cable with wires exposed at nexus;

FIG. 60 depicts the end of string for a single drop lead assembly for 250MCM cable with the overmold depicted in phantom; and

FIG. 61 depicts a compression lug.

15 DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

The following detailed description describes exemplary embodiments of the invention. The description is not to be taken in a limiting sense but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

20 The following structure numbers shall apply to the following structures among the various FIGS.:

- 10 — Lead assembly;
- 12 — Drop line;
- 25 13 — Drop line connector;
- 14 — Feeder cable;
- 15 — Feeder cable connector;
- 16 — Insulation;
- 17 — Joint;
- 30 18 — Exposed wire;
- 19 — Nexus;

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- 20 — Compression lug;
- 22 — Undermold;
- 24 — Overmold;
- 25 — Aperture;
- 5 27 — Trunk buss jumper;
- 29 — In line fuse;
- 30 — Solar panel;
- 32 - Solar array;
- 34 —Wire harness;
- 10 35 — Wire harness connector;
- 36 — Combiner box; and
- 38 — Inverter.

Referring to FIG. 3, a system of the present invention generally includes a plurality of
15 solar panels 30 that are electrically coupled to form solar arrays 32a, 32b, and so forth. Panels
30 are preferably coupled using wire harnesses 34 which are commercially available from
Shoals Technologies Group of Portland, TN. Each wire harness includes a plurality of
branches each connecting to one solar panel, and a central trunk that terminates in wire harness
connector 35. Each wire harness is connected at wire harness connector 35 to drop line
20 connector 13 (not shown) of lead assembly 10.

As shown in FIG. 3, solar arrays 32a, 32b and 32c are connected to a lead assembly
10. A single lead assembly 10 can reasonably accommodate approximately 200Kw.

While FIG. 5 depicts a positive lead assembly having in line fuses 29, and FIG. 6
depicts a negative lead assembly without in line fuses, it should be understood that positive
25 lead assemblies may lack in line fuses and negative lead assemblies may include in line fuses.

Referring now to FIG. 5, lead assembly 10 generally includes drop line 12 joined to
feeder cable 14 at joint 17. As shown in FIG. 35, the drop line and feeder cable are held
together by compression lug 20, which is surrounded by undermold 22 (FIG. 33), which is
surrounded by overmold 24 (FIG. 29). Overmold 24 preferably defines at least one aperture
30 25 for receiving zip-ties, and the like, for securing the assembly upon installation.

Each drop line 12 terminates in drop line connector 13, which connects drop line 12 to wire harness connector 35. Drop line 12 is preferably constructed of 18 to 4 gauge wire, and drop line connectors 13 are preferably off-the-shelf connectors such as MC4/ PV-KBT4/61-UR & PV-KST4/61-UR from Multi-Contact of Windsor, CA .Joint 17 of lead assembly 10 may include a single drop line 12, as shown in FIG. 30, or dual drop lines 12, as shown in FIG 29, corresponding with connecting to a single wire harness or two wire harnesses, respectively. Whether a single or dual drop line is most suitable depends on the configuration of the solar arrays in a field.

By way of example and referring to FIG. 10, in a solar installation having thin film panels, which occupy a large area of space, it may be advantageous to employ single drop assemblies because it is impractical to physically reach wire harnesses that are very spread out. Alternatively and referring to FIG. 9, in a solar installation having crystalline panels, which occupy a smaller area of space, it may be advantageous to employ dual drop assemblies because the associated wire harnesses are relatively close to one another and can be connected to a single lead assembly.

It is also important to understand that the configuration of a particular lead assembly can be modified to accommodate different solar installations. For example, joints 17 and corresponding drop lines 12 can be spaced close together (approximately 15 cm), or far apart (approximately 15000 cm), along feeder cable 14, depending on the density of solar panels. Also, spacing of joints 17 and corresponding drop lines 12 can vary on a single lead assembly.

Each feeder cable 14 terminates in feeder cable connector 15, which connects to trunk buss jumper 27 (FIG. 27), to inverter 38 (FIG. 3), or to connection unit, recombiner, or disconnect unit (not shown). Trunk buss jumper 27 is essentially an "extension cord" which is economical to use in some configurations, for example where portions of feeder cable 14 are installed at different times. In another situation, trunk buss jumper 27 could be buried underground and feeder cable 14 above ground. Being able to install these components independent of one another can offer much more diversity. Trunk buss jumper 27 could also be utilized if there are a significant number of varying lengths from solar array 32 to inverter 38. Trunk buss jumper 27 could also be utilized if there is a substantial distance (greater than >50 meters) to travel from closest solar array 32 to inverter 38 and it would be wasteful to use a lead assembly with unused drop lines. The other end of feeder cable 14 terminates in joint

17 having end piece 26, which is typically installed at the solar array located furthest from the inverter. In alternative embodiments, feeder cable 14 includes feeder cable connector 15 at both terminal ends so feeder cables 14 can be connected one-to-another in an end-to-end orientation. In yet another embodiment, one or both ends of feeder cables 14 are blunt cut for subsequent manual connection, for example stripping and crimping to connectors or other segments of feeder cable.

Feeder cable 14 is preferably constructed of 6 gauge to 1000 MCM wire, with the specific wire chosen based on factors such as the number of associated drop lines and the distance between the connection and downstream inverter and whether or not feeder cable 14 is of aluminum or copper construction. Feeder cable connectors 15 are preferably off-the-shelf connectors such as KBT10BV & KST10BV from Multi-Contact of Windsor, CA.

Referring to FIG. 37, drop line 12 and feeder cable 14 electrically couple at nexus 19 of joint 17. This is preferably accomplished by stripping wire insulation 16 from corresponding segments of drop line 12 and feeder cable 14, adjoining respective segments of exposed wire 18, and securing contact between the segments of exposed wire by employing compression lug 20. It should be understood that securing contact between the segments could be achieved by other means including soldering, splicing, crimping, and so forth. Compression lug 20 is preferably surrounded by undermold 22, which is preferably composed of RTP 2099E x 127663 from RTP Co. of Winona, MN that has been applied by injection molding. As shown in FIG. 48, undermold 22 is preferably surrounded by overmold 24, which is preferably composed of RTP 199 x 124807 from RTP Co of Winona, MN that has been applied by injection molding. The resulting assembly is profoundly durable, resistant to environmental factors such as temperature fluctuations, debris, and moisture, and is strong enough to be buried.

In an alternative embodiment, there is no undermold, just an overmold, which is applied in a single molding process.

It is a very important feature that a system of the present invention doesn't require a combiner box. Rather, lead assemblies 10 effectively "combine" the power from solar arrays 32 and deliver it to inverter 38. As shown in FIG. 3, the present invention also eliminates the need of DC feeders, which would carry power from the combiner box to the inverter in a conventional system. Also, the need for fuses can be eliminated by using drop lines including

in line fuses 29, as shown in the lower assembly of FIG. 27. Appropriate fuses include of HP10x from Mersen of Newburyport, MA.

An embodiment of the present invention preferably has the following specifications: Voltage rating of 600 VDC / 1000 VDC / 1500 VDC; Maximum branch current of 30 amps
5 per string; Maximum overcurrent protection of 30 amps per string; maximum trunk cable size of 750MCM; and Maximum ambient operating temperature of 50° C, although other embodiments beyond these specifications are within the scope of the inventions.

It should also be understood that the illustrations are for the purpose of describing a preferred embodiment of the inventions and are not intended to limit the inventions thereto.
10 By way of example, the present invention can be scaled up or down to accommodate any feeder cable size, including the common 250 and 750MCM cable sizes. Also, while the current invention has been described in association with DC applications, it should be understood that it could also be implemented into feeders deployed in AC systems, which would negate the need for AC recombiner boxes. It should also be understood that approximations allow
15 variances of +/- 10%, unless otherwise noted or nonsensical such as a length less than zero. It should also be understood that all ranges set forth inherently include the endpoints themselves, as well as all increments, there between.

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CLAIMS

What is claimed is:

1. A lead assembly for electrically coupling one or more drop lines to a feeder cable, the lead assembly comprising:
 - 5 a joint where a section of the feeder cable and a section of the at least one or more drop lines can be electrically coupled at a nexus;
 - an undermold that encapsulates the nexus, the undermold further comprising:
 - a feeder pathway extending completely through the undermold and configured to allow the feeder cable to extend completely through the undermold; and
 - 10 one or more drop line pathways that each extend partially through the undermold, and each configured to allow one of the one or more drop lines to extend partially through the undermold; and
 - an overmold encapsulating the undermold,
 - wherein each of the one or more drop lines are configured to be capable of receiving
 - 15 electrical power from a plurality of solar panels for combination at the nexus to the feeder cable.
 2. The lead assembly of claim 1, wherein the drop line includes a section of exposed wire at the nexus.
 - 20 3. The lead assembly of claim 1, wherein the feeder cable includes a section of exposed wire at the nexus.
 4. The lead assembly of claim 1, wherein the nexus includes at least one of a compression lug, a solder portion, a splice, and a crimp.
 - 25 5. The lead assembly of claim 1, wherein the feeder cable is configured to attach directly to an inverter.

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6. The lead assembly of claim 1, wherein the feeder pathway is formed along a first longitudinal axis and the one or more drop line pathways are each formed along a longitudinal axis different from the first longitudinal axis.

5 7. The lead assembly of claim 1, wherein the feeder pathway has a first diameter, and the one or more drop line pathways have a second diameter, wherein the second diameter is smaller than the first diameter.

8. The lead assembly of claim 1, comprising two or more drop line pathways.

10

9. The lead assembly of claim 1, wherein each of the one or more drop lines is configured to terminate at a drop line connector.

10. The lead assembly of claim 9, wherein each of the one or more drop line connectors is
15 configured to connect to a wire harness that is configured to connect to a plurality of solar panels.

11. The lead assembly of claim 1, wherein the combined electrical power received from the plurality of solar panels is conducted directly to an inverter electrically connected to the
20 feeder cable.

12. The lead assembly of claim 1, wherein the lead assembly is configured to combine electrical power received from the plurality of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder
25 cable.

13. The lead assembly of claim 1, wherein the one or more drop lines each includes a wire of between four (4) to eighteen (18) gauge.

14. The lead assembly of claim 1, wherein the feeder cable includes a wire of between 250
30 MCM to 1000 MCM.

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15. The lead assembly of claim 1, wherein the undermold is injection molded.

16. The lead assembly of claim 1, wherein the overmold is injection molded.

5

17. A lead assembly comprising:

a joint where a section of a feeder cable and a section of each of two drop lines can be electrically coupled at a nexus, each of the two drop lines connected to a wire harness and configured to receive power from a plurality of solar panels;

10 a primary mold that encapsulates the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:

a feeder pathway configured to allow the feeder cable to extend completely through the undermold; and

15 two drop line pathways that are each configured to allow the two drop lines to extend partially through the undermold.

18. The lead assembly of claim 17, wherein the feeder cable is directly electrically connected to a component selected from the group consisting of a trunk buss jumper, an inverter, a connection unit, a recombiner, and a disconnect unit.

20

19. The lead assembly of claim 17, further comprising a secondary mold encapsulating the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold.

25

20. The lead assembly of claim 17, wherein electrical power received from the plurality of solar panels is combined at the nexus and conducted directly to an inverter electrically connected to the feeder cable.

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ABSTRACT

A lead assembly includes a plurality of drop lines joined to a feeder cable at joints each having a compression lug that is preferably surrounded by undermolding and overmolding. In use, each drop line is connected to a solar array, and the feeder cable is connected to an inverter. In this manner a plurality of solar arrays are electrically coupled together, with a common feeder cable connecting them all to the inverter. A system of the present invention doesn't require a combiner box which is conventionally employed directly upstream of the inverter.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

As the below named inventor, I hereby declare that:

This declaration
is directed to:



The attached application, or



United States application or PCT international application number _____

filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that 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.

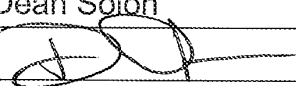
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LEGAL NAME OF INVENTOR

Inventor: Dean Solon

Date (Optional): 09/09/2015

Signature: 

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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 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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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/341,655

RECEIPT DATE / TIME
06/26/2023 07:25:24 PM ET

ATTORNEY DOCKET #
S4079.10001US04

Title of Invention

LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 4873

FILED BY Brian Gonzalez

PATENT CENTER # 62340192

FILING DATE -

CUSTOMER # 97149

FIRST NAMED
INVENTOR Dean Solon

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Eric Maschoff

Documents

TOTAL DOCUMENTS: 6

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023.06.26 ADS_S4079.10001US04.pdf	8	Application Data Sheet	2174 KB
2023.06.26 POA_S4079.10001US04.pdf	2	Power of Attorney	120 KB
2023.06.26 Continuation Application_S4079.10001US 04-APP.TEXT.docx	13	Application body structured text document	34 KB
Warning: All artifacts (SmartArt, Drawings, Charts, etc) have been replaced with images.			
2023.06.26 Declaration_S4079.10001US	2	Oath or Declaration filed	238 KB

160

04.pdf

2023.06.26 Continuation Figures_S4079.10001US04.pdf	26	Drawings-only black and white line drawings	549 KB
2023.06.26 Continuation Application_S4079.10001US 04.pdf	13	Auxiliary PDF of Application	179 KB

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DOCUMENT	MESSAGE DIGEST(SHA-512)
2023.06.26 ADS_S4079.10001US04.pdf	0B1928AEC36C796BD499C28EF18B5270860A0EF1B0188B7C2 41853D4F75348538A50DA4489CAF3376DBEFF393767F79C871 1F36FE84B350D453A61061DBCB166
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2023.06.26 Continuation Application_S4079.10001US04- APP.TEXT.docx	0EAD961A9DA02E0AB791E1187C4687FABBD6918C9A0ED932 93F3948D5D56FA4A3D08DC3AD529946DBF102621134A0556C 2B746EED291FE30F05D16E936FC099D
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2023.06.26 Continuation Figures_S4079.10001US04.pdf	5198BF22237FCA4B3722B46141E4B0AD4040E79CF2BEC4F24 2D2CF31C7DDB4EA0FAD84E7FE3A483CE36A0FCAFE2D2F29 F38989B7EAC48FEF620B9848D8FA568F
2023.06.26 Continuation Application_S4079.10001US04. pdf	69C9C347014BC14E3ED85FA2D0DDAB8380E85AC4C222DDA1 1560C94971F6C0DE1B63B6A028B74751ED57848C558B9408CF 60F48F889DF5811BD9312B24651606

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If a new application is being filed and the application includes the necessary components for 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

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		
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.			

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☐	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.)
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Prefix	Given Name		Middle Name		Family Name		Suffix
	Dean				Solon		
Residence Information (Select One)							☒ US Residency ☐ Non US Residency ☐ Active US Military Service
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Customer Number	97149	
Email Address	docket@mabr.com	Add Email Remove Email

Application Information:

Title of the Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		
Attorney Docket Number	S4079.10001US04	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	26	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		

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For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

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.

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When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	17301609	2021-04-08	11689153	2023-06-27

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number		S4079.10001US04	
		Application Number			
Title of Invention		LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER			
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17301609	Continuation of	14849458	2015-09-09	10992254	2021-04-27
Prior Application Status		Expired		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
14849458	Claims benefit of provisional	62047773	2014-09-09		
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Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove
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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: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is 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 State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee	☐ Legal Representative under 35 U.S.C. 117	☐ Joint Inventor	
☐ Person to whom the inventor is obligated to assign.	☐ Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor: <input type="text"/>			
If the Applicant is an Organization check here. ☒			
Organization Name	SHOALS TECHNOLOGIES GROUP, LLC		
Mailing Address Information For Applicant:			
Address 1	1400 Shoals Way		
Address 2			
City	Portland	State/Province	TN
Country	US	Postal Code	37148
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the 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	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

[Remove](#)

If the Assignee or Non-Applicant Assignee is an Organization check here.



Organization Name

SHOALS TECHNOLOGIES GROUP, LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1

1400 Shoals Way

Address 2

City

Portland

State/Province

TN

Countryⁱ

US

Postal Code

37148

Phone Number

Fax Number

Email Address

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

[Add](#)**Signature:**[Remove](#)

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/ERIC L. MASCHOFF/		Date (YYYY-MM-DD)	2023-06-26	
First Name	Eric	Last Name	Maschoff	Registration Number	36596
Additional Signature may be generated within this form by selecting the Add button.					

[Add](#)

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	S4079.10001US04
		Application Number	
Title of Invention	LEAD ASSEMBLY FOR CONNECTING SOLAR PANEL ARRAYS TO INVERTER		

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.

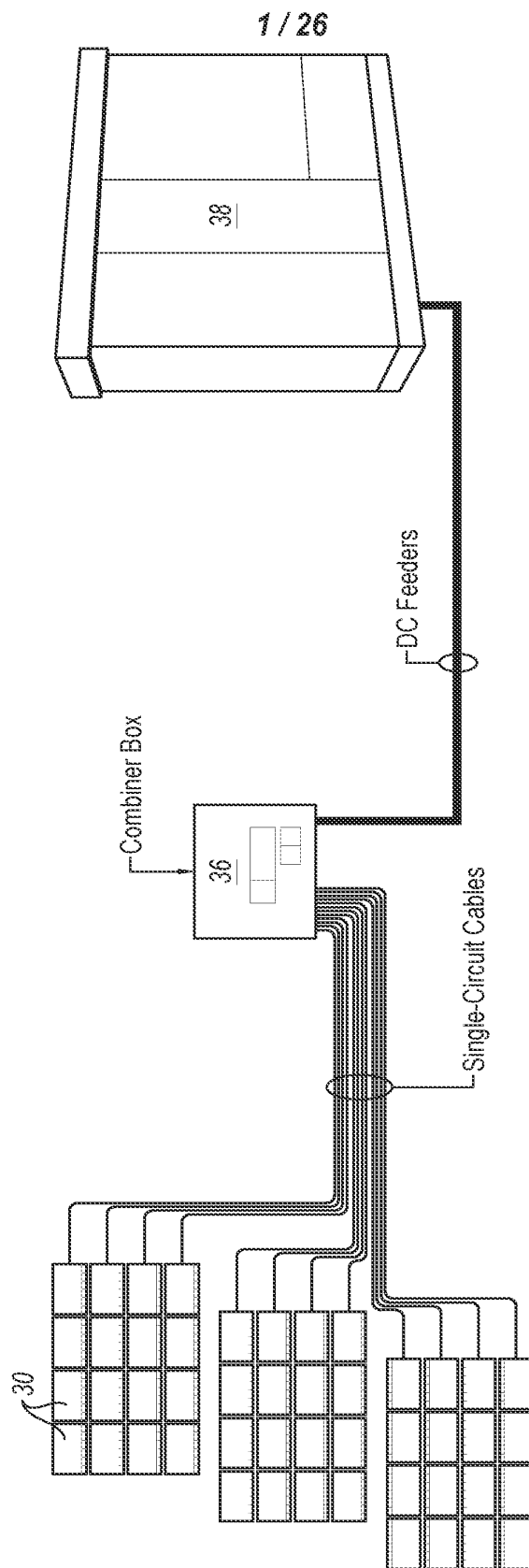


FIG. 1
Prior Art

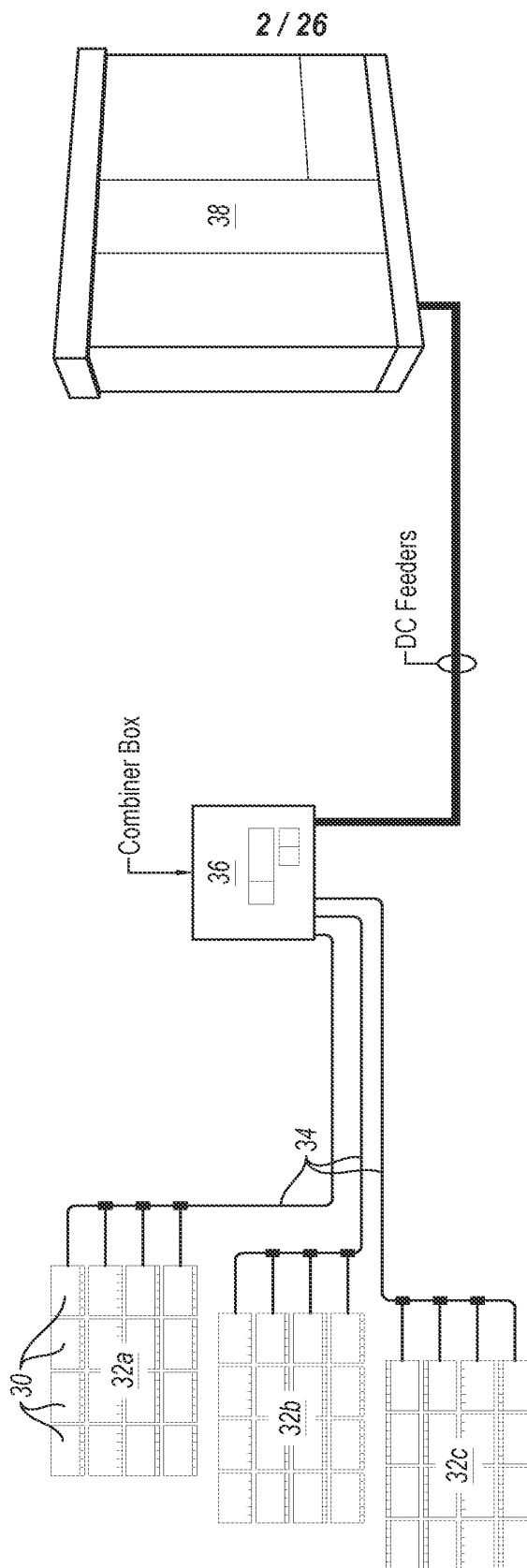


FIG. 2
Prior Art

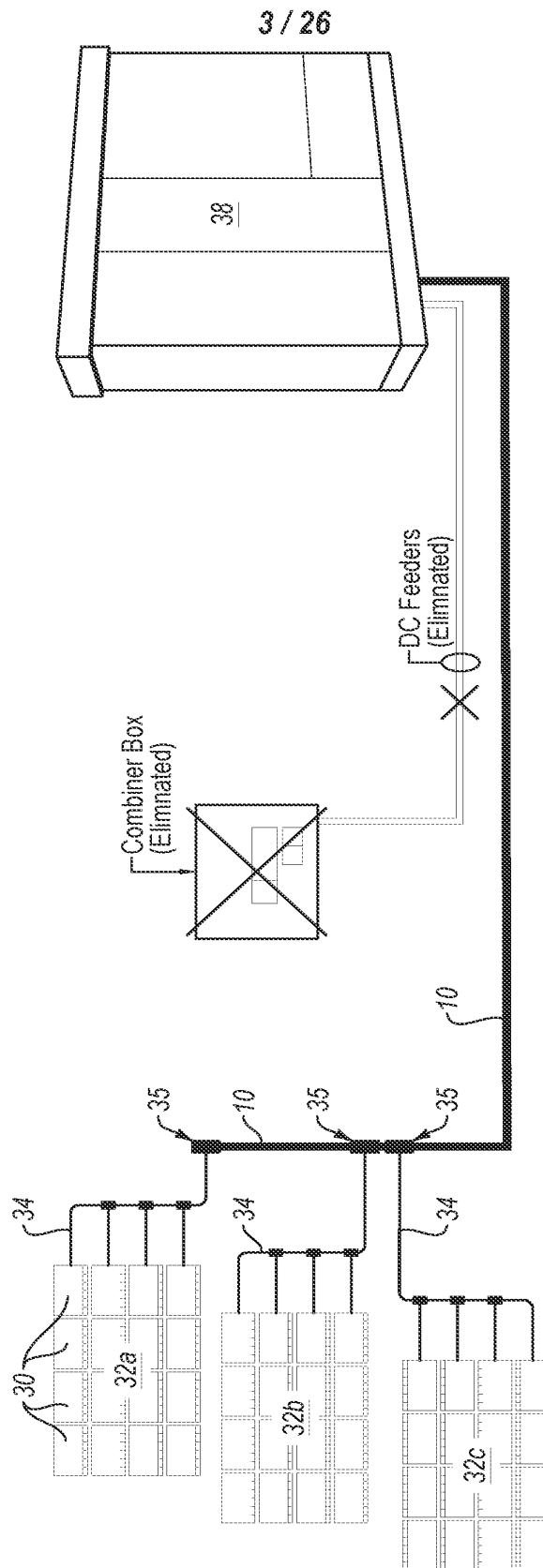


FIG. 3

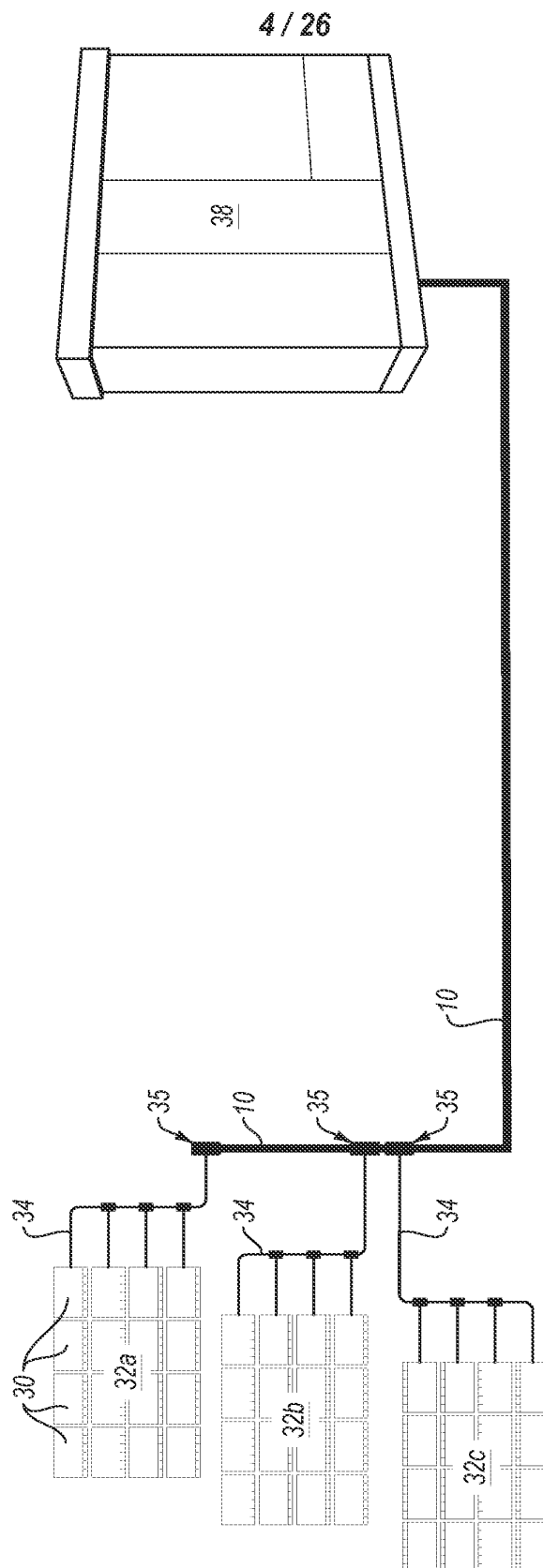


FIG. 4

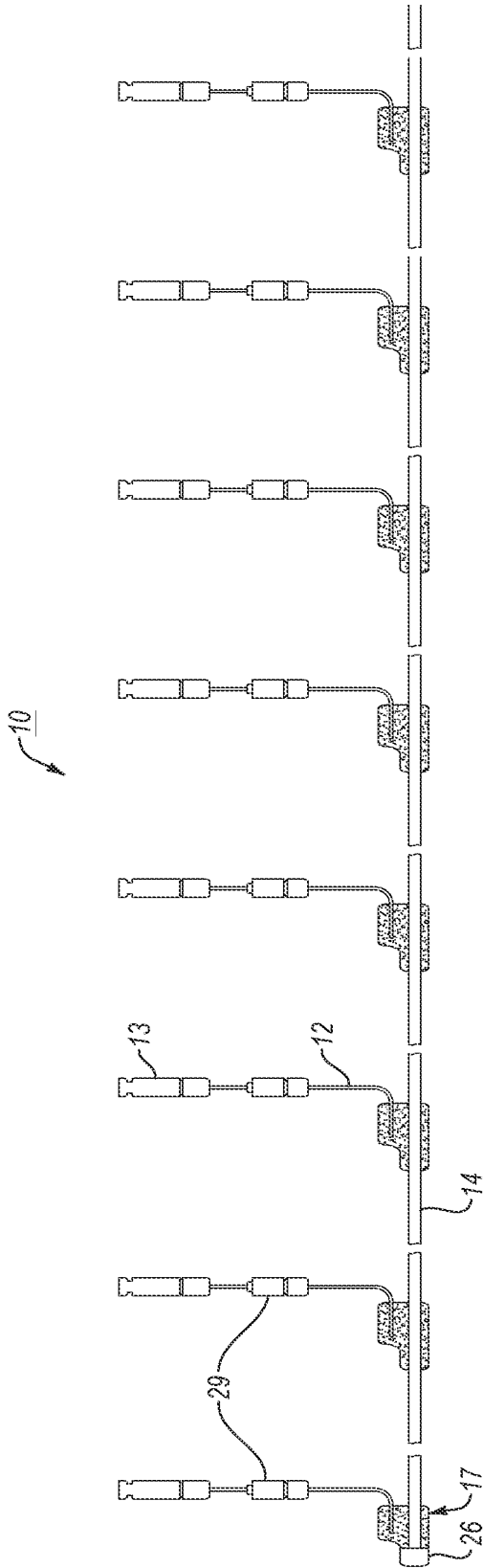


FIG. 5

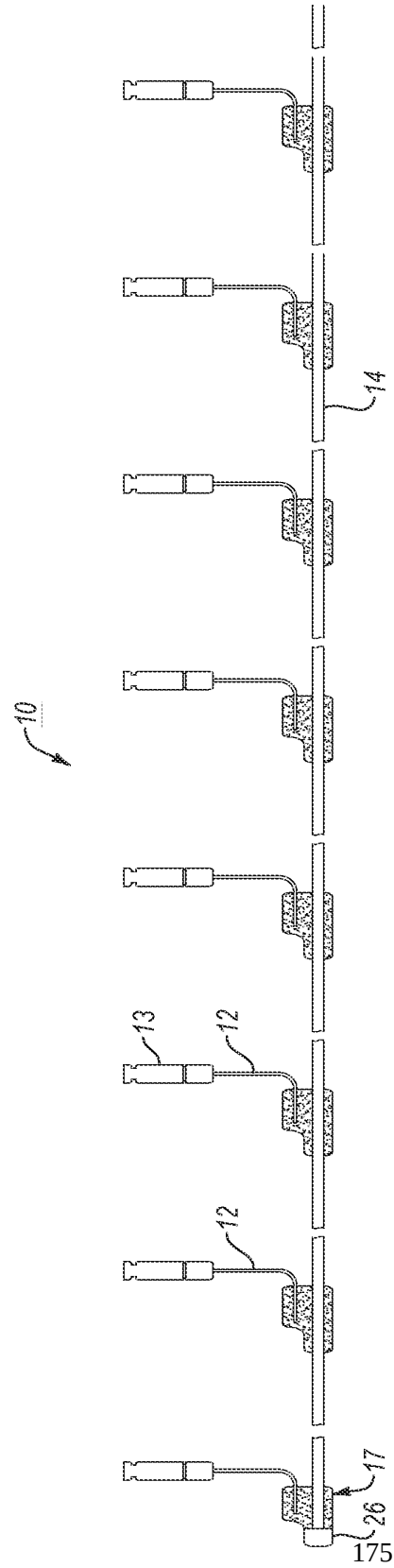


FIG. 6

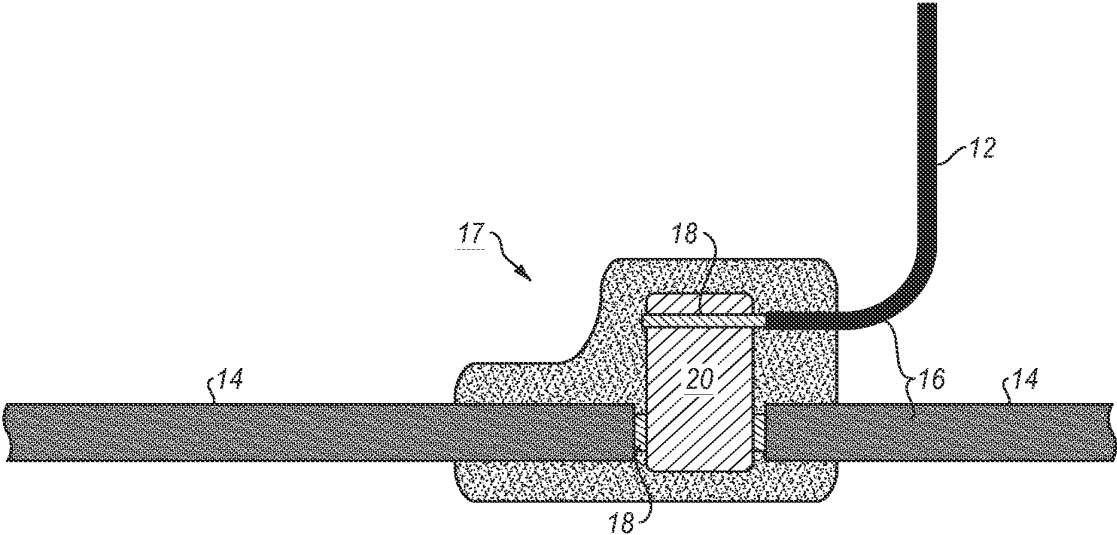


FIG. 7

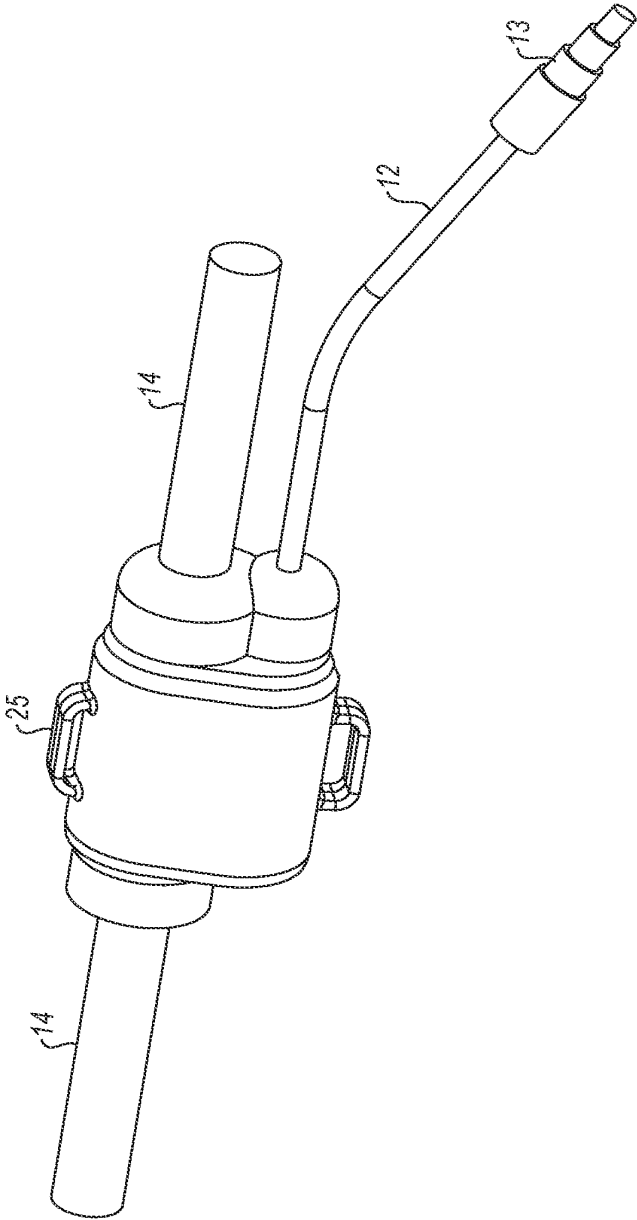


FIG. 8

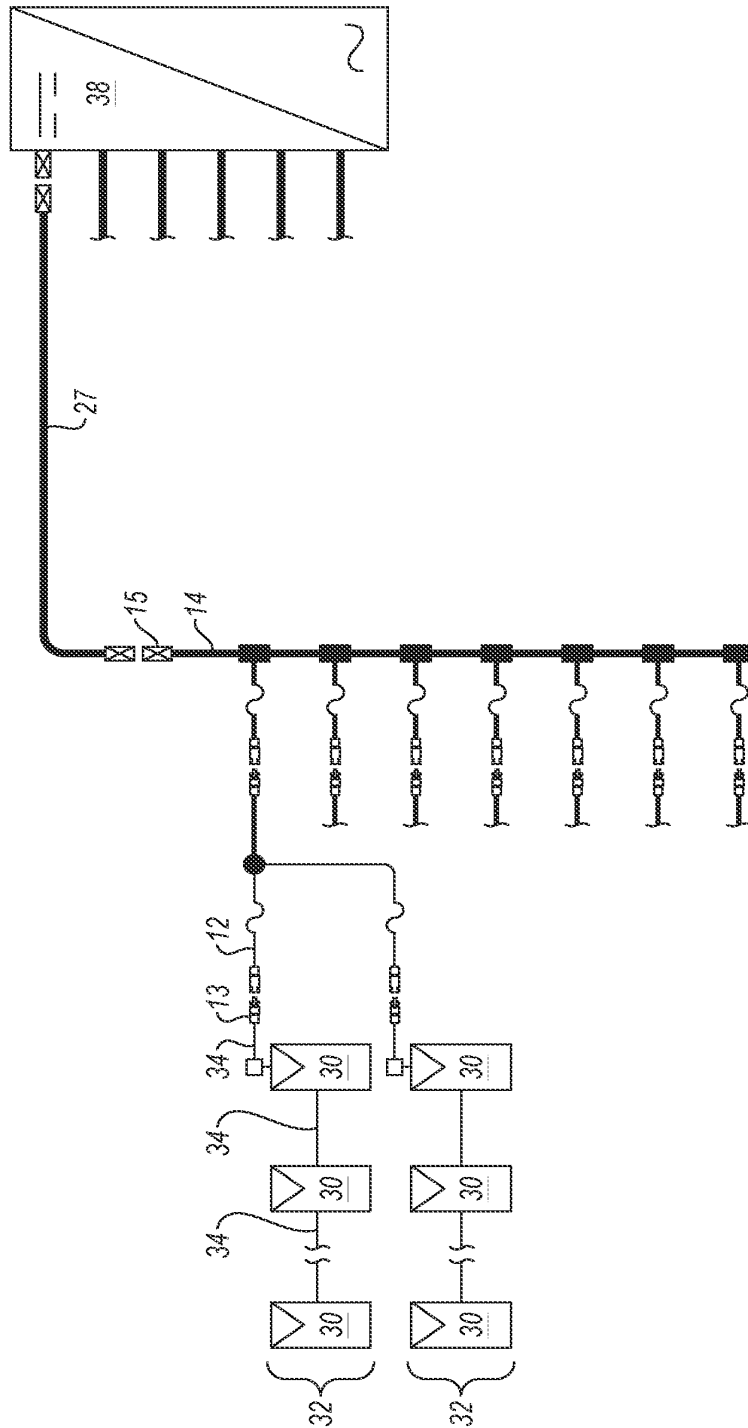


FIG. 9

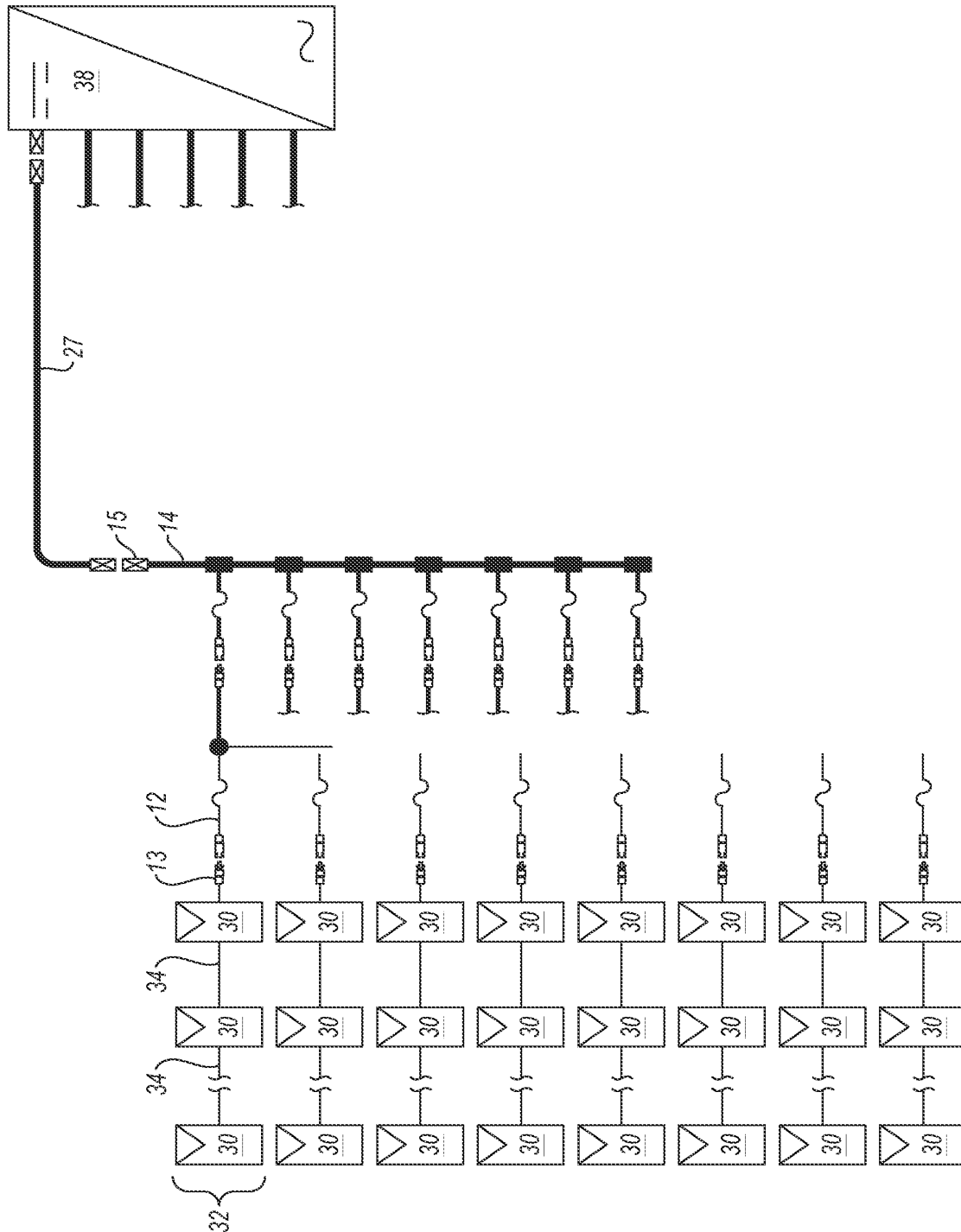
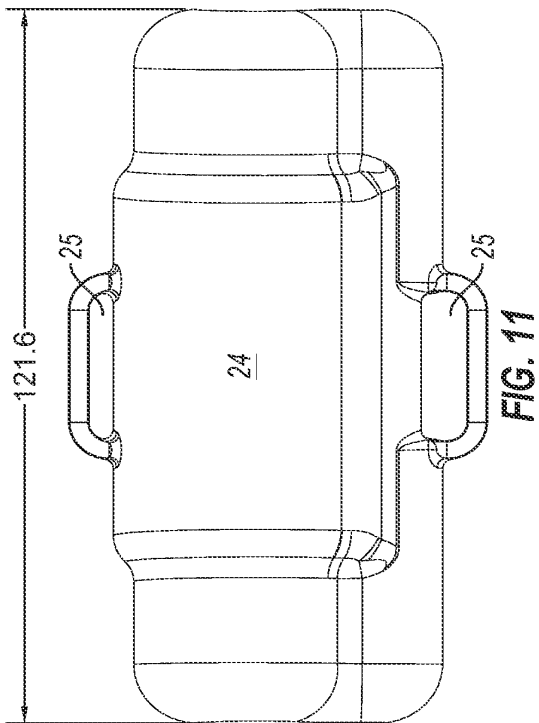
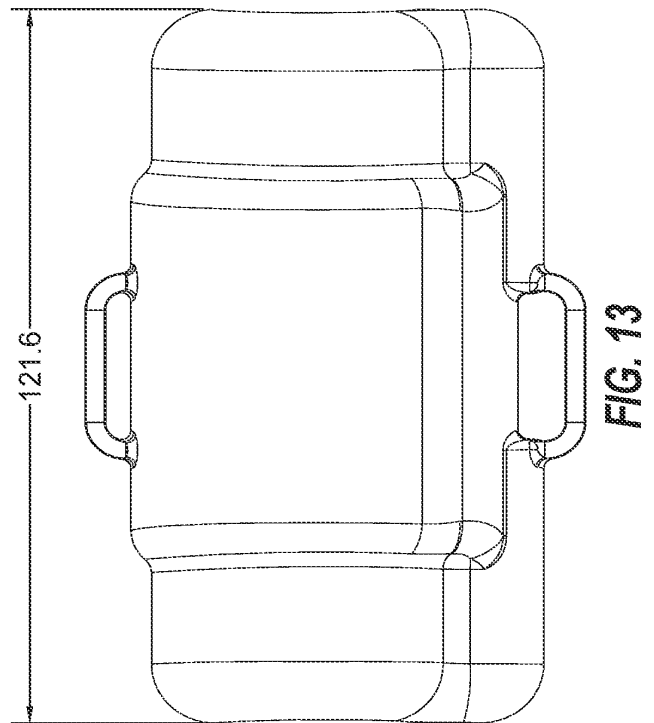
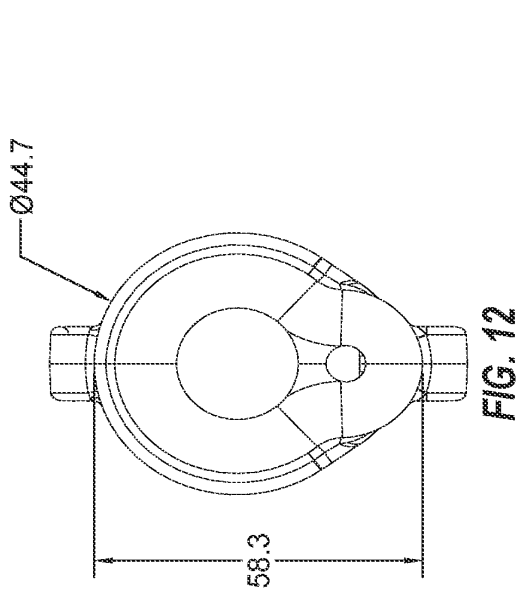
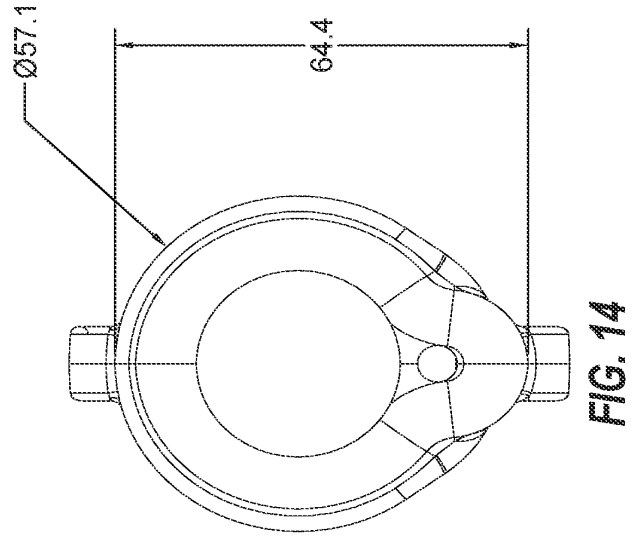


FIG. 10



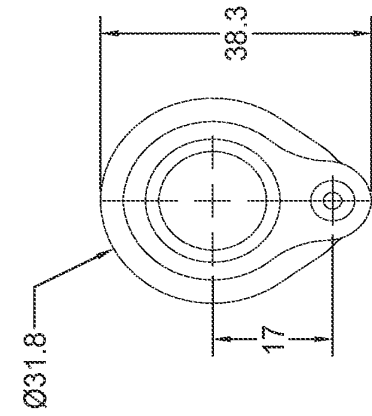


FIG. 16

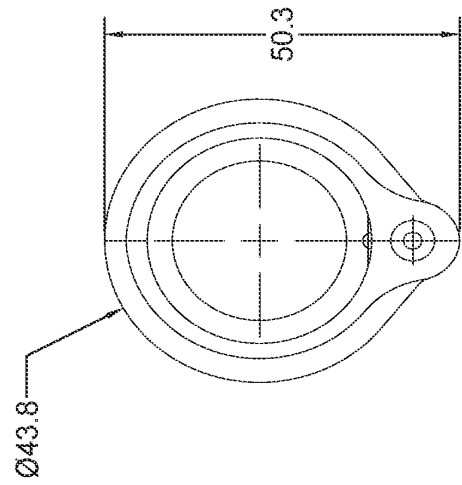


FIG. 18

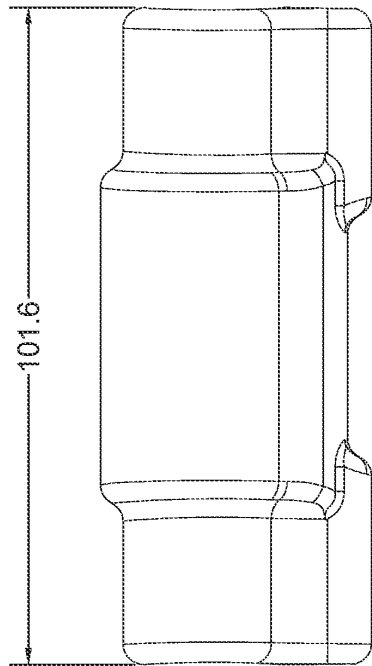


FIG. 15

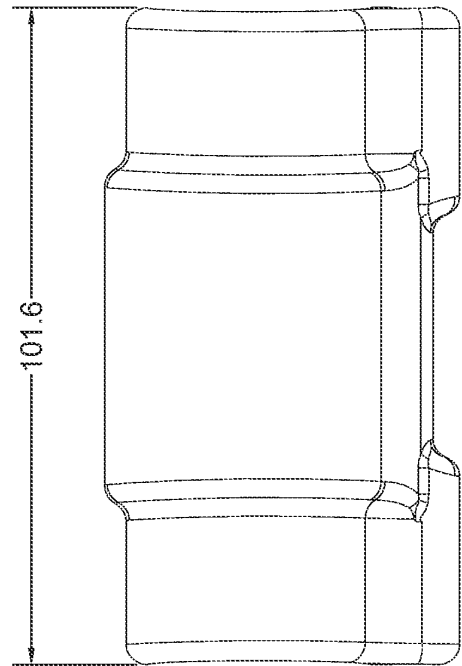


FIG. 17

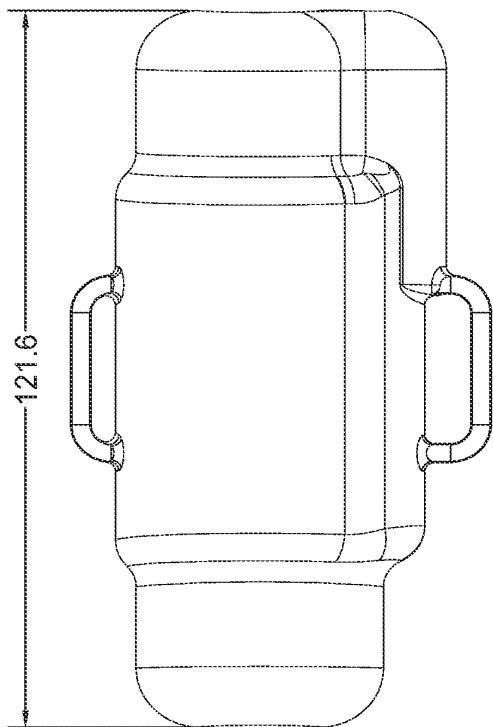


FIG. 19

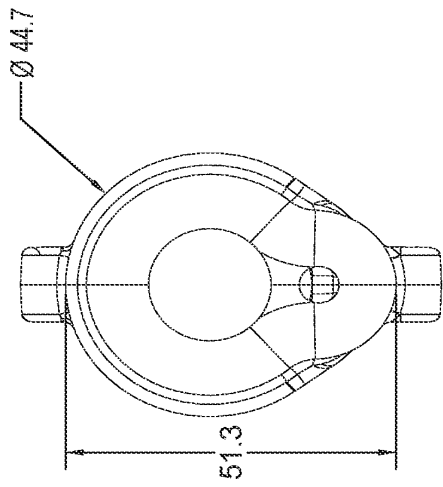


FIG. 20

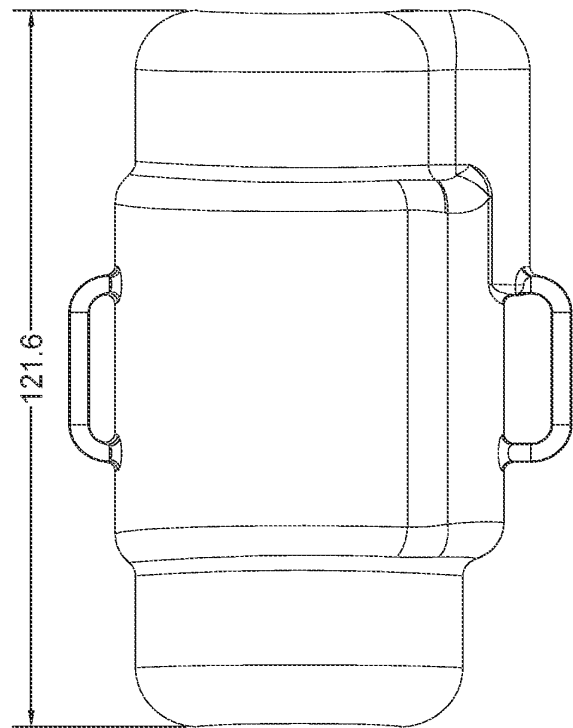


FIG. 21

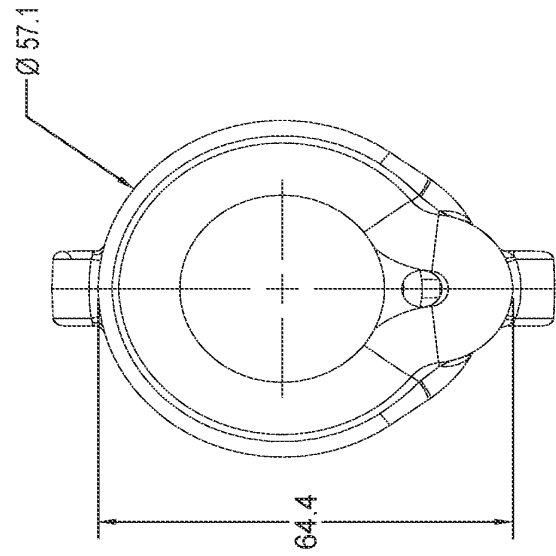


FIG. 22

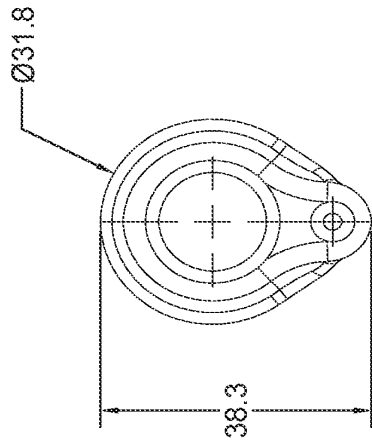


FIG. 24

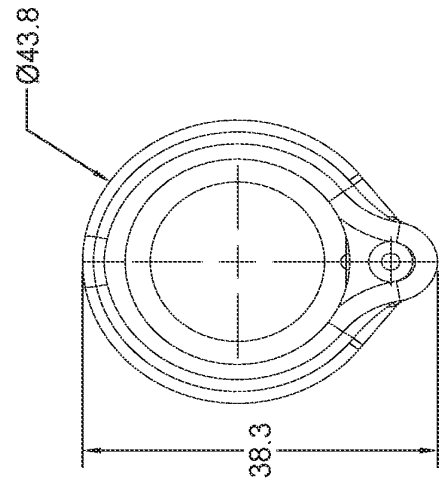


FIG. 26

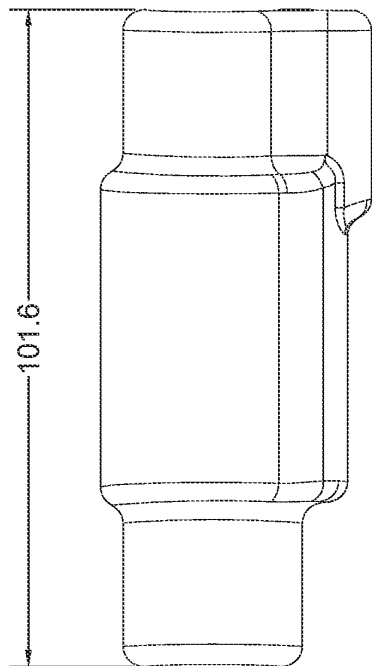


FIG. 23

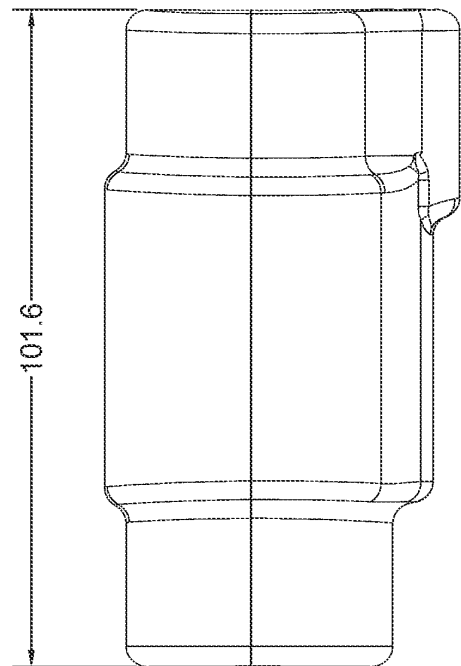


FIG. 25

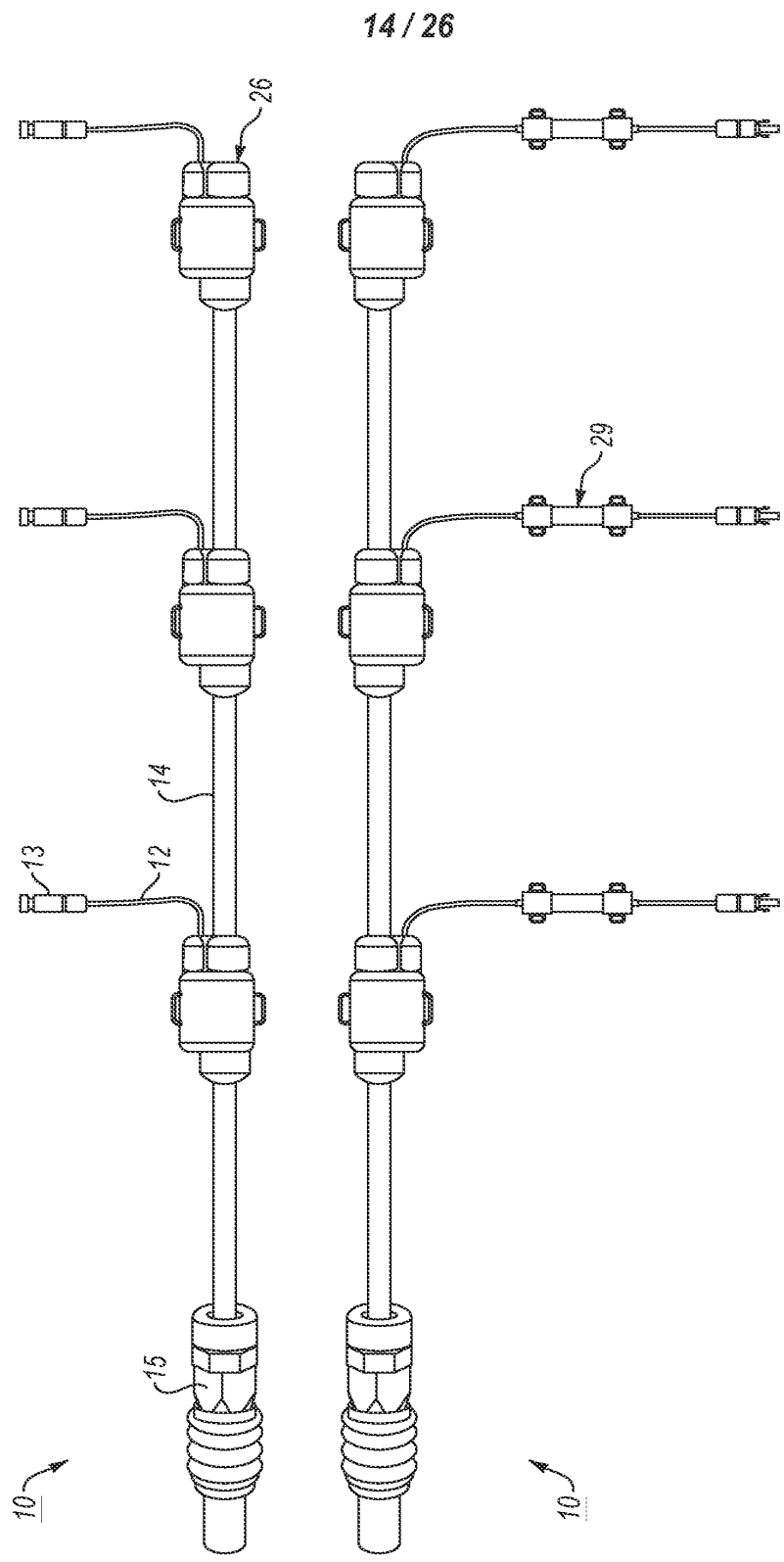


FIG. 27

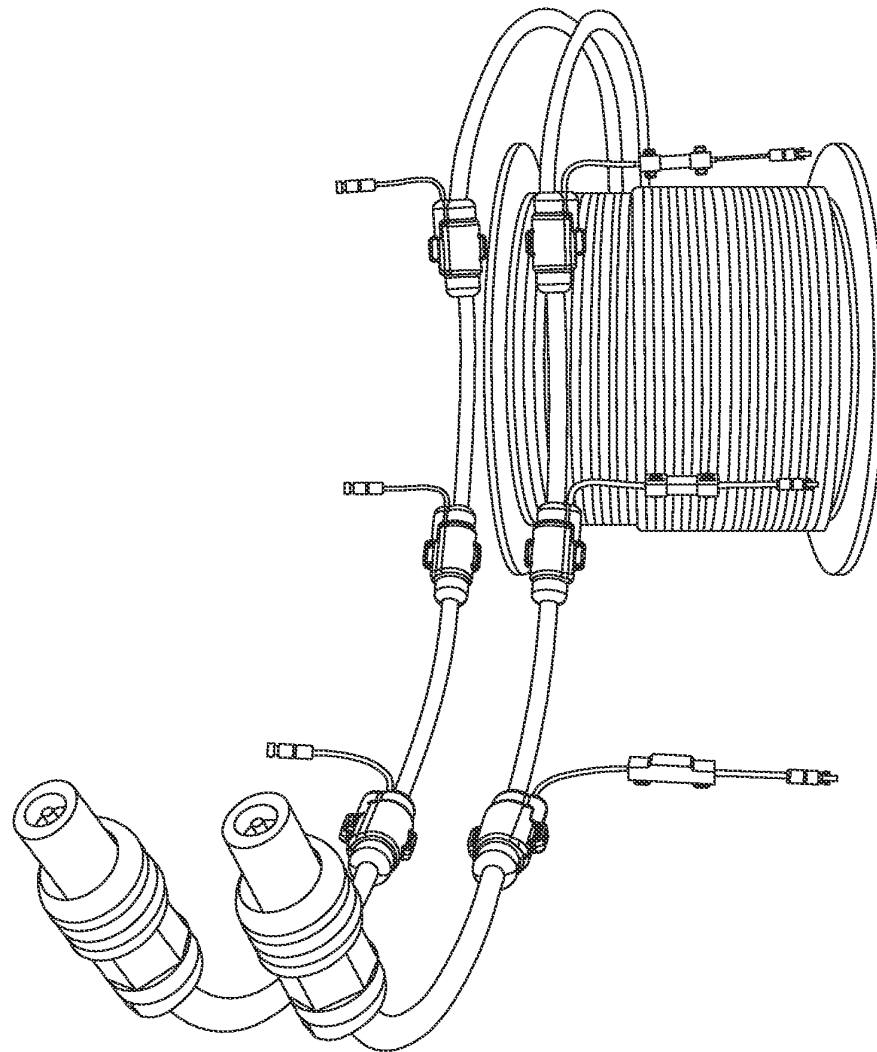


FIG. 28

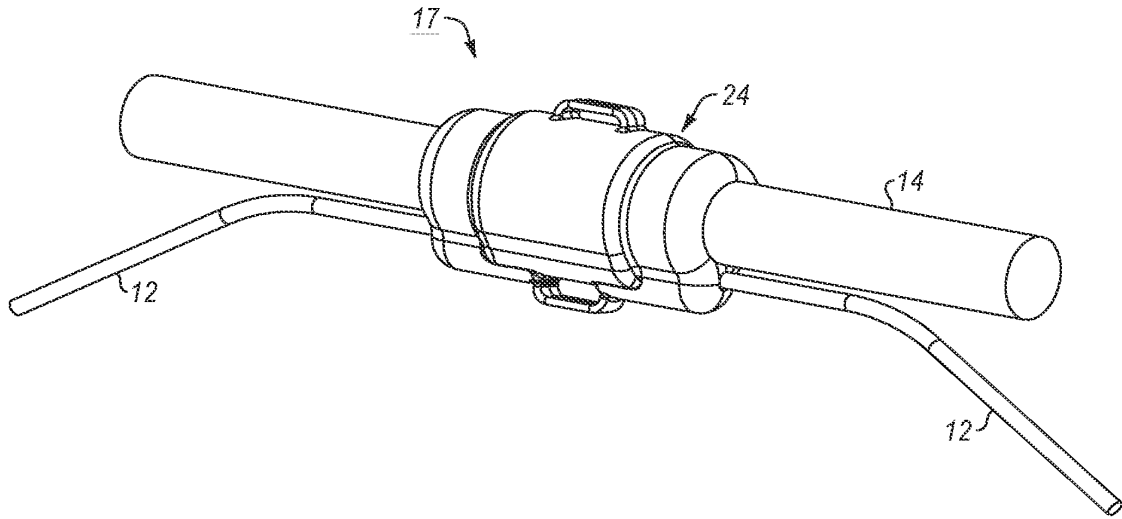


FIG. 29

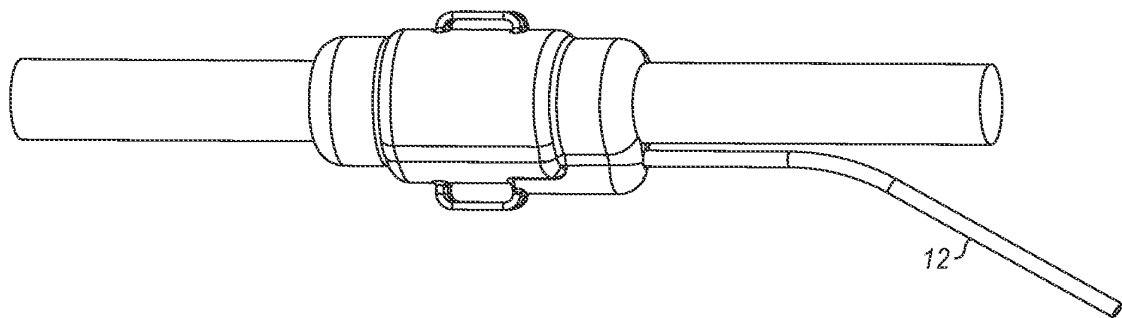


FIG. 30

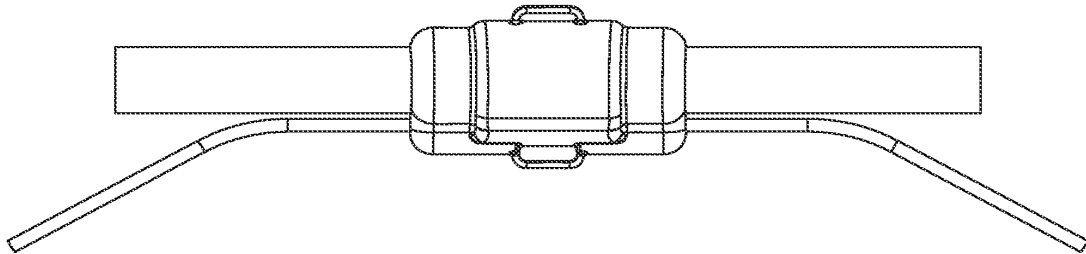


FIG. 31

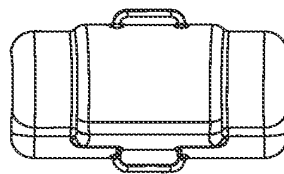


FIG. 32

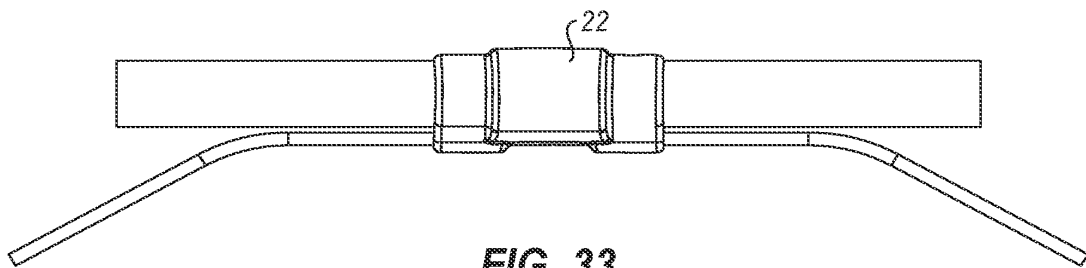


FIG. 33

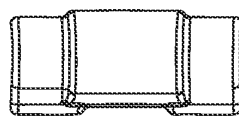


FIG. 34

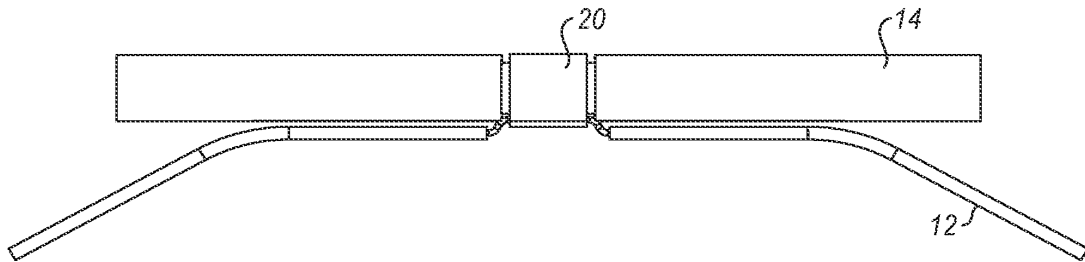


FIG. 35

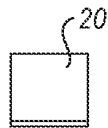


FIG. 36

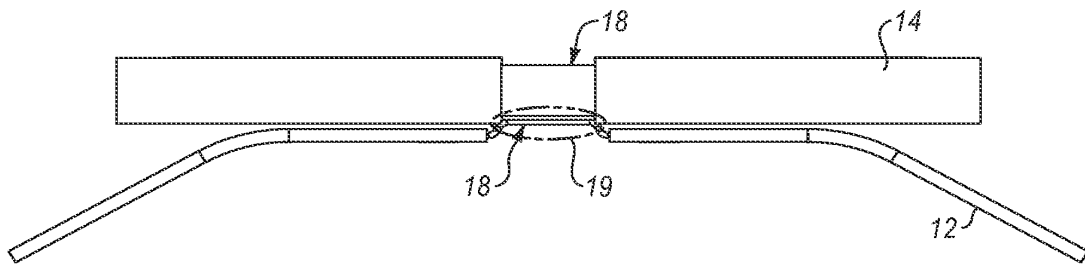


FIG. 37

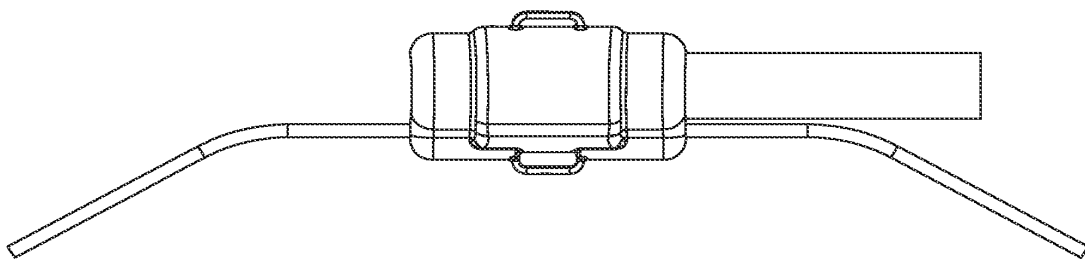


FIG. 38

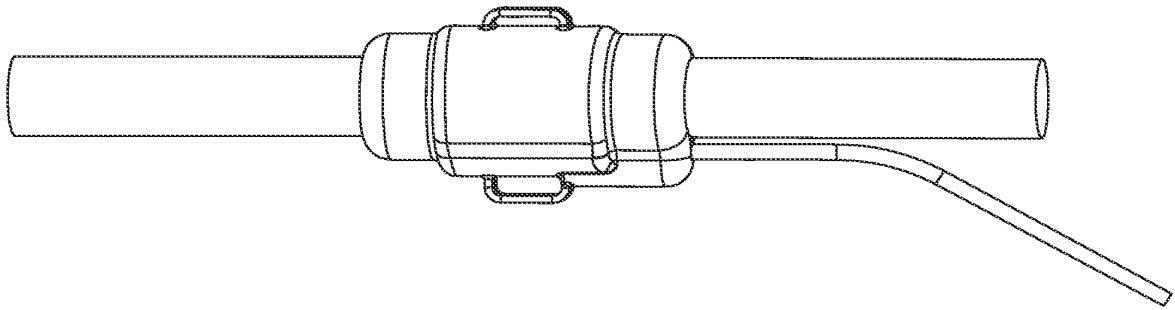


FIG. 39

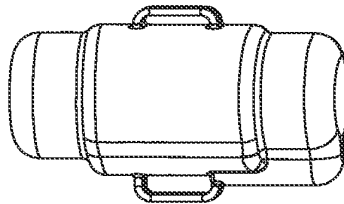


FIG. 40

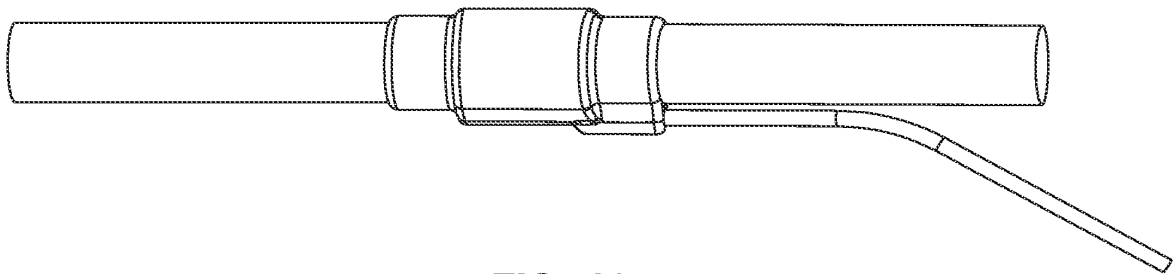


FIG. 41

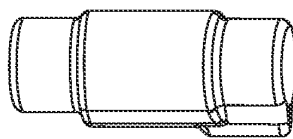


FIG. 42

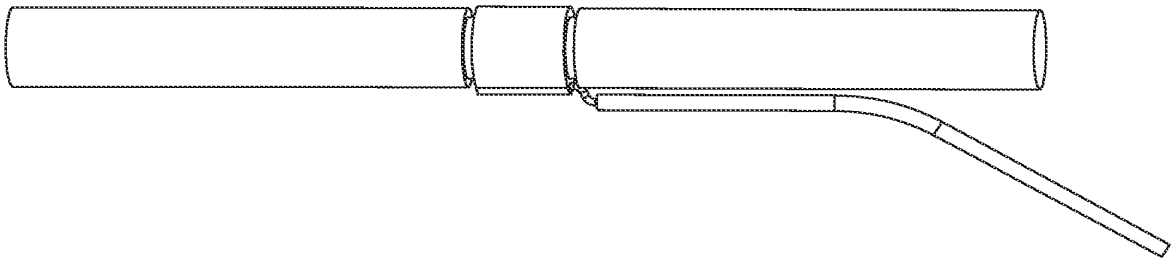


FIG. 43

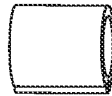


FIG. 44

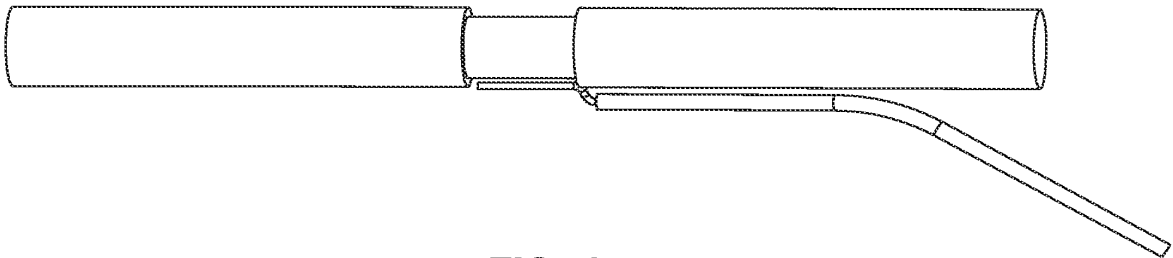


FIG. 45

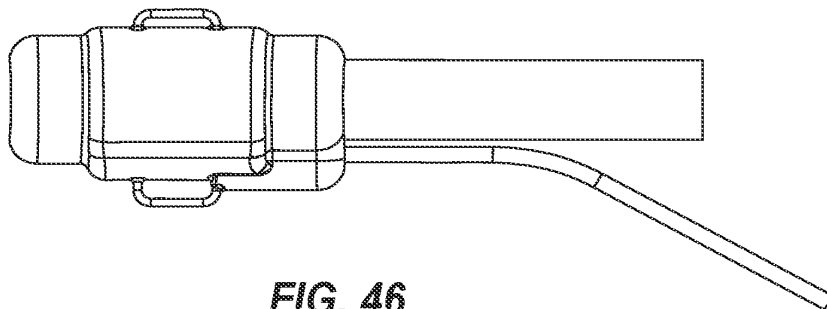


FIG. 46

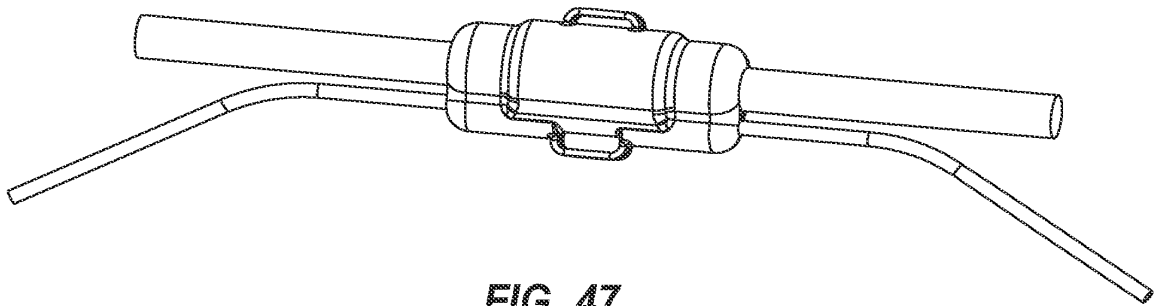


FIG. 47

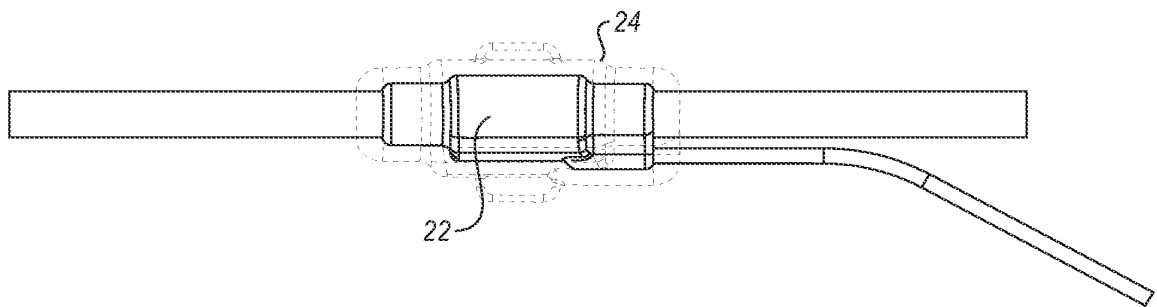


FIG. 48

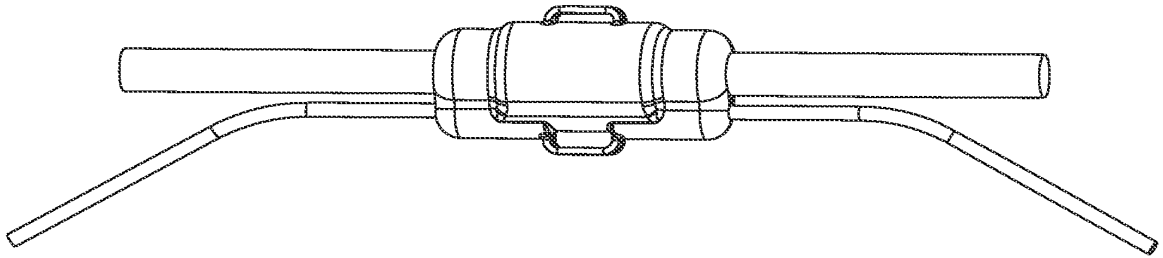


FIG. 49

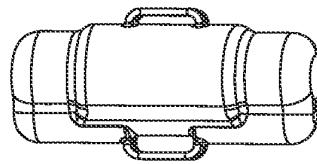


FIG. 50

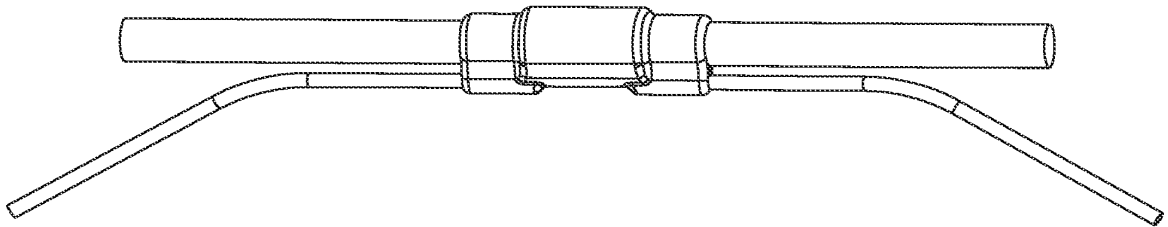


FIG. 51



FIG. 52

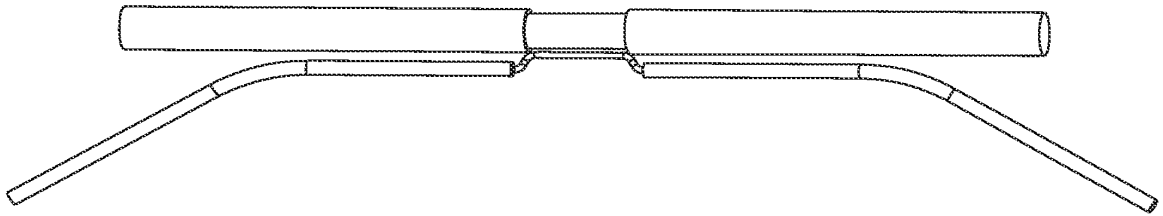


FIG. 53

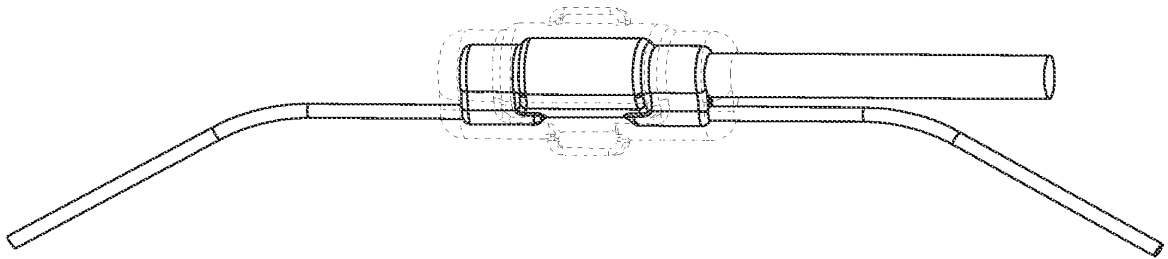


FIG. 54

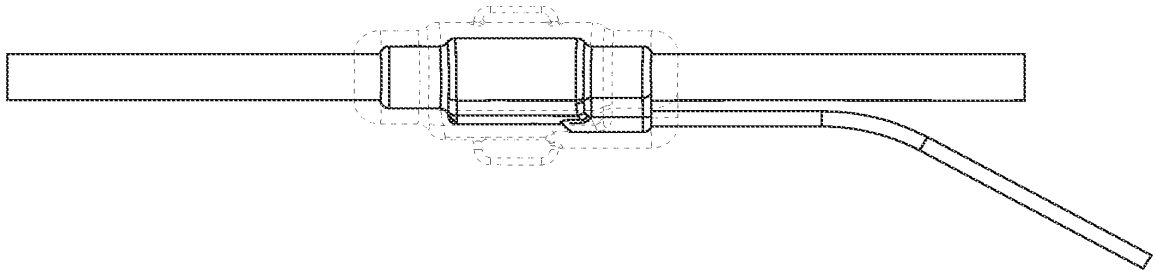


FIG. 55

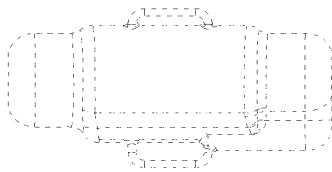


FIG. 56

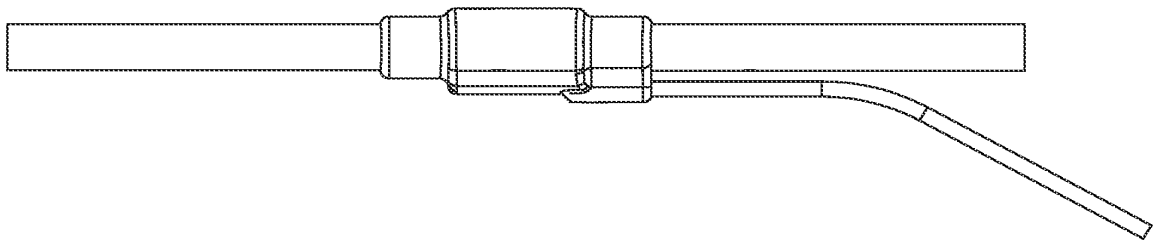


FIG. 57

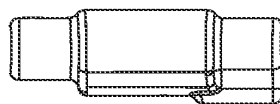


FIG. 58

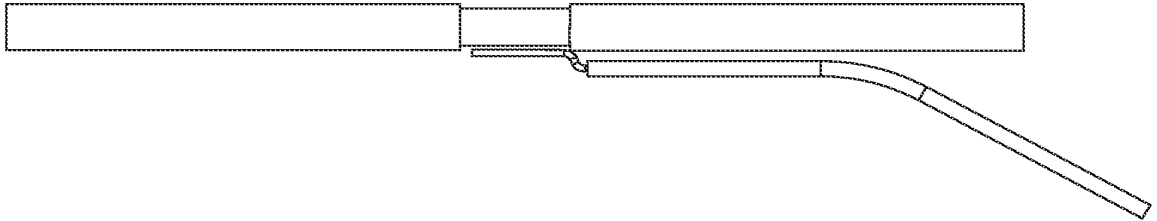


FIG. 59

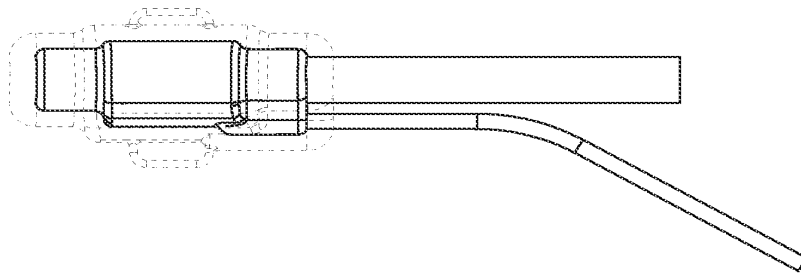


FIG. 60

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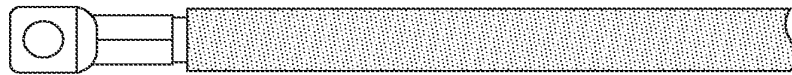


FIG. 61