

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

Assignment ID: PATI1287854

SUBMISSION TYPE:	NEW ASSIGNMENT	
NATURE OF CONVEYANCE:	ASSIGNMENT	
CONVEYING PARTY DATA		
	Name	Execution Date
	Walter Ernest Power II	09/15/2025
	Gregory Alan GODFREY	09/15/2025
	Carl Eugene KOSSUTH III	09/11/2025
RECEIVING PARTY DATA		
Company Name:	Tethrd LLC	
Street Address:	2409 Pulaski Hwy	
City:	Columbia	
State/Country:	TENNESSEE	
Postal Code:	38401	
PROPERTY NUMBERS Total: 7		
Property Type	Number	
Application Number:	19284965	
Application Number:	18671581	
Application Number:	18602822	
Application Number:	17867553	
Application Number:	17231717	
Application Number:	17022844	
Application Number:	16736345	
CORRESPONDENCE DATA		
Fax Number:		
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>		
Phone:	(404)868-2773	
Email:	sgellineau@bradley.com	
Correspondent Name:	Sandy Gellineau	
Address Line 1:	Bradley Arant Boulton Cummings LLP	
Address Line 2:	1230 Peachtree Street NE, Promenade Tower, Ste 2100	
Address Line 4:	Atlanta, GEORGIA 30309	
ATTORNEY DOCKET NUMBER:	305774-401012	
NAME OF SUBMITTER:	Sandy Barthelus Gellineau	

SIGNATURE:	/Sandy Barthelus Gellineau/
DATE SIGNED:	09/17/2025
	This document serves as an Oath/Declaration (37 CFR 1.63).
Total Attachments: 8 source=305774-401011_401012-Assignment fully executed#page1.tiff source=305774-401011_401012-Assignment fully executed#page2.tiff source=305774-401011_401012-Assignment fully executed#page3.tiff source=305774-401011_401012-Assignment fully executed#page4.tiff source=305774-401011_401012-Assignment fully executed#page5.tiff source=305774-401011_401012-Assignment fully executed#page6.tiff source=305774-401011_401012-Assignment fully executed#page7.tiff source=305774-401011_401012-Assignment fully executed#page8.tiff	

ASSIGNMENT

THIS ASSIGNMENT is made by **Walter Ernest POWER, II** residing at Carver, MN, **Gregory Alan GODFREY**, residing at Richmond Hill, GA, and **Carl Eugene KOSSUTH, III**, residing at Rolla, MO (hereinafter referred to as “**Assignors**”).

WHEREAS, Assignors has invented certain new and useful inventions and improvements set forth in applications for Letters Patent of the United States and certain foreign countries, the applications for which are listed on **Exhibit A** which is attached hereto (hereinafter referred to as the “**Applications**”).

WHEREAS, **Tethrd LLC**, a corporation organized under and pursuant to the laws of the State of Delaware, having its principal place of business at **2409 Pulaski Hwy, Columbia, TN 38401** (hereinafter referred to as “**Assignee**”), is desirous of acquiring the entire right, title and interest in and to said inventions and said Application for Letters Patent of the United States, and in and to any Letters Patent of the United States to be obtained therefore and thereon.

NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, Assignors have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto Assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions and Application, and in and to any and all direct and indirect divisions, non-provisional applications, continuations and continuations-in-part of said Application, and any and all Letters Patent in the United States and all foreign countries which may be granted therefor and thereon, and reissues, reexaminations and extensions of said Letters Patent, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by Assignee, for its own use and benefit and the use and benefit of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent may be granted and/or extended, as fully and entirely as the same would have been held and enjoyed by Assignors, had this sale and assignment not been made.

AND for the same consideration, Assignors hereby represent and warrant to Assignee, its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, except for any rights, titles and/or interests that have arisen to Assignee under law or that have already been transferred to Assignee, Assignors are the sole and lawful owners of the entire right, title and interest in and to the said inventions and Application, and that the same are unencumbered and that Assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, Assignors hereby covenant and agree to and with Assignee, its successors, legal representatives and assigns, that Assignors will sign all papers and documents, take all lawful oaths and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of the Application and any Letters Patent issuing therefrom for said inventions, without charge to Assignee, its successors, legal representatives and assigns, whenever counsel of Assignee, or counsel of its successors, legal representatives and assigns, shall advise: that any proceeding in connection with said inventions, or said Application, or any proceeding in connection with any Letters Patent or applications for Letters Patent for said inventions in any country, including but not limited to interference proceedings, is lawful and desirable; or, that any division, continuation or continuation-in-part of the Application, or any reissue, reexamination or extension of any Letters Patent, to be obtained thereon, is lawful and desirable.

AND Assignors warrant and represent that the Assignors individually are not aware of any information that is material to patentability of the above-mentioned inventions, namely, any information that, alone or in combination with other information, establishes on its face the unpatentability of the inventions or is inconsistent with arguments of patentability made to the U.S. Patent & Trademark Office. Material information may include devices, products, publications, and so forth, that are similar to the present inventions, and/or any public disclosure, commercial use, or offer for sale more than one year prior to the filing date of the Application.

AND Assignors hereby request the Commissioner of Patent and Trademarks to issue said Letters Patent of the United States to Assignee, as Assignee of said inventions and the

Letters Patent to be issued thereon, for the sole use and benefit of Assignee, its successors, legal representatives and assigns.

AND Assignors hereby grant the following individuals the power to insert on this Assignment any further identification which may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document:

BRADLEY ARANT BOULT CUMMINGS LLP

All practitioners at Customer Number 24728

[Signatures are on following pages.]

IN TESTIMONY WHEREOF, I have hereunto set my hand this _____ day of

9/1 52025 | 2:26 PM CDT, 2025.

Walter Ernest Power, II

Walter Ernest POWER, II

IN TESTIMONY WHEREOF, I have hereunto set my hand this _____ day of

9/15/2025 | 6:53 AM PDT, 2025.



Gregory Alan GODFREY

IN TESTIMONY WHEREOF, I have hereunto set my hand this _____ day of

9/11/2025 | 12:19 PM CDT, 2025.

Carl Eugene Kossuth, III

Carl Eugene KOSSUTH, III

ASSIGNEE:
_____ day of _____, 2025 9/15/2025 | 2:26 PM CDT

Walter Ernest Power, II

Name: Walter Ernest Power, II

Title: CTO

Tethrd LLC

EXHIBIT A**Patents**

<u>TITLE</u>	<u>APPLICATION NO./ PATENT NO. JURISDICTION</u>	<u>FILING DATE ISSUE DATE</u>	<u>STATUS</u>
BRIDGE ROPE ASSEMBLY	19/284,965 N/A U.S.	July 30, 2025 N/A	PENDING
BRIDGE ROPE ASSEMBLY	18/671,581 N/A U.S.	May 22, 2024 N/A	PENDING
BRIDGE ROPE ASSEMBLY	18/602,822 N/A U.S.	March 12, 2024 N/A	PENDING
BRIDGE ROPE ASSEMBLY	17/867,553 11,964,175 U.S.	July 18, 2022 April 23, 2024	ISSUED
BRIDGE ROPE ASSEMBLY	17/231,717 11,504,556 U.S.	April 15, 2021 November 22, 2022	ISSUED
BRIDGE ROPE ASSEMBLY	17/022,844 N/A U.S.	September 16, 2020 N/A	ABANDONED
BRIDGE ROPE ASSEMBLY	16/736,345 N/A U.S.	January 7, 2020 N/A	ABANDONED



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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18/671,581

05/22/2024

Walter Ernest Power II

TETH143.03

5913

44088 7590 08/28/2025
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

EXAMINER

MC FARLAND, KATHLEEN MAVOURNEEN

ART UNIT	PAPER NUMBER
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3635

NOTIFICATION DATE	DELIVERY MODE
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08/28/2025

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):

jason@kaufholdlaw.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.

Acknowledgment is made of the amendment filed December 10, 2024. The application has been updated accordingly.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis (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 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.

Claims 1-9 and 12-17 are rejected under 35 U.S.C. 103 as being unpatentable over **Jones (2008/0000719)** in view of **Paulson (5,699,657)**.

Jones discloses:

Claim 1: A bridge rope assembly (**Fig. 1; 10**) configured to couple together a tree rope to a first bridge loop (**Fig. 4; see detail**) and a second bridge loop (**Fig. 4; see detail**) on a harness (**Fig. 4; 18**), the bridge rope assembly including:

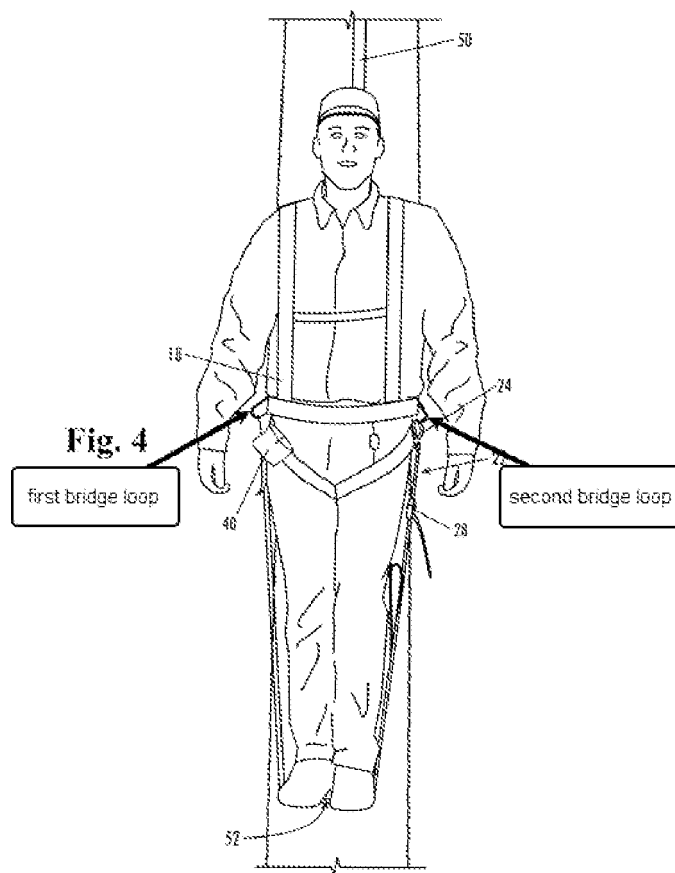
a main body (**Fig. 1; 12**) comprising a rope (**Fig. 1; 12, Para. [0018]**) having a first end (**Fig. 1; see detail**) and a second end (**Fig. 1; see detail**), the main body having an eye loop (**Fig. 1; 16**) in the main body, the eye loop being configured to permanently or releasably engage with the first bridge loop (**Fig. 4; Para. [0023]**) to permanently or releasably secure the main body to the first bridge loop (**Fig. 4; Para. [0018]**), the main body comprising a first portion (**Fig. 1; see detail**) including the first end and a second portion (**Fig. 1; see detail**) including the second end (**Fig. 1; see detail**); and

a friction hitch (**Fig. 1; 28**) being positioned on the main body between the second end and the eye loop (**Fig. 1; see detail**), the friction hitch being configured to permanently or releasably engage (**Fig. 1; via 24**) with the second bridge loop to permanently or releasably secure the friction hitch to the second bridge loop, the friction hitch comprising a closed loop (**Fig. 2A; 26**).

Jones fails to disclose the eye loop being formed by a splice where the first portion extends through the second portion of the main body such that the first end is positioned within the second portion adjacent to the second end.

However, **Paulson** discloses forming an eye loop (**Fig. 10; 28**) by a splice (**Fig. 10; 10**) where the first portion (**Fig. 10; nearest 44**) extends through the second portion (**Fig. 10; nearest 40**) and the first end (**Fig. 10; 22**) is positioned within the second portion adjacent the second end (**Fig. 10; 20**).

Thus, in combination Jones and Paulson disclose the bridge rope assembly, of Jones, where the eye loop is formed by the splice, of Paulson.



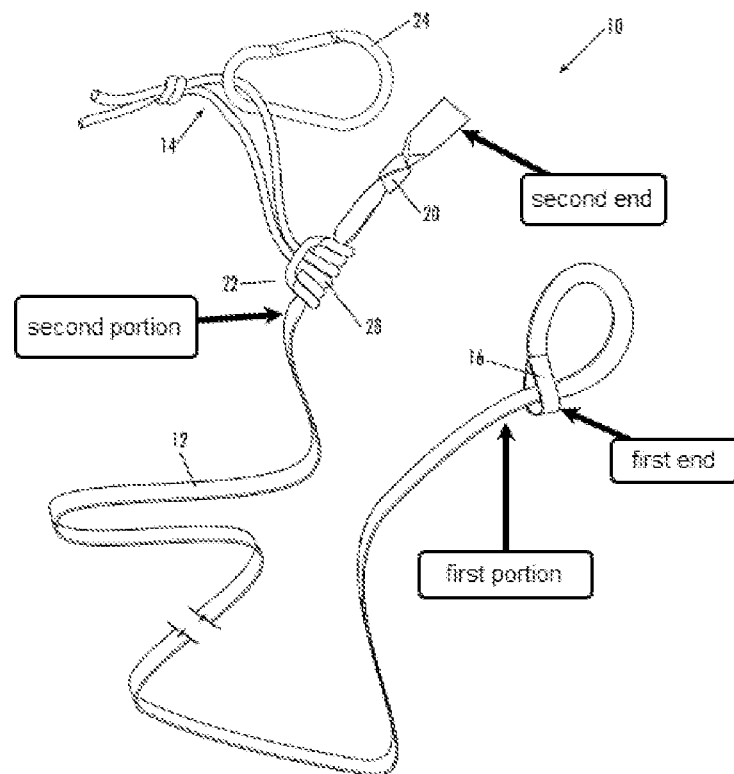


Fig. 1

Claim 2: Jones discloses the bridge rope assembly according to claim 1, wherein the rope has a length from the first end to the second end between 72.0 inches and 126.0 inches (Para. [0018]).

Claim 3: Jones and Paulson disclose the bridge rope assembly according to claim 1, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches (Jones and Paulson fail to expressly disclose a distance of 24 to 40 inches; however, they do disclose an eye loop that can be expanded and contracted therefore the distance of the eye

loop from the second end can be varied and, as such, be located between 24 and 40 inches from the second end, therefore the prior art is capable of meeting the claim limitation).

Claim 4: Jones discloses the bridge rope assembly according to claim 3, wherein the main body includes a stop knot (**Fig. 1; 20**) in the second portion adjacent to the second end (**Fig. 1; see detail**).

Claim 5: Jones and Paulson disclose the bridge rope assembly according to claim 4, further including a securing member (**Paulson - Fig. 10; 40**) being positioned on the main body at a juncture of the first and second ends (**Fig. 10; combined at 40**) to retain the first and second ends at a static position relative to each other (**Fig. 10; held in position at 40**).

Claim 6: Jones discloses the bridge rope assembly according to claim 4, wherein the closed loop comprises a single rope being formed into the closed loop (**Fig. 2A; 26 is depicted as a single rope**).

Claim 7: Jones discloses the bridge rope assembly according to claim 6, but fails to disclose wherein the single rope of the closed loop has a length between 40.0 inches and 60.0 inches.

While **Jones** fails to disclose the single rope of the closed loop having a length between 40 and 60 inches, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use a longer length of rope for the closed loop, since it has been held that, “where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.” The examiner contends that a longer

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segment of rope would not perform differently than that of the length recited by Jones, since it would not change the purpose or function of the friction hitch. **See MPEP 2144.04(IV)(A) – Changes in Size.**

Claims 8, 9 and 13: Jones discloses the bridge rope assembly according to claims 1, 7 and 12, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches (**Para. [0019]**).

Claim 12: Jones and Paulson disclose the bridge rope assembly according to claim 9, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches (**Jones and Paulson fail to expressly disclose a distance of 24 to 40 inches; however, they do disclose an eye loop that can be expanded and contracted therefore the distance of the eye loop from the second end can be varied and, as such, be located between 24 and 40 inches from the second end, therefore the prior art is capable of meeting the claim limitation**).

Claim 14: Jones and Paulson disclose the bridge rope assembly according to claim 12, wherein a distance between the first and second ends is less than 2.0 inches (**Jones and Paulson fail to expressly disclose a distance between the first and second ends of less than 2 inches; however, Paulson depicts in Fig. 10 first and second ends (ends of 20 and 22) that are in close proximity to one another. Paulson discusses an example rope of 5/8 inch thickness, with that thickness in mind the scale would determine that the distance between the ends is less than 2 inches, therefore the prior art is capable of meeting the claim limitation**).

Claim 15: Jones and Paulson disclose a method of installing the bridge rope assembly on a harness according to claim 1, comprising the steps of:

releasably engaging the eye loop (**Jones/Paulson - Fig. 1; 16**) with the first bridge loop (**Fig. 4; see detail**) of the harness (**Fig. 4; 18**); and releasably engaging the friction hitch (**Fig. 1; 28**) with the second bridge loop (**Fig. 4; see detail**) of the harness.

Claim 16: Jones and Paulson disclose the method of claim 15, wherein the step of releasably engaging the eye loop with the first bridge loop comprises inserting the second end of the rope through the first bridge loop and through the eye loop and forming a releasable knot with the eye loop wrapped around the first bridge loop (**Fig. 1; 16, Para. [0018]**).

Claim 17: Jones and Paulson disclose the method of claim 15, wherein the step of releasably engaging the friction hitch with the second bridge loop comprises inserting a portion of the closed loop (**Fig. 2A; via 24**) through the second bridge loop (**Fig. 4; see detail**) and forming a releasable knot (**Fig. 1; nearest 14**) with the portion of the closed loop wrapped around the second bridge loop.

Claims 10-11 are rejected under 35 U.S.C. 103 as being unpatentable over **Jones (2008/0000719)** in view of **Paulson (5,699,657)** and further in view of **De Sousa Faria (2019/0301089)**.

Claims 10 and 11: Jones discloses the bridge rope assembly according to claims 1 and 9, but fails to disclose wherein the main body and the friction hitch each are comprised of UHMWPE.

However, **De Sousa Faria** discloses a rope comprised of UHMWPE (**Fig. 1; Para. [0016]**).

Therefore, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention to modify the main body and friction hitch ropes of

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Jones to be manufactured of UHMWPE, as taught by **De Sousa Faria**, with a reasonable expectation of success because it would provide a rope with high tenacities, low stretch and low elongation at break (Para. [0015]).

Response to Arguments

Applicant's arguments filed December 10, 2024 have been fully considered but they are not persuasive.

Applicant's arguments rely on language solely recited in preamble recitations in independent claim 1. When reading the preamble in the context of the entire claim, the recitation of "a bridge rope assembly configured to couple together a tree rope to a first bridge loop and a second bridge loop on a harness" is not limiting because the body of the claim describes a complete invention and the language recited solely in the preamble does not provide any distinct definition of any of the claimed invention's limitations. Thus, the preamble of the claim(s) is not considered a limitation and is of no significance to claim construction. See *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See MPEP § 2111.02.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of

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the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any nonprovisional extension fee (37 CFR 1.17(a)) pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen M. McFarland whose telephone number is (571)272-9139. The examiner can normally be reached Monday-Friday 8:00am-4:00pm.

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, Brian Mattei can be reached at (571) 270-3238. 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

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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.

/Kathleen M. McFarland/

Examiner, Art Unit 3635

Kathleen M. McFarland

Examiner

Art Unit 3635

/BRIAN D MATTEI/

Supervisory Patent Examiner, Art Unit 3635

Search Notes 	Application/Control No. 18/671,581	Applicant(s)/Patent Under Reexamination Power et al.
	Examiner Kathleen M McFarland	Art Unit 3635

CPC - Searched*		
Symbol	Date	Examiner
A62B35/0037; B35/0075; B35/0025; B35/0031; B35/0012	08/06/2024	KMM
A01M31/02	08/06/2024	KMM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
PE2E search, CPC group search, text search and inventor search	08/06/2024	KMM
Reviewed previously tagged references	08/21/2025	KMM

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

	/Kathleen M. McFarland/ Examiner, Art Unit 3635
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Doc code: IDS

PTO/SB/08a (03-15)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2016. OMB 0651-0031

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Walter Ernest Power II	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	TETH143.03	

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	8061479		2011-11-22	Harris Jr.	
	2	8292028		2012-10-23	Wise	
	3	8356691		2013-01-22	Griffith	
	4	8584799		2013-11-19	Dennington	
	5	9320925		2016-04-26	Wise	
	6	9808659		2017-11-07	Chevalier	
	7	10258814		2019-04-16	Casebolt	
	8	11504556		2022-11-22	Power II	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

	9	11964175		2024-04-23	Power II	
	10	5699657		1997-12-23	Paulson	
	11	11771931		2023-10-03	Leach	
	12	8333262		2012-12-18	Carpenter	
	13	7063185		2006-06-20	Green	
	14	7909137		2011-03-22	Green	
	15	3757893		1973-09-11	Hobbs	
	16	4508193		1985-04-02	Forrest	
	17	2252998		1941-08-19	Wachtel	
	18	4962929		1990-10-16	Melton Jr.	
	19	6712181		2004-03-30	Nichols	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

	20	5010850		1991-04-30	Sailer	
	21	4347914		1982-09-07	Gary	
	22	11534633		2022-12-27	Cowell	
	23	5901632		1999-05-11	Ryan	
	24	5970697		1999-10-26	Jacobs	
	25	2600395		1952-06-17	Joseph	
	26	7107749		2006-09-19	Wetzels	
	27	5699657		1997-12-23	Paulson	
	28	11850452		2023-12-26	Power II	
	29	11351405		2022-06-07	Power II	
	30	9003579		2015-04-14	Pinholster Jr.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

	31	10918194		2021-02-16	Conlin	
	32	11511141		2022-11-29	Kim	

If you wish to add additional U.S. Patent citation information please click the Add button.

Add

U.S.PATENT APPLICATION PUBLICATIONS

Remove

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080179136		2008-07-31	Griffith	
	2	20090255756		2009-10-15	Green	
	3	20080000719		2008-01-03	Jones	
	4	20190301089		2019-10-03	DE SOUSA	
	5	20210101032		2021-04-08	Power II	
	6	20230173312		2023-06-08	Gregoire, Jr.	
	7	20220249886		2022-08-11	Leach	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

8	20050139419		2005-06-30	Green	
9	20210038929		2021-02-11	Vitt	
10	20170291047		2017-10-12	Bouquier	
11	20120393998		2021-12-23	Cowell	
12	20180154196		2018-06-07	Cowell	
13	20190210696		2019-07-11	Barnes	
14	20020104711		2002-08-08	Nichols	
15	20200039808		2020-12-20	Power II	
16	20060207828		2006-09-21	D'Acquisto	
17	20080000719		2008-01-03	Jones	
18	20100162882		2010-07-01	Shakespeare	

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STATEMENT BY APPLICANT
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Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

	19	20190134438		2019-05-09	Liggett	
	20	20190210696		2019-07-11	Barnes	
	21	20210076666		2021-03-18	Power II	
	22	20220249886		2022-08-11	Leach	
	23	20220241624		2022-08-04	Jarusiewicz	
	24	20230094095		2023-03-30	Armstrong	
	25	20240352671		2024-10-24	Heins	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	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	WO2018111624	WO		2018-06-21	Jacob		☐
	2	WO2018051068	WO		2018-03-22	Griffith		☐

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

	3	EP1932565	EP		2008-06-18	Dussenne		☐
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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		☐

If you wish to add additional non-patent literature document citation information please click the Add button **EXAMINER SIGNATURE**

Examiner Signature	/Kathleen M. McFarland/	Date Considered	08/19/2025
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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		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

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	/brendandix/	Date (YYYY-MM-DD)	2025-07-30
Name/Print	Brendan B. Dix	Registration Number	37,313

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 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.
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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.

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	96	((("POWER") near3 ("Walter")) OR ((("GODFREY") near3 ("Gregory")) OR ((("KOSSUTH") near3 ("Carl")) OR ((("CHADWICK") near3 ("Shawn"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/07/18 06:21 PM
L2	12	("10258814" "11504556" "20080179136" "20090255756" "8061479" "8292028" "8356691" "8584799" "9320925" "9808659").PN.	(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))	OR	ON	ON	2024/07/18 06:23 PM
L3	403	(A62B35/0012).cpc.	(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))	OR	ON	ON	2024/07/18 06:27 PM
L4	2662	(A62B35/0037 OR A62B35/0075).cpc.	(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))	OR	ON	ON	2024/07/18 06:28 PM
L5	37	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2024/07/19

L6	34	More like doc: US-20230173312-A1	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	10:31 AM
		Text: (US-12011623-B1 OR US-20230248135-A1 OR US-20130068556-A1 OR EP-3512609-A1 OR WO-2018051068-A1 OR US-20210228923-A1 OR US-11964175-B2 OR US-11504556-B2 OR US-20220347501-A1 OR EP-3512609-B1 OR US-4396091-A OR US-20120012421-A1 OR WO-8910160-A1 OR EP-0411011-B1 OR US-5050704-A OR US-20130319793-A1 OR FI-90016-B OR DK-166067-B OR US-4315655-A OR US-7090050-B1).did.					
L7	36	(Artificial Intelligence) More like doc: US-20210228923-A1	(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	2024/07/19 10:32 AM
		Text: (US-11504556-B2 OR US-11964175-B2 OR US-20220347501-A1 OR US-20240216723-A1 OR US-20200398087-A1 OR US-11351405-B2 OR US-20210101032-A1 OR US-11623109-B2 OR US-10604892-B1 OR JP-6606540-B2 OR US-11511141-B2 OR US-20220080234-A1 OR US-20220249886-A1 OR US-11850474-B2 OR US-11771931-B2 OR US-20220126171-A1 OR AU-2015233538-B2 OR AU-2015233538-A1 OR US-8136438-B2 OR US-20210086873-A1).did.					
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		Text: (US-11623109-B2 OR US-11351405-B2 OR					

L8	36	<p>US-20220266072-A1 OR US-20200398087-A1 OR US-12011623-B1 OR US-20210178200-A1 OR US-11850452-B2 OR US-8322488-B2 OR US-7909137-B2 OR US-20120018248-A1 OR US-20190269948-A1 OR US-20220249886-A1 OR US-20210228923-A1 OR US-20220347501-A1 OR EP-3551297-B1 OR US-5228412-A OR US-6390234-B1 OR US-9808659-B2 OR US-20150231422-A1 OR US-5067585-A).did.</p> <p>(Artificial Intelligence) More like doc: US-20200398087-A1</p> <p>Text: (US-11351405-B2 OR US-20200398088-A1 OR US-20210101032-A1 OR US-11623109-B2 OR US-20200324153-A1 OR US-20220266072-A1 OR US-12011623-B1 OR US-20190269948-A1 OR AU-2017245405-A1 OR US-20210178201-A1 OR US-11179584-B2 OR US-11850452-B2 OR US-20210178200-A1 OR US-20210023400-A1 OR FR-3067942-B1 OR ES-2784734-T3 OR FR-3067942-A1 OR US-11771931-B2 OR US-20220249886-A1 OR EP-3421101-A1).did.</p>	<p>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	2024/07/19 10:35 AM
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L10	48	("1903081" "2254179" "3757893" "4318502" "4347914" "4396091" "4399595" "4687074" "5010850" "6364412" "6378174" "6854801" "7051836" "7063185" "7178185" "7455593" "7909137" "8322488" "8661720" "9162091" "9210978" "10016633" "10159858" "11122844" "11179584" "11351405" "20050139419" "20050192159" "20100200329" "20150231422" "20170291047" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20200398088" "20210023400" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999").pn. OR ("11771931").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/19 10:38 AM
L11	36	(Artificial Intelligence) More like doc: US-11771931-B2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2024/07/19 10:38 AM

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L12	26	("1636459" "3448826" "3757893" "4446943" "4687074" "4991689" "5136724" "5183007" "6128782" "6213365" "6223854").pn. OR ("7063185").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/19 11:09 AM
L13	33	(Artificial Intelligence) More like doc: US-7063185-B2 Text: (US-20050139419-A1 OR US-20040154863- A1 OR CA-2432773-A1 OR US-7051836-B2 OR US-20060169534-A1 OR CA-2527459-A1 OR US-8322488-B2 OR US-20120018248-A1 OR CA-2572651-A1 OR US-7909137-B2 OR US-20210178201-A1 OR US-11179584-B2 OR US-5341896-A OR US-4687074-A OR US- 6125966-A OR US- 20120217090-A1 OR US-11850452-B2 OR US-20210178200-A1 OR US-5052514-A OR US-20090255756- 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	2024/07/19 11:09 AM
L14	33	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2024/07/19

		<p>More like doc: CA-2432773-A1</p> <p>Text: (US-20040154863-A1 OR US-7051836-B2 OR US-7063185-B2 OR US-20050139419-A1 OR US-20060169534-A1 OR US-8322488-B2 OR CA-2527459-A1 OR US-20120018248-A1 OR CA-2572651-A1 OR US-7909137-B2 OR US-6016891-A OR US-20210178201-A1 OR US-11179584-B2 OR US-6035966-A OR US-11850452-B2 OR US-20210178200-A1 OR US-4687074-A OR US-6125966-A OR US-20090255756-A1 OR US-20190269948-A1).did.</p>	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)				01:47 PM
L15	32	<p>(Artificial Intelligence)</p> <p>More like doc: US-20220249886-A1</p> <p>Text: (US-11771931-B2 OR US-20220266072-A1 OR US-20200398088-A1 OR US-20200324153-A1 OR US-11351405-B2 OR US-20200398087-A1 OR CA-2719594-A1 OR US-20110101061-A1 OR US-9101789-B2 OR CA-2719594-C OR US-20180126195-A1 OR US-20120217090-A1 OR FR-2649618-A1 OR FR-3132228-A1 OR FR-3132228-B1 OR MX-2017014147-A OR US-20150060195-A1 OR CA-2173181-C OR CA-2173181-A1 OR AT-E230286-T1).did.</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)	OR	ON	ON	2024/07/19 02:33 PM
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L17	33	"6299040" "6533066" "20060027277").pn. OR ("7909137").urpn. AND (PGPB USPT USOC).dbnm. (Artificial Intelligence) More like doc: US-7909137-B2 Text: (US-20060169534-A1 OR US-20120018248- A1 OR US-8322488-B2 OR CA-2572651-A1 OR US-7063185-B2 OR US-20050139419-A1 OR US-20040154863- A1 OR CA-2432773-A1 OR US-7051836-B2 OR CA-2527459-A1 OR US-20120217090-A1 OR US-20090255756- A1 OR US-6125966-A OR PT-2724752-T OR US-20020074185-A1 OR US-8281894-B2 OR US-6732834-B2 OR US-20070204377-A1 OR US-6223854-B1 OR US-4546851-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	2024/07/19 02:35 PM
L18	25	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923- A1 OR US- 20200398087-A1 OR US-20080179136-A1 OR US-20090255756- A1 OR US- 20230173312-A1 OR US-20050139419-A1 OR US-20220249886- A1).did. AND PGPB.dbnm.) OR ((US- 20210228923-A1 OR US-20210101032-A1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, 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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/07/23 11:39 AM

L19	83	OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPI.dbnm.) ("10016633" "10159858 "11122844" "1117958 4" "11351405" "190308 1" "20050139419" "200 50192159" "201002003 29" "20150231422" "20 170291047" "20180126 195" "20180255889" "2 0190192887" "2019026 9948" "20200114181" "2 0200324153" "202003 98087" "20200398088" "2 0210023400" "20210 101032" "20210178200 "20210178201" "2021 0228923" "2021037099 9" "2254179" "3757893" "4318502" "4347914" "4 396091" "4399595" "4 687074" "5010850" "63 64412" "6378174" "685 4801" "7051836" "7063 185" "7178185" "74555 93" "7909137" "832248 8" "8661720" "9162091" "9210978" "202003241 53" "20200398088" "20 210101032" "3757893" "4 687074" "7063185" "8 322488" "10016633" "1 0159858" "11122844" "1 11179584" "1903081" "2 0050139419" "200501 92159" "20100200329" "2 0150231422" "20180 126195" "20180255889 "20190192887" "2019 0269948" "2020011418 1" "20200324153" "202 00398087" "202003980 88" "20210101032" "20 210178200" "20210178 201" "20210228923" "2 0210370999" "3757893 "4318502" "4347914" "4 399595" "4687074" "5 010850" "6378174" "70 51836" "7063185" "717 8185" "7909137" "8322 488" "8661720" "92109 78" "10016633" "10159 858" "11122844" "1117 9584" "1903081" "2005	(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))	OR	ON	ON	2024/07/23 01:28 PM
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		0139419" "20050192159" "20100200329" "20150231422" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20200398088" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999" "3757893" "4318502" "4347914" "4399595" "4687074" "5010850" "6378174" "7051836" "7063185" "7178185" "7909137" "8322488" "8661720" "9210978").PN.					
L20	48	("0572751" "1775736" "1642911" "2252998" "2979028" "2960180" "2979153" "3098479" "3322102").pn. OR ("3757893").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:20 PM
L21	36	(Artificial Intelligence) More like doc: US-3757893-A Text: (EP-0819018-A1 OR EP-0819018-B1 OR US-6244379-B1 OR CN-107441651-B OR US-5228412-A OR US-8056675-B2 OR WO-9324182-A1 OR US-5329884-A OR ES-2793326-T3 OR US-5131490-A OR EP-0511319-A4 OR CA-2067119-C OR EP-3228362-B1 OR US-5531292-A OR CA-2155457-A1 OR US-20180360683-A1 OR RU-2741419-C2 OR CN-107441651-A OR US-3738449-A OR US-6367582-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	2024/07/23 08:20 PM
L22	29	("1351734" "3022856" "3217840" "3695397" "3757893" "3757901" "4311217").pn. OR ("4508193").urpn. AND (PGPB USPT	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:23 PM

L23	40	USOC).dbnm. (Artificial Intelligence) More like doc: US-4508193-A Text: (US-4550801-A OR US-4538704-A OR US-5145036-A OR AU-653576-B2 OR US-6672428-B2 OR US-20030159887-A1 OR US-5671822-A OR US-3717219-A OR US-20130240293-A1 OR US-20160206902-A1 OR EP-0442913-B1 OR US-4341285-A OR US-8261877-B2 OR PT-96520-A OR EP-0442913-A1 OR US-6062340-A OR US-20080230313-A1 OR WO-9516496-A1 OR GB-2259855-A OR US-5186275-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	2024/07/23 08:23 PM
L24	16	("2252998").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:30 PM
L25	38	(Artificial Intelligence) More like doc: US-2252998-A Text: (US-2960180-A OR US-6962232-B2 OR US-8235173-B2 OR CA-2091930-A1 OR US-9168401-B2 OR WO-2015112319-A1 OR WO-2007139954-A2 OR US-20070272484-A1 OR US-9155925-B2 OR FR-3062575-B1 OR US-3869021-A OR CN-105536212-A OR US-8056675-B2 OR US-8353386-B2 OR WO-2005056114-A1 OR FR-3062575-A1 OR US-7140587-B1 OR US-7490610-B2 OR EP-3576849-B1 OR EP-3576849-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	2024/07/23 08:30 PM
L26	4194	L3 OR ((A62B35/0025 OR A62B35/0031 OR A01M31/02).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2024/07/23 08:36 PM

L27	41	(Artificial Intelligence) More like doc: US-20210038929-A1 Text: (EP-3772363-B1 OR EP-3772363-A1 OR DE-102019121171-A1 OR DE-102019121171- B4 OR EP-3225282-B1 OR EP-3225282-A1 OR ES-2793493-T3 OR FR-3063652-A1 OR US-20180345053-A1 OR US-6283248-B1 OR US-10799732-B2 OR EP-3138608-B1 OR US-20070272484-A1 OR GB-2541905-A OR DE-20022993-U1 OR US-20170056692-A1 OR CN-1688366-B OR EP-3138608-A1 OR US-9101789-B2 OR US-6308335-B1).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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO)) (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	2024/07/23 08:40 PM
L28	72	("0330087" "10604892" "20070102240" "2008000719" "20100213004" "20150297937" "20210101032" "2303954" "2600395" "3738449" "4036101" "4099750" "4962929" "5050704" "5062344" "5699657" "5970697" "6712181" "7182361" "7814938" "9162091" "10258814" "20080179136" "20090255756" "8061479" "8292028" "8356691" "8584799" "9320925" "9808659" "10330087" "10604892" "20070102240" "20080000719" "20100213004" "20150297937" "20210101032" "2303954" "2600395" "3738449" "4036101" "4099750" "4962929" "	(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))	OR	ON	ON	2024/07/24 02:12 PM

L29	32	5050704 "5062344 "5699657 "5970697 "6712181 "7182361 "7814938 "9162091 "0330087 "20070102240 "20080000719 "20100213004 "20150297937 "2303954 "2600395 "3738449 "5050704 "5062344 "5699657 "5970697 "6712181 "7814938 "9162091").PN. ((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPL.dbnm.)	(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	2024/08/05 10:46 AM
L30	83	("10016633 "10159858 "11122844 "11179584 "11351405 "1903081 "20050139419 "20050192159 "201002003	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2024/08/05 10:50 AM

		29" "20150231422" "20 170291047" "20180126 195" "20180255889" "2 0190192887" "2019026 9948" "20200114181" " 20200324153" "202003 98087" "20200398088" " "20210023400" "20210 101032" "20210178200 " "20210178201" "2021 0228923" "2021037099 9" "2254179" "3757893" "4318502" "4347914" " 4396091" "4399595" "4 687074" "5010850" "63 64412" "6378174" "685 4801" "7051836" "7063 185" "7178185" "74555 93" "7909137" "832248 8" "8661720" "9162091" "9210978" "202003241 53" "20200398088" "20 210101032" "3757893" " "4687074" "7063185" "8 322488" "10016633" "1 0159858" "11122844" " 11179584" "1903081" " 20050139419" "200501 92159" "20100200329" " "20150231422" "20180 126195" "20180255889 " "20190192887" "2019 0269948" "2020011418 1" "20200324153" "202 00398087" "202003980 88" "20210101032" "20 210178200" "20210178 201" "20210228923" "2 0210370999" "3757893 " "4318502" "4347914" " 4399595" "4687074" "5 010850" "6378174" "70 51836" "7063185" "717 8185" "7909137" "8322 488" "8661720" "92109 78" "10016633" "10159 858" "11122844" "1117 9584" "1903081" "2005 0139419" "2005019215 9" "20100200329" "201 50231422" "201801261 95" "20180255889" "20 190192887" "20190269 948" "20200114181" "2 0200324153" "2020039 8087" "20200398088" " 20210101032" "202101 78200" "20210178201" "	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))				
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		8185" "7909137" "8322488" "8661720" "9210978" "10016633" "10159858" "11122844" "11179584" "1903081" "20050139419" "20050192159" "20100200329" "20150231422" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999" "3757893" "4318502" "4347914" "4399595" "4687074" "5010850" "6378174" "7051836" "7063185" "7178185" "7909137" "8322488" "8661720" "9210978"). PN.					
L32	6227	L4 OR ((A62B35/0025 OR A62B35/0031 OR A62B35/0012 OR A01M31/02).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, 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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2024/08/05 11:28 AM
L33	498	L32 AND bridge	(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))	OR	ON	ON	2024/08/05 11:28 AM
L34	50	(Artificial Intelligence) More like doc: <u>EP-1932565-A1</u> Text: (FR-2909887-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2024/08/05 11:58 AM

L35	42	FR-3062576-A1 OR AU-2004272012-A1 OR EP-3228363-A1 OR CA-2535826-C OR FR-3049870-A1 OR AU-2004272012-B2 OR CA-2535826-A1 OR CN-105709350-B OR CN-101062439-A OR CN-101062439-B OR CH-695542-A5 OR CN-105709350-A OR EP-1557198-A1 OR EP-1459648-A1 OR AT-E487517-T1 OR FR-2865410-A1 OR CA-2089514-C OR US-20020042942-A1 OR US-6438756-B1).did.	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	2024/08/05 05:26 PM
		((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-8333262-B1).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1	(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)				

L36	25	<p>OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.)</p> <p>("2254179" "2581772" "3335468" "4474261" "4546851" "5131490" "8333262" "8464832" "D685676" "9676486" "9993669" "10016633" "10112064" "10232199" "20040163898" "20040194259" "20050082114" "20090314578" "20130104351" "20140224580" "20150231422" "20180154196").pn. OR ("11534633").urpn. AND (PGPB USPT USOC).dbnm.</p>	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 05:28 PM
L37	36	<p>(Artificial Intelligence) More like doc: US-11534633-B2</p> <p>Text: (EP-3332840-A1 OR US-20180154196-A1 OR US-20230065262-A1 OR GB-2559038-A OR GB-2577516-A OR US-20220241625-A1 OR WO-2020065279-A1 OR EP-3852881-A1 OR EP-4035743-A1 OR GB-2557308-A OR GB-2608095-A OR US-20210393998-A1 OR EP-3162411-A1 OR US-20170120087-A1 OR CN-112770816-A OR GB-2607971-A OR WO-2022263418-A1 OR AU-2022292877-A1</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)	OR	ON	ON	2024/08/05 05:28 PM

L38	35	<p>OR EP-4355438-A1 OR CA-3222645-A1).did.</p> <p>(Artificial Intelligence) More like doc: US-20230173312-A1</p> <p>Text: (US-12011623-B1 OR US-20220249886-A1 OR US-20210101032-A1 OR US-11771931-B2 OR US-11623109-B2 OR US-20230248135-A1 OR US-20130068556-A1 OR WO-2018051068-A1 OR EP-3512609-A1 OR US-20210228923-A1 OR US-20240216723-A1 OR US-11964175-B2 OR US-11504556-B2 OR US-20220347501-A1 OR EP-3512609-B1 OR US-4396091-A OR US-20120012421-A1 OR US-11351405-B2 OR US-20200398087-A1 OR WO-8910160-A1).did.</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)	OR	ON	ON	2024/08/05 05:30 PM
L39	38	<p>("0421120" "0502962" "0830134" "1117656" "1550900" "1729945" "1835068" "2189671" "2225865" "2946619" "3998561" "4139956" "4667772" "5060758" "5113551" "5310274" "5383259" "5735329" "5839541" "5947229" "6059335").pn. OR ("6712181").urpn. AND (PGPB USPT USOC).dbnm.</p>	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 05:45 PM
L40	38	<p>(Artificial Intelligence) More like doc: US-6712181-B2</p> <p>Text: (WO-02062193-A1 OR US-20020104711-A1 OR CN-102506095-A OR CN-102506095-B OR US-20130075223-A1 OR WO-2013040823-A1 OR US-6189651-B1 OR US-6059335-A OR FR-3048892-A1 OR US-</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;	OR	ON	ON	2024/08/05 05:45 PM

L41	43	<p>20050273982-A1 OR CA-2749144-C OR US-8312965-B2 OR US-9644692-B2 OR EP-0734743-A1 OR US-20090026011-A1 OR US-5947229-A OR EP-0734743-B1 OR SU-1099971-A1 OR FR-2732226-A1 OR US-7200898-B2).did.</p> <p>((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-8333262-B1).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1 OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR</p>	<p>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	2024/08/05 05:49 PM
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L42	153	US-20220249886-A1 OR US-20020104711-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.) ("0330087" "1924596" "2600395" "3884190" "4099750" "4252084").pn. OR ("4962929").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:14 PM
L43	47	(Artificial Intelligence) More like doc: US-4962929-A Text: (US-5087309-A OR US- 20020029066-A1 OR AU-2011348045-B2 OR AU-2011348045-A1 OR JP-H11244438-A OR JP-2006112021-A OR AU-2002366596-B2 OR AU-2011254063-A1 OR AU-2013205724-A1 OR AU-2011254063-B2 OR AU-2013205725-A1 OR AU-2011247890-A1 OR AU-2002366596-A1 OR AU-2013205723-A1 OR AU-2011247890-B2 OR CN-205337894-U OR US-5388598-A OR AU- 2011247889-B2 OR AU-2011247889-A1 OR JP-2005245482-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	2024/08/05 06:14 PM
L44	204	("0330087" "2600395" "4962929" "5062344" "5540703").pn. OR ("5970697").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:14 PM
L45	40	(Artificial Intelligence) More like doc: US-5970697-A Text: (CA-2245063-A1 OR US-5871193-A OR US- 20070048554-A1 OR US-20070202286-A1 OR CA-2588321-C OR US-7845609-B2 OR CA-2588321-A1 OR	(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,	OR	ON	ON	2024/08/05 06:14 PM

		EP-1990791-A2 OR US-20080283708-A1 OR US-5577299-A OR DE-202015104022-U1 OR JP-S6221889-A OR EP-2777513-B1 OR US-9463013-B2 OR EP-3260052-A2 OR CA-2846244-C OR AU- 2014201522-B2 OR US-5582266-A OR AU- 2014201522-A1 OR EP-2777513-A1).did.	RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L46	288	("2600395").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:16 PM
L47	34	(Artificial Intelligence) More like doc: US-2600395-A Text: (CN-105256622-A OR US-5062344-A OR NZ- 549657-A OR GB- 602948-A OR US- 20050229770-A1 OR US-7165485-B2 OR WO-03102295-A1 OR DE-60314874-T2 OR PT-1509650-E OR GB- 1480826-A OR WO- 2005085518-A2 OR AU-2005219475-A1 OR DE-1030411-B OR US- 20070137163-A1 OR US-7784258-B2 OR RU-2369674-C2 OR US-2118630-A OR AT- E510062-T1 OR RU- 2006134407-A OR NO- 324911-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	2024/08/05 06:16 PM
L48	47	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-8333262-B1 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US- 4508193-A OR US- 2252998-A OR US-	(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	2024/08/05 06:43 PM

L49	20	4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-5970697-A OR US-2600395-A OR US-7107749-B2 OR US-5699657-A).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1 OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1 OR US-20020104711-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.)	(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))	OR	ON	ON	2024/08/06 02:06 PM
L50	28186	polyethylene AND rope	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/06 02:08 PM

L51	4750	L50 AND UHMWPE	(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))	OR	ON	ON	2024/08/06 02:09 PM
L52	1240	L50 AND UHMWPE	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/06 02:09 PM
L53	50	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-8333262-B1 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-5901632-A OR US-5970697-A OR US-2600395-A OR US-7107749-B2 OR US-5699657-A).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-	(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	2024/08/06 02:16 PM

L54	54	20080000719-A1 OR US-20170291047-A1 OR US-20210393998- A1 OR US- 20180154196-A1 OR US-20190210696-A1 OR US-20190301089- A1).did. AND PGPB.dbnm.) OR ((US- 20210228923-A1 OR US-20210101032-A1 OR US-20200398087- A1 OR US- 20220249886-A1 OR US-20020104711- A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565- A1).did. AND FTDB.dbnm.) ("10258814" "10918194 "11351405" "1150455 6" "11511141" "115346 33" "11771931" "11850 452" "11964175" "2002 0104711" "2005013941 9" "20060207828" "200 80000719" "200801791 36" "20090255756" "20 100162882" "20120393 998" "20170291047" "2 0180154196" "2019013 4438" "20190210696" " 20190301089" "202000 39808" "20210038929" " 20210076666" "20210 101032" "20220241624 " "20220249886" "2023 0094095" "2023017331 2" "20240352671" "225 2998" "2600395" "3757 893" "4347914" "45081 93" "4962929" "501085 0" "5699657" "5901632" "5970697" "6712181" " 7063185" "7107749" "7 909137" "8061479" "82 92028" "8333262" "835 6691" "8584799" "9003 579" "9320925" "98086 59").PN. "9003579" "1932565"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2025/08/19 12:49 PM
L55	40	"9003579"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2025/08/19 01:42 PM
L56	25	"1932565"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2025/08/19 02:08 PM

L57	62	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-8333262-B1 OR US-11964175-B2 OR US-5699657-A OR US-9003579-B1 OR US-11511141-B2 OR US-7909137-B2 OR US-7063185-B2 OR US-3757893-A OR US-4508193-A OR US-6712181-B2 OR US-4962929-A OR US-5010850-A OR US-4347914-A OR US-11534633-B2 OR US-5901632-A OR US-5970697-A OR US-2600395-A OR US-7107749-B2 OR US-9162091-B2).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20210101032-A1 OR US-20020104711-A1 OR US-20220249886-A1 OR US-20180154196-A1 OR US-20230094095-A1 OR US-20080000719-A1 OR US-20190301089-	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); EPO)	OR	ON	ON	2025/08/19 02:51 PM
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L58	38	<p>A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20210038929-A1 OR US-20170291047-A1 OR US-20190210696-A1 OR US-20060207828-A1 OR US-20100162882-A1 OR US-20190134438-A1 OR US-20210076666-A1 OR US-20220241624-A1 OR US-20240352671-A1 OR US-20210393998-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1 OR US-20020104711-A1).did. AND DWPI.dbnm.) OR ((US-2252998-A).did. AND USOC.dbnm.) OR ((EP-1932565-A1 OR WO-2018051068-A1).did. AND FTDB.dbnm.)</p> <p>(Artificial Intelligence) More like doc: <u>US-20240352671-A1</u></p> <p>Text: (US-4321854-A OR FR-2851924-A1 OR US-20110027007-A1 OR US-9056656-B2 OR NL-2019011-B1 OR US-10676161-B1 OR US-20240352671-A1 OR WO-2024224284-A1 OR US-8869359-B2 OR EP-2556269-A1 OR JP-2013530351-A OR EP-2556269-B1 OR JP-5961160-B2 OR US-11352241-B2 OR US-20130025099-A1 OR US-20220289535-A1 OR CN-110050321-A OR US-5237875-A OR US-11577945-B2 OR US-10845267-B2).did.</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)	OR	ON	ON	2025/08/19 03:06 PM
L59	42	<p>(Artificial Intelligence) More like doc:</p>	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2025/08/19 03:45 PM

L60	37	US-20230173312-A1 Text: (US-2254179-A OR US-4103758-A OR FR-3072034-B1 OR US-11351405-B2 OR US-11850452-B2 OR US-11504556-B2 OR US-11771931-B2 OR US-20230173312-A1 OR US-5762085-A OR US-6312309-B1 OR US-6095385-A OR US-20210386181-A1 OR US-6101631-A OR CA-2290263-A1 OR US-5009196-A OR US-11655650-B2 OR US-7909000-B1 OR US-12219924-B1 OR US-20230248135-A1 OR WO-2011130364-A1).did.	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	2025/08/19 03:46 PM
		(Artificial Intelligence) More like doc: US-20220249886-A1 Text: (US-1903081-A OR US-2254179-A OR US-3757893-A OR US-4318502-A OR US-4396091-A OR US-4399595-A OR US-4347914-A OR US-4687074-A OR US-5010850-A OR US-6364412-B1 OR US-6378174-B1 OR US-6854801-B2 OR US-7051836-B2 OR US-7909137-B2 OR US-7063185-B2 OR US-20050192159-A1 OR US-7178185-B1 OR US-7455593-B1 OR US-9162091-B2 OR US-8959664-B2).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)				

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PE2E SEARCH - Search History (Similarity Search)

No Similarity Results available



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Documents

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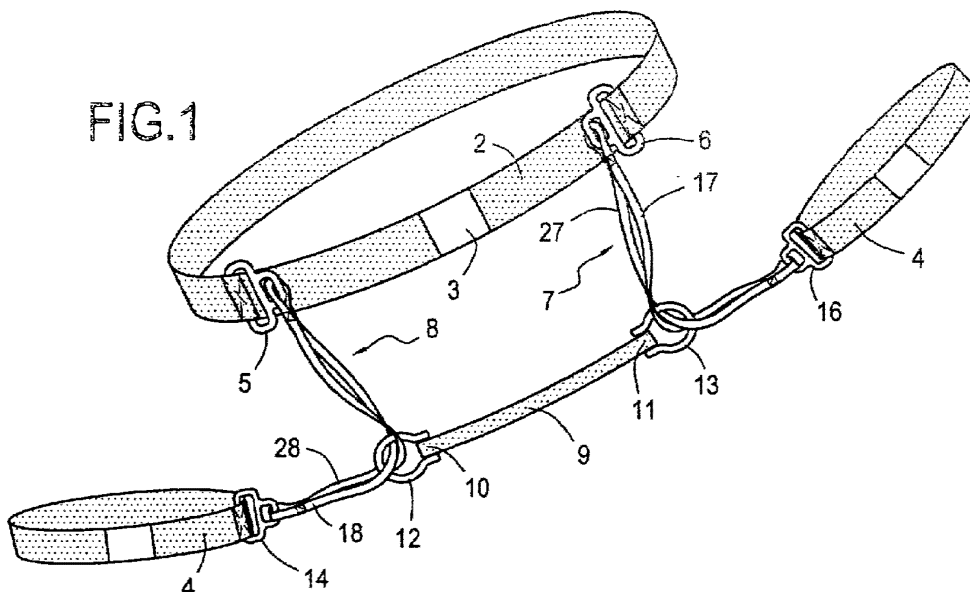
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22, avenue de Friedland
75008 Paris (FR)(54) **Dispositif de suspension à triangulation automatique**

(57) Dispositif de suspension destiné à être appliqué à un utilisateur ou un objet quelconque pour lui permettre d'être suspendu à une corde le long de laquelle il va ainsi pouvoir se déplacer et comportant un premier point de support de charge principal, par exemple une ceinture (1) à dosseret destiné à entourer le bassin de l'utilisateur et au moins deux points de support de charge auxiliaires, par exemple deux cuissardes (4) destinées à chacune entourer une cuisse de l'utilisateur, et un système de liaison pour relier le premier point de support de charge principale aux au moins deux points de support de charge

auxiliaires constitué d'au moins une première courroie (7) reliant le point de support de charge principale à l'un des deux points de support auxiliaire et une deuxième courroie (8) reliant le point de support principal au deuxième point de support auxiliaire et une courroie (9) centrale reliée à chacune des au moins deux courroies auxiliaires, la courroie centrale étant destinée à être suspendue à une corde principale le long de laquelle l'utilisateur souhaite pouvoir se déplacer dans un sens ou dans l'autre, est caractérisé en ce qu'il est prévu des moyens de réglage automatique de l'équilibre.

FIG.1**EP 1 932 565 A1**

Description

[0001] La présente invention se rapporte à un dispositif de suspension, notamment un dispositif qui permet à une personne d'être suspendue à une corde principale, notamment pour se déplacer le long de cette corde, par exemple par coulissement, par exemple pour élaguer un arbre. Cependant, d'autres applications sont également possibles, comme l'escalade, notamment sportive.

[0002] On connaît déjà des dispositifs de ce genre dans l'art antérieur. Ils comportent une ceinture à dosseret destinée à ceinturer le bassin de l'utilisateur et deux cuissardes destinées à entourer chacune une partie des cuisses de l'utilisateur, les deux cuissardes étant reliées à la ceinture à dosseret par un système de courroies, comportant une courroie latérale gauche et une courroie latérale droite, qui chacune relie l'une des cuissardes droite et gauche respective à la ceinture à dosseret, et une courroie centrale formant pont entre les deux courroies latérales droite et gauche.

[0003] Ces dispositifs de l'art antérieur présentent, notamment, les inconvénients suivants. Lorsque l'utilisateur est stabilisé à un niveau donné le long de la corde principale, il souhaite en général effectuer des mouvements vers la gauche, vers la droite, vers l'arrière ou vers l'avant pour toute sorte de raison, par exemple pour réaliser un élagage. Lors de ces mouvements, le dispositif qui le suspend à la corde n'est plus équilibré de manière exacte et subit des contraintes non uniformes. Si, par exemple, l'utilisateur se penche vers la droite, il apparaît des forces ou contraintes plus importantes sur la partie gauche du système de courroies et, au cours du temps ces déplacements déséquilibrés dans toutes les directions entraînent une usure prématurée de la courroie centrale qui est en liaison avec la corde principale et cette courroie centrale doit être remplacée fréquemment. Or ce remplacement n'est pas simple à effectuer. En outre, lorsque l'utilisateur tente d'atteindre des endroits positionnés à sa droite, à sa gauche ou vers l'arrière ou l'avant et sort de la position de base dans laquelle il se tient droit, il doit de lui-même effectuer une compensation pour s'opposer au déséquilibre du système et cette compensation l'oblige à exercer constamment avec son corps des forces s'opposant aux forces issues du déséquilibre, ce qui fait qu'il n'est pas dans une position la plus agréable possible, alors même qu'il doit dans cette position effectuer un travail difficile, par exemple élaguer un arbre.

[0004] Suivant un perfectionnement déjà connu, on peut prévoir de régler manuellement la position relative de la courroie centrale par rapport à chacune des courroies latérales par l'intermédiaire de boucles. Cependant, ce système à boucles présente l'inconvénient qu'à chaque nouveau déplacement de l'utilisateur, il doit effectuer un nouveau réglage des boucles pour équilibrer son système de liaison entre le dosseret et les cuissardes et l'adapter à la nouvelle position. Dès qu'il souhaite passer dans une autre position, il doit recommencer tout le processus de réglage. Ainsi, l'utilisation de ce dispositif

d'escalade n'est-elle pas très simple.

[0005] Au document US 2002/042942, il est décrit un dispositif du domaine de la présente invention. Il est mentionné des moyens automatiques pour serrer le dispositif sur le pompier lorsque celui-ci s'accroche à une corde et se lance dans le vide. Cependant, ces moyens automatiques sont uniquement destinés au serrage du dispositif autour du pompier et une fois le serrage effectué, le dispositif ne se modifie plus en fonction des mouvements du pompier. Il en résulte que l'usure de la lanière 578 formant pont en raison du contact avec le mousqueton 552 (voir la figure 3) est très grande, ce qui nécessite de changer cette lanière fréquemment. En utilisation, la lanière formant pont « remonte » au-dessus de la ceinture 564, en entraînant vers le haut les boucles 550 et 550a et les lanières 534 et 546 qui viennent se bloquer autour de la ceinture 564 de sorte que l'utilisateur est bien serré automatiquement dans le dispositif. Cependant, une fois serré dans le dispositif sous l'effet de son poids, suspendu au mousqueton 552, l'utilisateur ne peut plus régler le dispositif dans la direction transversale, les lanières 546a et 546 s'étant enroulées autour de la ceinture 564 et formant un noeud qui ne peut plus coulisser. Une fois le pompier serré dans le dispositif, lorsqu'il fait un mouvement de basculement vers la gauche ou la droite, les lanières ne se déplacent pas et un frottement important se produit sur la lanière en pont 578 qui s'use prématurément.

[0006] La présente invention vise à surmonter les inconvénients de l'art antérieur en proposant un dispositif d'escalade du genre mentionné précédemment dans lequel l'usure de la courroie centrale formant pont est diminuée, de sorte qu'il n'est plus nécessaire d'en changer aussi souvent.

[0007] Suivant l'invention, un dispositif de suspension destiné à être appliqué à un objet ou un utilisateur pour lui permettre d'être suspendu à une corde principale, notamment le long de laquelle il va pouvoir se déplacer, notamment par coulissement, et comportant au moins un support de charge principal, par exemple une ceinture à dosseret destinée à entourer le bassin de l'utilisateur, et au moins deux supports de charge auxiliaires, par exemple deux cuissardes destinées à chacune entourer une cuisse de l'utilisateur, et un système de liaison pour relier le au moins un support de charge principale au aux moins deux supports de charge auxiliaires, le système de liaison étant constitué au moins d'une première courroie reliant le au moins un support de charge principal à l'un des deux supports auxiliaires, d'une deuxième courroie reliant le au moins un support principal au deuxième support auxiliaire et d'une courroie centrale reliée à chacune des au moins deux courroies auxiliaires, est caractérisé en ce qu'il est prévu des moyens de réglage automatique de l'équilibrage de l'objet ou de l'utilisateur à l'état suspendu à la corde principale, de sorte que celui-ci, lorsqu'il passe d'une position à une autre dans un domaine de positions correspondant à un basculement vers l'avant, l'arrière, la gauche, la droite ou une combi-

naison de deux basculements de ce genre, reste en une position équilibrée, dans laquelle il peut rester, notamment en étant inerte comme un mannequin.

[0008] Ainsi suivant l'invention, si on remplace l'utilisateur vivant par un mannequin sans vie de forme identique, celui ci va être maintenu en position équilibrée par le système de l'invention dans une grande plage de positions possibles, entre penché vers la droite, penché vers la gauche, penché vers l'avant, penché vers l'arrière ou une combinaison de deux de ces mouvements, et ce de manière automatique. Dans les dispositifs de suspension antérieurs, seule la position centrale est équilibrée et si on penche un mannequin ou un objet quelconque dans une direction quelconque, celui ci continue de basculer sous l'effet de son poids. Lorsqu'il s'agit d'un être humain, dans le cas de ces dispositifs de l'art antérieur, lorsqu'il se penche, il peut en exerçant une force lutter contre ce basculement. Le mannequin sans vie ou l'objet ne le peut pas. Ainsi, suivant l'invention, les moyens de réglage automatique sont tels qu'il maintienne un mannequin sans vie de la forme d'un être humain ou un objet quelconque en équilibre même dans des positions penchées autre qu'une position d'équilibre de départ, et ce de manière automatique, c'est à dire sans intervention manuelle sur le dispositif. Il en résulte pour l'utilisateur un grand confort, en particulier lorsqu'il élague des arbres. Il peut concentrer tous ses efforts sur l'élagage sans avoir à se soucier de se maintenir en équilibre.

[0009] Suivant un perfectionnement de l'invention, la suspension s'effectue en au moins un point de suspension de la courroie centrale.

[0010] On obtient ainsi une moindre usure de cette courroie centrale et une plus longue durée de vie de celle ci.

[0011] Suivant un perfectionnement de l'invention, les moyens de réglage automatique sont agencés de manière à régler automatiquement la résultante des forces appliquées par les charges sur le au moins un point de suspension de la courroie centrale de sorte que cette résultante ait une composante latérale, c'est à dire dans le plan de la courroie, sensiblement nulle.

[0012] On obtient ainsi, en utilisation, un équilibrage parfait pour l'utilisateur ou l'objet dans sensiblement toutes les positions qu'il souhaite prendre. Il en résulte une usure moindre sur la courroie centrale qui, par conséquent, a moins besoin d'être changée que dans l'art antérieur. En outre, l'utilisateur se fatigue moins lors d'un travail, notamment dans le cas où il élague des arbres. En effet, avec ce système, il peut se maintenir en équilibre sans être nécessairement droit ni avoir à modifier de lui-même par des systèmes compliqués à boucle les positions relatives des courroies du système de liaison.

[0013] Suivant un mode de réalisation préféré de l'invention, les moyens de réglage automatique sont agencés de manière à régler la position relative de la courroie centrale par rapport au aux moins deux courroies auxiliaires, en fonction des mouvements de l'utilisateur.

[0014] Suivant un perfectionnement de l'invention, il

est prévu au moins deux anneaux fixées à la courroie centrale formant pont, notamment à ses deux extrémités, et qui coulisent le long des courroies auxiliaires.

[0015] Suivant un mode de réalisation préféré de l'invention, les moyens de réglage automatique sont constitués par le fait qu'il est prévu au moins deux anneaux fixées à la courroie centrale formant pont, notamment à ses deux extrémités, et qui coulisent le long des courroies auxiliaires et qu'au moins une des courroies auxiliaires, de préférence chacune des au moins deux courroies auxiliaires est constituée de deux lanières s'étendant sensiblement sur la même longueur et sensiblement parallèlement l'une à l'autre, les deux lanières passant à l'intérieur de l'anneau coulissant le long de la courroie auxiliaire respective, l'une des lanières étant torsadée par rapport à l'autre, de sorte que ladite une des lanières pénètre dans l'anneau par l'un des côtés de l'anneau et l'autre lanière y pénètre par l'autre côté et ladite l'une des lanières sort du côté par lequel ladite autre lanière est entrée et l'autre lanière sort de l'anneau par le côté par lequel ladite l'une des lanières y est entrée.

[0016] Il est ainsi formé une sorte de noeud ou croisement au niveau de l'anneau, qui est ainsi supporté entre les deux lanières et qui peut coulisser le long des deux lanières entre celles-ci. En outre, la torsion créée au niveau d'une lanière fait que le coulisement a lieu avec un certain frottement permettant d'assurer un coulisement progressif, de manière fluide et sans à-coups, jusqu'à la position d'équilibre sans dépasser celle-ci.

[0017] Suivant un perfectionnement de l'invention, les lanières sont en forme de bandes plates qui forment une surface dite de Moëbus.

[0018] On décrit maintenant uniquement à titre d'exemple un mode de réalisation de l'invention en se reportant au dessin, dans lequel :

la figure 1 représente, suivant une vue en perspective, un dispositif d'escalade suivant l'invention à l'état non monté sur l'utilisateur ;

la figure 2 représente le dispositif d'escalade de la figure 1 monté sur un utilisateur ;

la figure 3 représente un utilisateur muni du dispositif suivant l'invention dans une première position équilibrée ;

la figure 4 est une vue en perspective équivalente à celle de la figure 3 dans laquelle l'utilisateur est dans une autre position également équilibrée alors qu'il s'est penché vers l'arrière ; et

la figure 5 est une vue équivalente à celle des figures 3 et 4, dans laquelle l'utilisateur est également dans une position équilibrée alors qu'il s'est penché vers la gauche, par exemple pour aller chercher quelque chose loin vers la gauche.

[0019] A la figure 1 il est représenté un dispositif d'escalade suivant l'invention. Celui-ci est constitué d'une part, d'un dossier destiné à s'appliquer autour du bassin de l'utilisateur et à y être fixé par une ceinture 2 ajustable

par un système à boucle 3. Deux cuissardes 4 destinées à entourer les cuisses de l'utilisateur et ayant une dimension réglable également par l'intermédiaire d'un système à boucle classique, sont reliées au dosseret 1; ou plus exactement à la ceinture 2, par une boucle métallique 6. Le système de liaison entre les cuissardes et le dosseret comporte une première courroie auxiliaire 7, une deuxième courroie auxiliaire 8 et une courroie centrale 9. Une première extrémité de chaque courroies auxiliaires 7 et 8 est fixée de manière classique aux boucles 6 (repliement de la bande sur soi même avec enfermement de la boucle et couture de fixation), tandis que l'autre extrémité de chacune des courroies 7 et 8 est fixée par une boucle identique à la boucle 6 et de la même manière classique également à la boucle 16 de sa cuissarde respective. La courroie 9 centrale est constituée d'une bande ou lanière double qui à chacune de ses extrémités 10 et 11 est terminée par un anneau 12 et 13 dans l'intérieur duquel pénètrent, pour l'anneau 13, la courroie 7 et pour l'anneau 12, la courroie 8.

[0020] La courroie 7 est constituée de deux bandes plates 17 et 27, tandis que la courroie 8 est constituée de deux bandes plates 18 et 28. Les deux bandes 17 et 27 se rejoignent à chacune de leurs deux extrémités pour être fixées à la boucle de fixation 6 et à la boucle de fixation 16 opposée. La courroie 7 s'étend depuis la boucle 6 en passant à travers l'anneau 13 jusqu'à la boucle 16. Pour passer dans l'anneau 13, la bande 17 y entre par le côté extérieur (le côté tourné vers l'extérieur de la figure 1) et en sort par le côté opposé (vers l'intérieur de la figure), tandis que la bande 27 pénètre dans l'anneau par le côté intérieur et en sort par le côté extérieur. Il est ainsi formé à l'intérieur de l'anneau une sorte de croisement 30 entre les deux bandes. La même description s'applique évidemment pour les deux bandes 18, 28 de la courroie 8 qui passent à l'intérieur de l'anneau 12. En particulier, les bandes 17 et 27 (respectivement 18 et 28) sont constituées d'une même bande unique repliées sur elle même.

[0021] Chaque anneau 12 et 13 peut coulisser le long de la courroie 7 ou 8 en ayant une partie de celui-ci qui se trouve du côté supérieur du croisement à l'intérieur entre les deux bandes 17, 27 et en ayant une autre partie qui se trouve en dessous du croisement 30 et entre les deux bandes 17, 27, les deux bandes ayant ainsi été inversées au niveau du croisement, de sorte que celle qui se trouvait à l'extérieur de la figure se trouve maintenant à l'intérieur et vice versa.

[0022] A la figure 2 on voit le dispositif de la figure 1 monté sur un utilisateur. Les deux cuissardes entourent chacune une cuisse de l'utilisateur, tandis que le dosseret est serré contre le dos de la personne par la ceinture 2. La lanière 9 formant pont entre les deux courroies 7 et 8 est, d'autre part, suspendue en un point 40 de suspension à un anneau 41 qui, lui-même, peut coulisser le long d'une corde 50 principale, l'utilisateur pouvant bloquer en n'importe quelle position le long de la corde 50 le coulisement de l'anneau 41 par un système de blo-

cage qui n'est pas représenté aux figures mais qui est classique. Lorsqu'il est dans une position suspendue donnée en un point donné de la corde 50, l'utilisateur est maintenu en suspension équilibrée par le dispositif d'escalade suivant l'invention.

[0023] A la figure 3, il est représenté une position d'équilibre possible, dans laquelle la courroie centrale 9 est suspendue à l'anneau 41 en ayant deux tronçons de part et d'autre de l'anneau 41 sensiblement de même longueur et les deux courroies auxiliaires ont également chacune deux tronçons, de part et d'autre de leur anneau 12, 13 respectif, sensiblement de même longueur. Trois forces issues des trois charges supportées agissent au point de suspension. La résultante des trois forces agissant sur le point de suspension est sensiblement normale (perpendiculaire) à la courroie, de sorte que le frottement de l'anneau 41 sur la courroie centrale est faible, voir nul.

[0024] A la figure 4, on voit que l'utilisateur s'est penché en inclinant le buste vers l'arrière et en remontant les jambes vers le haut pour atteindre une position sensiblement couchée. Dans cette position, les deux anneaux 12, 13 ont coulisé le long des deux courroies 7 et 8 dans une proportion sensiblement égale, de sorte que les deux courroies 7 et 8 ont chacune maintenant deux tronçons séparés par un anneau respectif et dont l'un est de grande longueur par rapport à l'autre. L'utilisateur est toujours en position équilibrée. La charge appliquée sur la courroie centrale au point de suspension par l'anneau est toujours sensiblement perpendiculaire à la courroie centrale et il n'y a sensiblement pas d'usure liée à un frottement qui apparaîtrait en raison d'une force longitudinale (le long de la courroie) liée à un déséquilibre dans le système, force qui aurait été créée si l'utilisateur s'était penché sans que les anneaux ne modifient leur position le long des courroies auxiliaires. Il en résulte que l'usure sur la courroie centrale est fortement diminuée.

[0025] A la figure 5, on voit que maintenant l'utilisateur s'est penché vers la gauche, par exemple pour atteindre un point éloigné vers sa gauche. Le point de suspension 40 s'est déplacé le long de la courroie centrale, de sorte qu'il divise maintenant cette courroie en deux tronçons qui ne sont plus de même dimension. Le tronçon du côté gauche (côté duquel l'utilisateur s'est penché) de l'anneau 41 est maintenant plus grand que le tronçon du côté droit de l'anneau. De même, les positions relatives des anneaux 12 et 13 par rapport à leurs courroies 7 et 8 respectives se sont maintenant modifiées, la courroie 7 de gauche étant divisée par son anneau 13 en deux tronçons, l'un étant beaucoup plus court que l'autre (celui du côté de l'utilisateur). De même, en ce qui concerne la courroie 8 du côté droit, les deux tronçons de part et d'autre de l'anneau 12 sont sensiblement égaux.

[0026] L'utilisateur est toujours équilibré, la force exercée au point de suspension par les charges étant également sensiblement perpendiculaire à la courroie centrale et sans composante longitudinale, de sorte qu'il n'y a pas d'usure. L'utilisateur peut rester dans cette position en faisant beaucoup moins d'efforts que si les deux an-

neaux étaient restés en position identique par rapport aux courroies latérales. En effet, il n'y a plus de composante longitudinale contre laquelle il doit lutter pour rester dans la position souhaitée.

[0027] On a ainsi décrit un système qui automatiquement, équilibre les charges appliquées aux trois points de support de charge, de sorte que la force de suspension exercée par l'anneau sur la courroie centrale reste toujours sensiblement « verticale » quelle que soit la position qu'il prenne à l'état suspendu. Au fur et à mesure que l'utilisateur se déplace, les anneaux coulisent lentement le long des courroies latérales et atteignent une nouvelle position équilibrée correspondant à la nouvelle position d'équilibre en répartissant les différentes forces exercées sur le système de manière équilibrée. On obtient ainsi une régulation automatique de l'équilibre en fonction des efforts de l'utilisateur. Le système effectue ce que l'on appelle une triangulation des forces, c'est à dire qu'il fait en sorte automatiquement que les trois forces issues des trois supports ait une résultante, dans un système de coordonnées XYZ, dans lequel XY correspondraient au plan passant par les trois supports et Z la perpendiculaire à ce plan, qui s'étend suivant l'axe des Z uniquement.

[0028] Suivant l'invention, si on remplace un utilisateur vivant par un mannequin sans vie, celui ci va être maintenu en position équilibrée par le système de l'invention dans une grande plage de positions possibles, entre penché vers la droite, penché vers la gauche, penché vers l'avant, penché vers l'arrière ou une combinaison de deux de ces mouvements, et ce de manière automatique. Dans les dispositifs d'escalade antérieur, seule la position centrale est équilibrée et si on penche un mannequin dans une direction quelconque, celui ci va tomber. Lorsqu'il s'agit d'un être humain, dans le cas de ces dispositifs de l'art antérieur, lorsqu'il se penche, il peut en exerçant une force s'opposer à cette chute. Le mannequin sans vie ne le peut pas. Ainsi, suivant l'invention, les moyens de réglage automatique sont tels qu'il maintienne un mannequin sans vie de la forme d'un être humain en équilibre même dans des positions penchées autre qu'une position d'équilibre de départ, et ce de manière automatique, c'est à dire sans intervention manuelle sur le dispositif.

Revendications

1. Dispositif de suspension destiné à être appliqué à un utilisateur ou à un objet de forme quelconque pour lui permettre d'être suspendu à une corde principale et comportant au moins un support de charge principal, par exemple une ceinture (1) à dossier destiné à entourer le bassin de l'utilisateur, et au moins deux supports de charge auxiliaires, par exemple deux cuissardes (4) destinées à chacune entourer une cuisse de l'utilisateur, et un système de liaison pour relier le au moins un support de charge princi-

pale au aux moins deux supports de charge auxiliaires, le système de liaison étant constitué d'au moins une première courroie (7) reliant le au moins un support de charge principal à l'un des deux supports auxiliaires et une deuxième courroie (8) reliant le au moins un support principal au deuxième support auxiliaire et d'une courroie (9) centrale reliée à chacune des au moins deux courroies auxiliaires, **caractérisé en ce qu'il** est prévu des moyens de réglage automatique de l'équilibrage de l'utilisateur ou de l'objet, de sorte que celui ci, à l'état suspendu à la corde principale, lorsqu'il passe d'une position à une autre dans un domaine de positions correspondant à un basculement vers l'avant, l'arrière, la gauche, la droite ou une combinaison de deux basculements de ce genre, reste en une position équilibrée, dans laquelle il peut rester, notamment en étant inerte comme un mannequin.

2. Dispositif suivant la revendication 1, **caractérisé en ce que** la suspension s'effectue en au moins un point (40) de suspension de la courroie centrale.
3. Dispositif suivant la revendication 1 ou 2, **caractérisé en ce que** les moyens de réglage automatique sont agencés de manière à régler automatiquement la résultante des forces appliquées par les charges sur le au moins un point de suspension de la courroie centrale de sorte que cette résultante ait une composante latérale, c'est à dire dans le plan de la courroie, sensiblement nulle.
4. Dispositif suivant l'une des revendications 1 à 3, **caractérisé en ce que** les moyens de réglage automatique sont agencés de manière à régler la position relative de la courroie (9) centrale par rapport au aux moins deux courroies auxiliaires, en fonction des mouvements de l'utilisateur.
5. Dispositif suivant l'une des revendications 1 à 4, **caractérisé en ce que** il est prévu au moins deux anneaux (10, 13) fixés à la courroie centrale formant pont, notamment à ses deux extrémités, et qui coulisent le long des courroies auxiliaires.
6. Dispositif suivant l'une des revendications 1 à 5, **caractérisé en ce que** les moyens de réglage automatique sont constitués par le fait qu'il est prévu au moins deux anneaux fixés à la courroie centrale formant pont, notamment à ses deux extrémités, et qui coulisent le long des courroies auxiliaires et qu'au moins une des courroies (7, 9) auxiliaires, de préférence chacune des au moins deux courroies auxiliaires est constituée de deux lanières (17, 27; 18, 28) s'étendant sensiblement sur la même longueur et sensiblement parallèlement l'une à l'autre, les deux lanières passant à l'intérieur de l'anneau coulissant le long de la courroie auxiliaire respective,

l'une des lanières étant torsadée par rapport à l'autre, de sorte que ladite une des lanières pénètre dans l'anneau par l'un des côtés de l'anneau et l'autre lanière y pénètre par l'autre côté et ladite l'une des lanières sort du côté par lequel ladite autre lanière est entrée et l'autre lanière sort de l'anneau par le côté par lequel ladite l'une des lanière y est entrée.

7. Dispositif suivant la revendication 6, **caractérisé en ce que** les lanières (17, 27; 18, 28) sont en forme de bandes plates qui forment une surface dite de Möbius.

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FIG.1

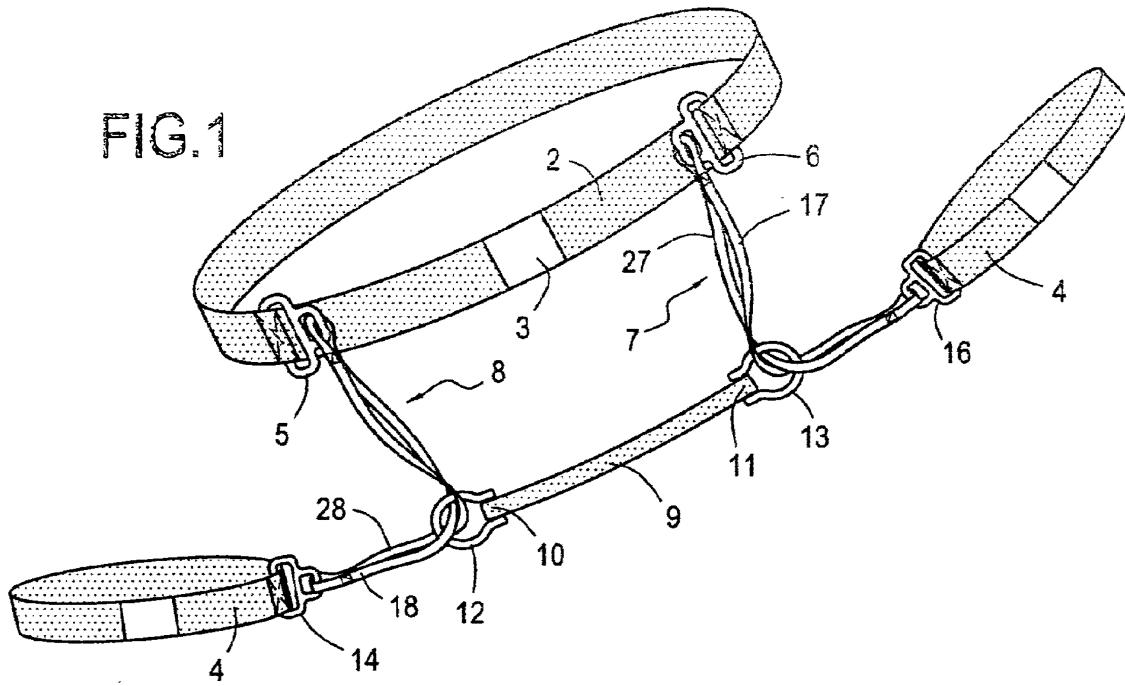
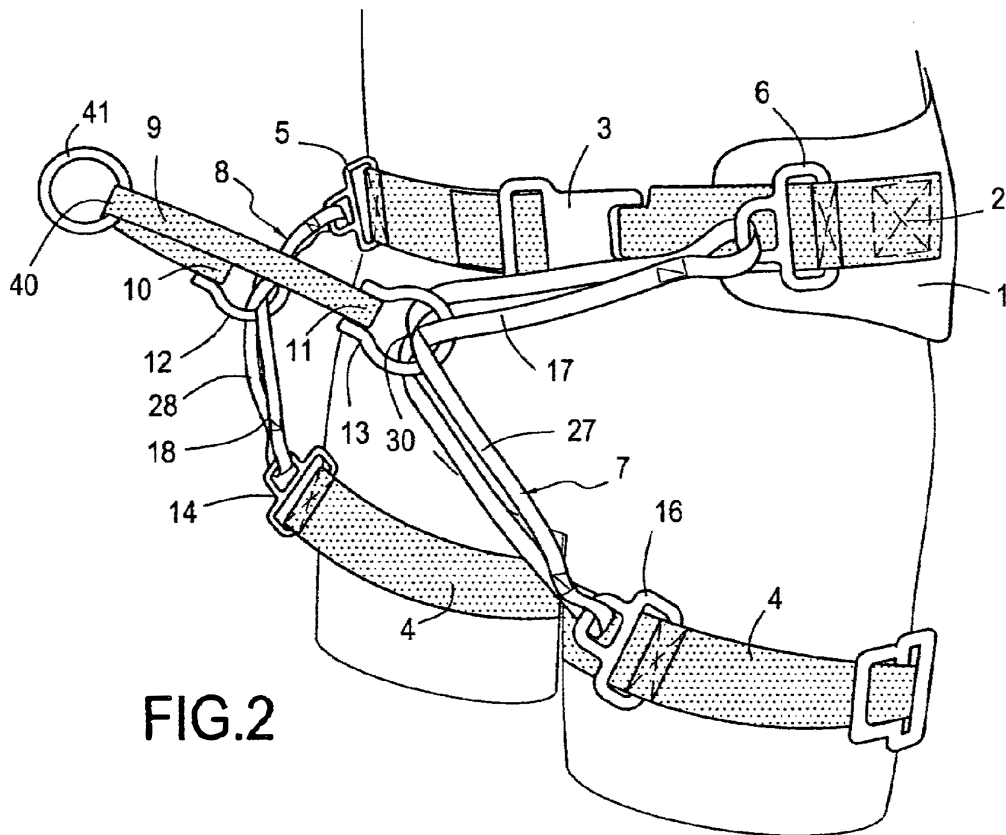
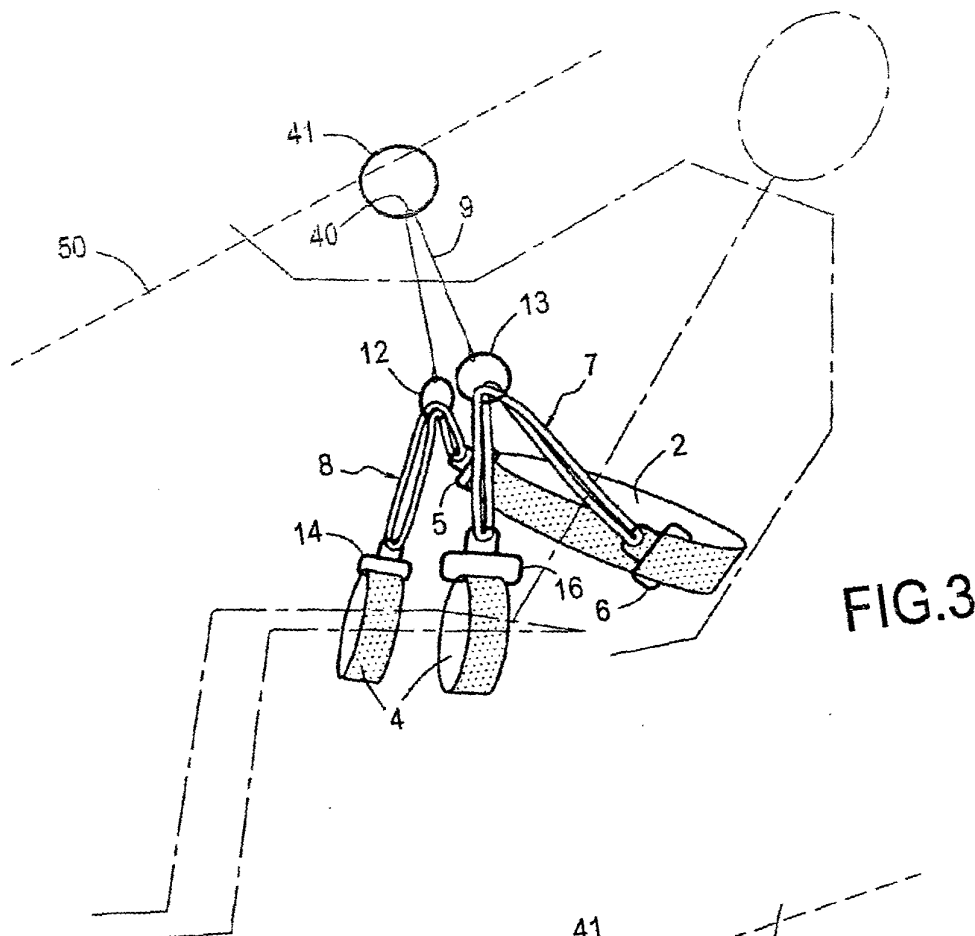
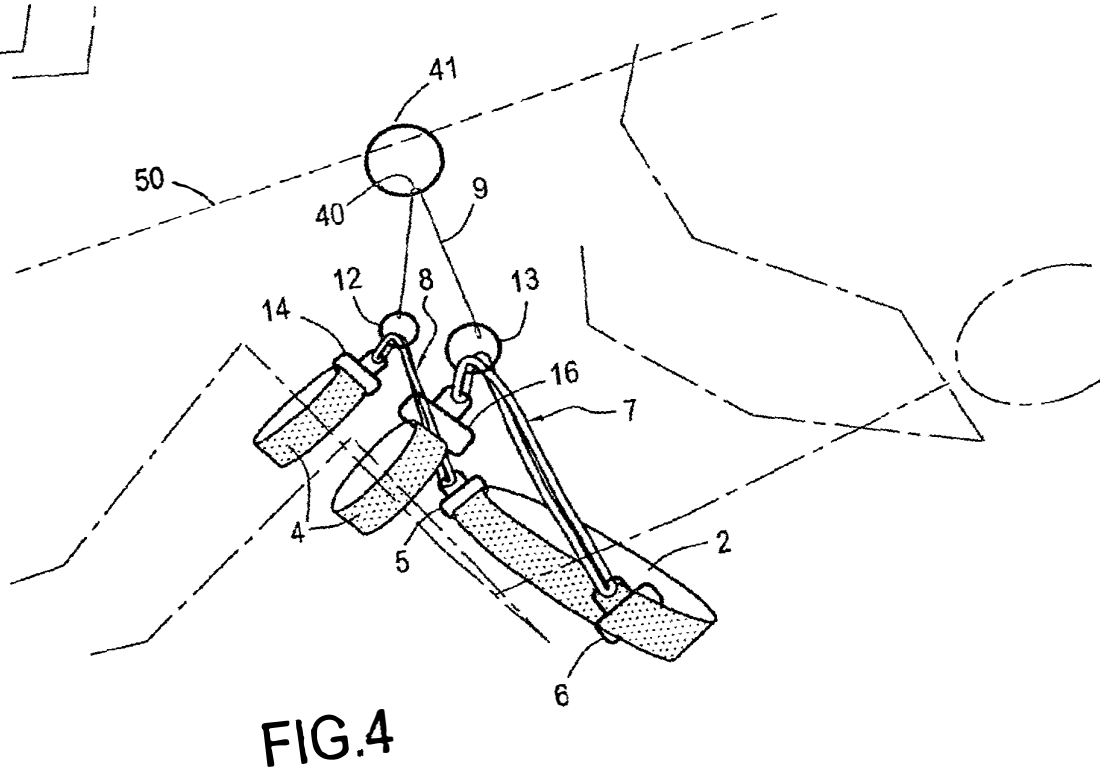


FIG.2





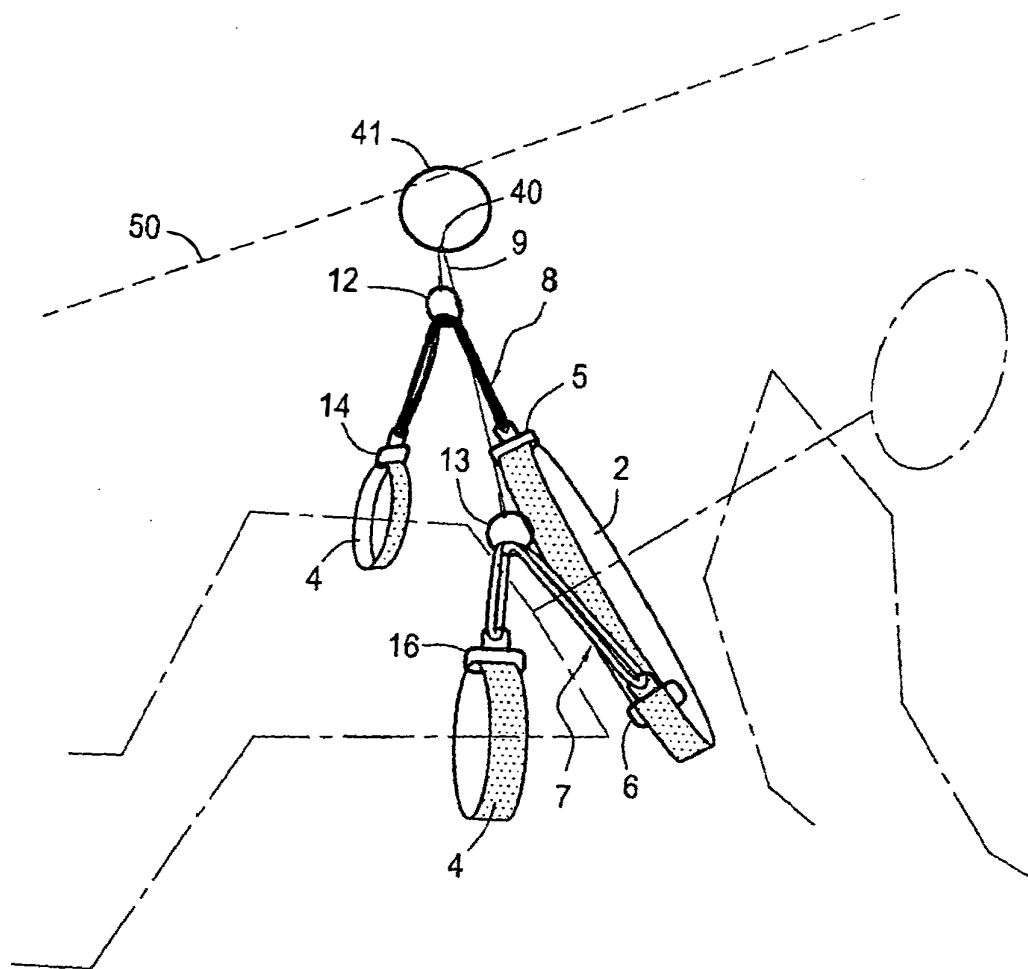


FIG.5

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**ANNEXE AU RAPPORT DE RECHERCHE EUROPEENNE
RELATIF A LA DEMANDE DE BREVET EUROPEEN NO.**

EP 07 29 1408

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche européenne visé ci-dessus.

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Document brevet cité au rapport de recherche	Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
US 2002042942 A1	18-04-2002	AUCUN	

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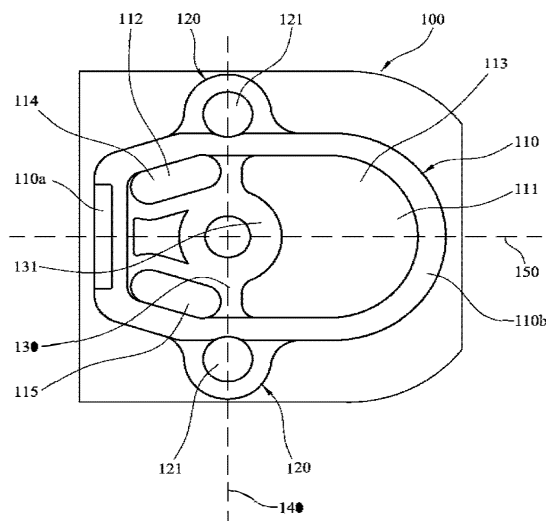


Figure 3

(57) Abstract: A harness for supporting a user in a suspended position is disclosed, together with a harness connector. The harness comprises a waist belt for extending around a user's waist, and two leg bands configured to extend around a left and right leg, of a user. The harness further comprises a cradle for coupling the leg bands with the waist belt, and which comprises at least two harness connectors. The harness connectors comprise a closed loop first frame defining a first aperture, at least two closed loop second frames rigidly coupled to the first frame, each closed loop second frame defining a second aperture, and a bridging member which extends across the first aperture between the at least two second apertures. The bridging member defines a third aperture nested within the first aperture, and the at least two second apertures and third aperture are linearly aligned.

HARNESS CONNECTOR AND HARNESS

The present invention relates to a harness connector and a harness for supporting a user in a suspended position.

Harnesses for arborists typically comprise a short rope section which bridges a left and right side of the harness so that a supporting rope can be suitably anchored thereto. The so-called “rope bridge” offers a coupling point for the rope which can move across the harness as the user moves around a tree for example. However, the rope bridge offers a limited anchorage point such that it is difficult for a user to transfer between trees or other transfer between different supporting ropes.

The present invention seeks to improve harnesses by providing harness connectors which increase versatility for arborists and the like when operating in a suspended state at elevated positions.

In accordance with a first aspect of the present invention, there is provided a harness connector comprising a closed loop first frame defining a first aperture, at least two closed loop second frames rigidly coupled to the first frame, each closed loop second frame defining a second aperture and a bridging member which extends across the first aperture between the at least two second frames, the bridging member defining a third aperture nested within the first aperture, wherein the at least two second apertures and third aperture are linearly aligned.

In an embodiment, the bridging member separates the first aperture into a proximal aperture which extends adjacent a proximal end of the connector and a distal aperture which extends adjacent a distal end of the connector.

In an embodiment, the first frame comprises a linear portion and an arcuate portion which extends to opposite ends of the linear portion. In this respect, the first frame may be substantially D-shaped. The connector may further comprise a connecting member which

extends between a proximal end of the connector and the bridging member. The connecting member separates the proximal aperture into two elongate apertures.

The linear portion of the first frame preferably extends along the proximal end of the connector and the arcuate portion preferably extends along the distal end of the connector.

5 In an embodiment, the at least two second apertures and third aperture are aligned along a first axis which extends substantially transverse to a second axis of the connector. Preferably the second axis is an axis of symmetry of the connector.

In an embodiment, the connecting member extends along the second axis. The elongate apertures extend along respective axes which are acutely orientated relative to the second axis. In an embodiment, the respective axes diverge with respect to each other along 10 the connector in a direction which is from the proximal end to the distal end of the connector.

In an embodiment, the first frame, at least two second frames, bridging member and connecting member extend in a common plane such that the connector is substantially planar.

15 In an embodiment, each of the at least two second apertures and third aperture is a substantially circular aperture.

In an embodiment, the distal aperture is an arcuate aperture.

In an embodiment, the connector is formed of a rigid material such as a metal. Preferably the connector is formed of aluminium.

20 In accordance with a second aspect of the present invention, there is provided a harness for supporting a user in a suspended position, the harness comprising a waist belt for extending around a user's waist and two leg bands configured to extend around a left and right leg of a user, wherein the harness further comprises a cradle for coupling the leg bands with the waist belt, the cradle comprising at least two harness connectors of the first aspect of the invention.

In an embodiment, the harness connectors are disposed at a front of the harness so that the harness connectors extend at the front of a user during use.

In an embodiment, the cradle comprises a plurality of belt straps which extend between the waist belt and the harness connectors and a plurality of band straps which extend between
5 the leg bands and the harness connectors.

In an embodiment, a proximal end of the belt straps are rigidly coupled to the waist belt and a distal end of each belt strap is looped around the first frame through the first aperture of a separate connector. The cradle preferably further comprises a plurality of buckles for adjusting the length of each belt strap.

10 In an embodiment, a proximal end of the band straps are rigidly coupled to the leg bands and a distal end of each band strap is looped around the first frame through the first aperture of a separate connector. The cradle preferably further comprises a plurality of buckles for adjusting the length of each band strap.

In an embodiment, the belt straps and band straps are looped around the first frame
15 through the proximal aperture and preferably through a separate elongate aperture of each connector. The divergent nature of the elongate apertures offers an improved comfort for the user as the belt straps and leg straps become held in position by virtue of the orientation of the section of the first frame which defines the elongate apertures. The first frame section extends substantially parallel to the respective axes of the elongate apertures so that the first
20 frame section bordering each elongate aperture are similarly inclined to the axis of symmetry.

In an embodiment, the harness connectors are orientated upon the harness such that the distal end of each connector faces towards each other.

In an embodiment, the harness further comprises a bridge strap or rope which is coupled to one of the at least two second apertures or third aperture of one connector and a

corresponding aperture of the at least two second apertures or third aperture of the other connector.

In an embodiment, the harness further comprises a support (such as a padded lumbar support) which is coupled to the waist belt and a leg support (such as a padded leg support) which is coupled to each leg band.

In an embodiment, the waist belt and leg bands are adjustable via a respective buckle, so that the effective length of the belt and leg bands can be adjusted to suitably fit a user.

In an embodiment, the harness further comprises a plurality of attachment points located on the waist belt for detachably coupling climbing accessories. The attachment points may comprise loops or rings secured to the waist belt.

In an embodiment, the harness further comprises a sub-harness configured to provide anatomical support for the female pelvis.

Preferably the sub-harness comprises a first adjustable strap attached at an upper end to the face (eg the inside face) of a first end of the waist belt and a second adjustable strap attached at an upper end to the face (eg the inside face) of a second end of the waist belt. Particularly preferably the sub-harness further comprises an intermediate strap attached at an upper end to the rear face (eg exterior rear face) of the waist belt at substantially the mid-point. More preferably the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are convergent and coupled to the front exterior face of each of the leg bands by a coupling strap (eg a U-shaped coupling strap).

The lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be fixed (eg jointly fixed) to the coupling strap. For example, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be stitched (eg jointly stitched) to the coupling strap.

Preferably the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are connected freely (*eg* jointly connected freely) to the coupling strap. For example, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be looped on (*eg* jointly looped on) the coupling strap. By being
5 connected freely to the coupling strap, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap have greater articulation with (*eg* slidability on) the coupling strap to promote comfort.

In accordance with a third aspect of the present invention, there is provided a harness for supporting a female user in a suspended position, the harness comprising a waist belt for
10 extending around a user's waist and two leg bands configured to extend around a left and right leg of a user, a cradle for coupling the leg bands with the waist belt and a sub-harness configured to provide anatomical support for the female pelvis.

Preferably the sub-harness comprises a first adjustable strap attached at an upper end to the face (*eg* the inside face) of a first end of the waist belt and a second adjustable strap
15 attached at an upper end to the face (*eg* the inside face) of a second end of the waist belt. Particularly preferably the sub-harness further comprises an intermediate strap attached at an upper end to the rear face (*eg* exterior rear face) of the waist belt at substantially the mid-point. More preferably the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are convergent and coupled to the front exterior face of each of the
20 leg bands by a coupling strap (*eg* a U-shaped coupling strap).

The lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be fixed (*eg* jointly fixed) to the coupling strap. For example, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be stitched (*eg* jointly stitched) to the coupling strap.

Preferably the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are connected freely (*eg* jointly connected freely) to the coupling strap.

By being connected freely to the coupling strap, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap have greater articulation with (eg slidability on) the coupling strap to promote comfort. For example, the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap may be looped on
5 (eg jointly looped on) the coupling strap.

Typically the coupling strap is attached at a medial position of the front exterior face of each of the leg bands.

Whilst the invention has been described above, it extends to any inventive combination of features set out above or in the following description. Although illustrative embodiments of
10 the invention are described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to these precise embodiments.

Furthermore it is contemplated that a particular feature described either individually or as part of an embodiment can be combined with other individually described features, or parts of other embodiments, even if the other features and embodiments make no mention of the
15 particular feature. Thus the invention extends to such specific combinations not already described.

By way of example only, embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a front view of a harness according to a first embodiment of the present
20 invention fitted to a male user;

Figure 2 is a rear view of the harness illustrated in figure 1;

Figure 3 is a view of a harness connector according to an embodiment of the present invention;

Figure 4a is a front view of a harness according to a second embodiment of the present
25 invention suitable to be fitted to a female user; and

Figure 4b is a rear view of the harness illustrated in figure 4a.

Referring to Figures 1 and 2, there is illustrated a harness 10 according to a first embodiment of the present invention for supporting a male user when suspended from a rope or similar (not shown).

5 The harness 10 comprises a waist belt 20 comprising a webbing strap 21 (which may be formed of a polyester for example) which is arranged to extend around a user's waist and is adjustable via a buckle 22 so that the effective length of the waist belt 20 can be varied. The webbing strap 21 extends around an exterior of a lumbar support 23 so that (when fitted to a user) the lumbar support 23 extends between the webbing strap 21 and the user. The lumbar
10 support 23 may be padded and formed of a foamed material such as a polyethylene. A plurality of looped straps 24 through which the webbing strap 21 can extend secures the lumbar support 23 to the webbing strap 21. In an embodiment, the harness 10 further comprises a plurality of looped rope sections 25 and/or rings 26 secured around the waist belt 20. The looped sections 25 and rings 26 serve as attachment points for detachably coupled climbing
15 accessories such as quick draws (not shown), camming devices (not shown) or karabiners (not shown) to the harness 10.

 The harness 10 further comprises two leg bands 30, 40 or loops, which are separately arranged to extend around the thigh region of a users' legs. Each leg band 30, 40 comprises a fixing strap 31, 41 which may be similarly formed of a polyester, which is adjustable via a
20 respective buckle 32, 42 and a leg support 33, 43 which extends between the fixing strap 31, 41 and the users leg. The leg supports 33, 43 reduce the pressure exerted on the users legs from the fixing straps 31, 41 by distributing the force across a larger area compared with the fixing straps 31, 41 alone. The leg supports 33, 43 may be padded and similarly formed of a foamed material such as a polyethylene and further comprise a plurality of looped straps 34,
25 44 (only one of which is shown) similar to the lumbar support 23 through which the fixing straps 31, 41 can extend to secure the leg supports 33, 43 to the fixing straps 31, 41.

The harness 10 further comprises a cradle 50 which couples the leg supports 30, 40 to the waist belt 20, so that the waist belt 20 and leg supports 30, 40 can cooperate to support a user at multiple positions. The cradle 50 comprises two rear straps 51, 52 which extend between the waist belt 20 and the leg supports 30, 40 at a rear of the harness 10. Each rear strap 51, 52 comprises a belt portion 51a, 52a and a leg portion 51b, 52b. A proximal end of the belt portion 51a, 52a is rigidly coupled to the waist belt 20 (such as by stitching) and a proximal end of each leg portion 51b, 52b is rigidly coupled to a respective leg band 30, 40. The belt portion 51a, 52a and leg portion 51b, 52b of each rear strap 51, 52 are coupled together via a buckle 53, 54, so that the rise (namely the separation of the waist belt 20 from the leg bands 30, 40) can be varied.

The cradle 50 further comprises two front straps 55, 56 which similarly extend between the waist belt 20 and the leg supports 30, 40 at a front of the harness 10. Each front strap 55, 56 comprises a belt portion 55a, 56a and a leg portion 55b, 56b. A proximal end of the belt portion 55a, 56a is rigidly coupled to the waist belt 20 (such as by stitching) and a proximal end of each leg portion 55b, 56b is rigidly coupled to a respective leg band 30, 40. The belt portion 55a, 56a and leg portion 55b, 56b of each front strap 55, 56 are coupled together via a respective harness connector 100 as illustrated in Figure 3. In this respect, the harness 10 comprises two harness connectors 100 disposed at a front of the harness 10.

Referring to Figure 3, there is illustrated a harness connector 100 according to an embodiment of the present invention. The harness connector 100 is formed of a rigid material (such as a metal) and is preferably formed of a lightweight metal such as aluminium. The connector 100 comprises a first closed loop frame portion 110 which defines a first aperture 111. The connector 100 further comprises at least two second frame portions 120 rigidly coupled to the first frame portion 110 (or otherwise integrally formed therewith) disposed on opposing sides of the first frame 110 on an outer periphery thereof. The second frame portions 120 separately define a second aperture 121 having a substantially circular shape.

The connector 100 further comprises a bridging member 130 which extends across the first aperture 111 and is rigidly coupled at each end thereof with the first frame portion 110 or otherwise formed integrally therewith. The bridging member 130 extends across the first aperture 111 between the second frame portions 120. The member 130 defines a third aperture 131 at a central location thereof, which comprises a substantially circular shape. The at least two second apertures 121 and third aperture 131 are linearly aligned and extend along an axis 140 which is substantially transverse to a longitudinal, symmetric axis 150 of the connector 100.

The bridging member 13 separates the first aperture 111 into a proximal and distal aperture 112, 113, which extend at opposite sides of the bridging member 130. The proximal aperture 112 extends adjacent a proximal end of the aperture 111 which comprises a substantially linear portion 110a of the first frame portion 110. The distal aperture 113 extends adjacent a distal end of the connector 100 which comprises an arcuate portion 110b of the first frame 110. The arcuate portion 110b extends to opposite ends of the linear portion 110a such that the first frame portion 110 is substantially D-shaped.

The connector 100 further comprises a connecting member 160 which extends along the longitudinal axis 150 of the connector 100 between a central region of the linear portion 110a and the bridging member 130. The connecting member 160 is rigidly coupled to the linear portion 110a and bridging member 130 (or otherwise integrally formed therewith) and separates the proximal aperture 112 into two elongate apertures 114, 115 which are separately orientated along a respective axis. The elongate apertures 114, 115 are orientated at an acute angle to the longitudinal axis 150 and preferably diverge away from each other in a direction which is toward the distal end of the connector 100.

The first frame portion 110, at least two second frame portions 120, bridging member 130 and connecting member 160 extend in a common plane, such that the connector 100 is substantially planar. When incorporated within the harness 10 illustrated in Figures 1 and 2,

the belt portion 55a, 56a of each front strap 55, 56 is looped around the first frame portion 110 within an elongate aperture 114 of a connector 100, and the leg portion 55b, 56b of each front strap 55, 56 is looped around the first frame portion 110 within the adjacent elongate aperture 115 of the respective connector 100. The connectors 100 are orientated such that the distal end of each connector 100 extend toward each other and the divergent orientation of the elongate aperture 114, 115 of each connector accommodate the orientation of the belt portion 55a, 56a and leg portion 55b, 56b of each front strap 55, 56 and help centralise the connector 100 relative to the harness 10. The front straps 55, 56 may further comprise buckles 57, 58 or similar so that the effective length of the front straps 55, 56 and thus the separation of the waist belt 20 from the leg bands 30, 40 can be varied.

The harness 10 further comprises a rope bridge 60 which extends between the harness connectors 100. The rope bridge 60 comprises a short length of rope 61 or similar, one end of which is passed through one of the aligned circular apertures 121, 131 of one connector 100 and secured thereto. The other end of the rope 61 is passed through a corresponding circular aperture 121, 131 of the other connector 100 and secured thereto. During use, the rope bridge 60 serves as an attachment point for securing a rope (not shown), and may comprise a ring 62 or similar threaded thereon for facilitating the attachment of a rope (not shown) to the rope bridge 60 using a karabiner (not shown) or similar for suspending a user above the ground. The further aligned apertures 121, 131 provide additional attachment points for securing further rope bridges (not shown). The additional rope bridges enable arborists and the like to easily transfer between trees by coupling separate support ropes to the separate rope bridges. Moreover, the separate apertures 121, 131 enable rope bridges 60 to be secured therebetween having different lengths to provide differing degrees of freedom for the user when suspended. In addition, the distal aperture 113 of each connector 100 provides an easily accessible attachment point which is separate from the rope bridge(s) for securing additional ropes and lines to a user (such as during an emergency when it is required to rescue a user from an elevated, suspended position).

Figure 4a is a front view of a harness 400 according to a second embodiment of the present invention suitable to be fitted to a female user. Figure 4b is a rear view of the harness 400 illustrated in Figure 4a.

5 The harness 400 according to the second embodiment is largely identical to the harness 10 according to the first embodiment but is additionally equipped with a sub-harness 401. The sub-harness 401 generates anatomical support and comfort for the female pelvis and so the harness 400 is intended for female users.

10 The sub-harness 401 comprises a first adjustable strap 401a attached at an upper end to the inside face of a first end of the waist belt 20 and a second adjustable strap 401b attached at an upper end to the inside face of a second end of the waist belt 20. In use, the first adjustable strap 401a and second adjustable strap 401b are pulled tightly to give the harness 400 a snug fit. The sub-harness 401 further comprises an intermediate strap 402 attached at an upper end to the exterior rear face of the waist belt 20 at substantially the mid-point. Lower ends of the first adjustable strap 401a, the second adjustable strap 401b and the intermediate strap 402 are convergent and jointly coupled to the front exterior face of each of the right leg band 30 and the left leg band 40 by a U-shaped coupling strap 403.

15

From the foregoing therefore, it is evident that the harness and connector provide an improved support for climbers when operating at elevated positions.

CLAIMS

1. A harness connector comprising a closed loop first frame defining a first aperture, at least two closed loop second frames rigidly coupled to the first frame, each closed loop second frame defining a second aperture and a bridging member which extends across
5 the first aperture between the at least two second frames, the bridging member defining a third aperture nested within the first aperture, wherein the at least two second apertures and third aperture are linearly aligned.
2. A harness connector according to claim 1, wherein the bridging member separates the first aperture into a proximal aperture which extends adjacent a proximal end of the
10 connector and a distal aperture which extends adjacent a distal end of the connector.
3. A harness connector according to claim 1 or 2, wherein the first frame comprises a linear portion and an arcuate portion which extends to opposite ends of the linear portion.
4. A harness connector according to any preceding claim, wherein the first frame is
15 substantially D-shaped.
5. A harness connector according to any preceding claim, wherein the connector further comprises a connecting member which extends between a proximal end of the connector and the bridging member.
6. A harness connector according to claim 5, wherein the connecting member separates
20 the proximal aperture into two elongate apertures.
7. A harness connector according to claim 3, wherein the linear portion of the first frame extends along a proximal end of the connector and the arcuate portion extends along a distal end of the connector.
8. A harness connector according to any preceding claim, wherein the at least two second
25 apertures and third aperture are aligned along a first axis which extends substantially transverse to a second axis of the connector.

9. A harness connector according to claim 8, wherein the second axis is an axis of symmetry of the connector.
10. A harness connector according to claim 8 or 9, as appended to claim 5, wherein the connecting member extends along the second axis.
- 5 11. A harness connector according to claim 8 as appended to claim 6, wherein the elongate apertures extend along respective axes which are acutely orientated relative to the second axis.
12. A harness connector according to claim 11, wherein the respective axes diverge with respect to each other along the connector in a direction which is from a proximal end to a distal end of the connector.
- 10 13. A harness connector according to claim 5, wherein the first frame, at least two second frames, bridging member and connecting member extend in a common plane, such that the connector is substantially planar.
14. A harness connector according to any preceding claim, wherein the at least two second apertures and third aperture are substantially circular.
- 15 15. A harness connector according to claim 2, wherein the distal aperture is an arcuate aperture.
16. A harness connector according to any preceding claim, wherein the connector is formed of a rigid material.
- 20 17. A harness connector according to any preceding claim, wherein the connector is formed of aluminium.
18. A harness for supporting a user in a suspended position comprising a waist belt for extending around a user's waist, and two leg bands configured to extend around a left and right leg of a user, wherein the harness further comprises a cradle for coupling the leg bands with the waist belt, the cradle comprising at least two harness connectors according to any preceding claim.
- 25

19. A harness according to claim 18, wherein the harness connectors are disposed at a front of the harness so that the harness connectors extend at the front of a user during use.
20. A harness according to claim 18 or 19, wherein the cradle comprises a plurality of belt straps which extend between the waist belt and the harness connectors, and a plurality of band straps which extend between the leg bands and the harness connectors.
21. A harness according to claim 20, wherein a proximal end of the belt straps are rigidly coupled to the waist belt and a distal end of each belt strap is looped around the first frame through the first aperture of a separate connector.
22. A harness according to claim 20 or 21, wherein the cradle further comprises a plurality of buckles for adjusting the length of each belt strap.
23. A harness according to claim 22, wherein a proximal end of the band straps are rigidly coupled to the leg bands and a distal end of each band strap is looped around the first frame through the first aperture of a separate connector.
24. A harness according to claim 23, wherein the cradle further comprises a plurality of buckles for adjusting the length of each band strap.
25. A harness according to claim 20, wherein the belt straps and band straps are looped around the first frame through the proximal aperture.
26. A harness according to claim 25, wherein the belt straps and band straps are looped around the first frame through a separate elongate aperture of each connector.
27. A harness according to any of claims 18 to 26, wherein the harness connectors are orientated upon the harness such that the distal end of each connector faces towards each other.
28. A harness according to any of claims 18 to 27, further comprising a bridge strap or rope which is coupled to one of the at least two second apertures or third aperture of one connector and a corresponding aperture of the at least two second apertures or third aperture of the other connector.

29. A harness according to any of claims 18 to 28, further comprising a support which is coupled to the waist belt and a leg support which is coupled to each leg band.

30. A harness according to any of claims 18 to 29, wherein the waist belt and leg bands are adjustable via a respective buckle so that the effective length of the belt and leg bands can be varied.

31. A harness according to any of claims 18 to 30, further comprising a plurality of attachment points located on the waist belt for detachably coupling climbing accessories.

32. A harness according to any of claims 18 to 30 further comprising a sub-harness configured to provide anatomical support for the female pelvis.

33. A harness according to claim 32 wherein the sub-harness comprises a first adjustable strap attached at an upper end to the inside face of a first end of the waist belt and a second adjustable strap attached at an upper end to the inside face of a second end of the waist belt.

34. A harness according to claim 33 wherein the sub-harness further comprises an intermediate strap attached at an upper end to the exterior rear face of the waist belt at substantially the mid-point.

35. A harness according to claim 34 wherein lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are convergent and jointly coupled to the front exterior face of each of the leg bands by a coupling strap.

36. A harness according to claim 34 or 35 wherein the lower ends of the first adjustable strap, the second adjustable strap and the intermediate strap are connected freely to the coupling strap

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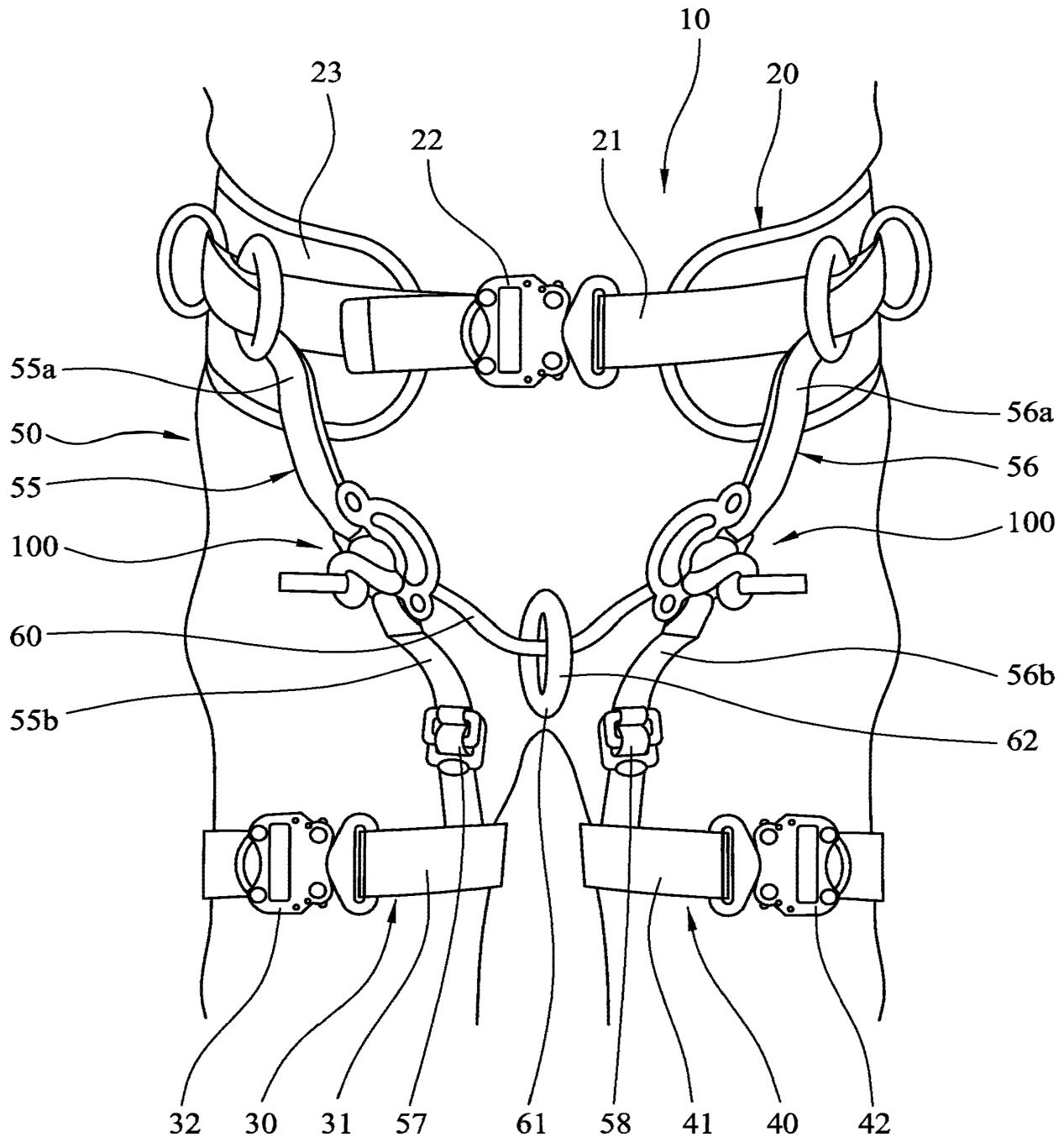
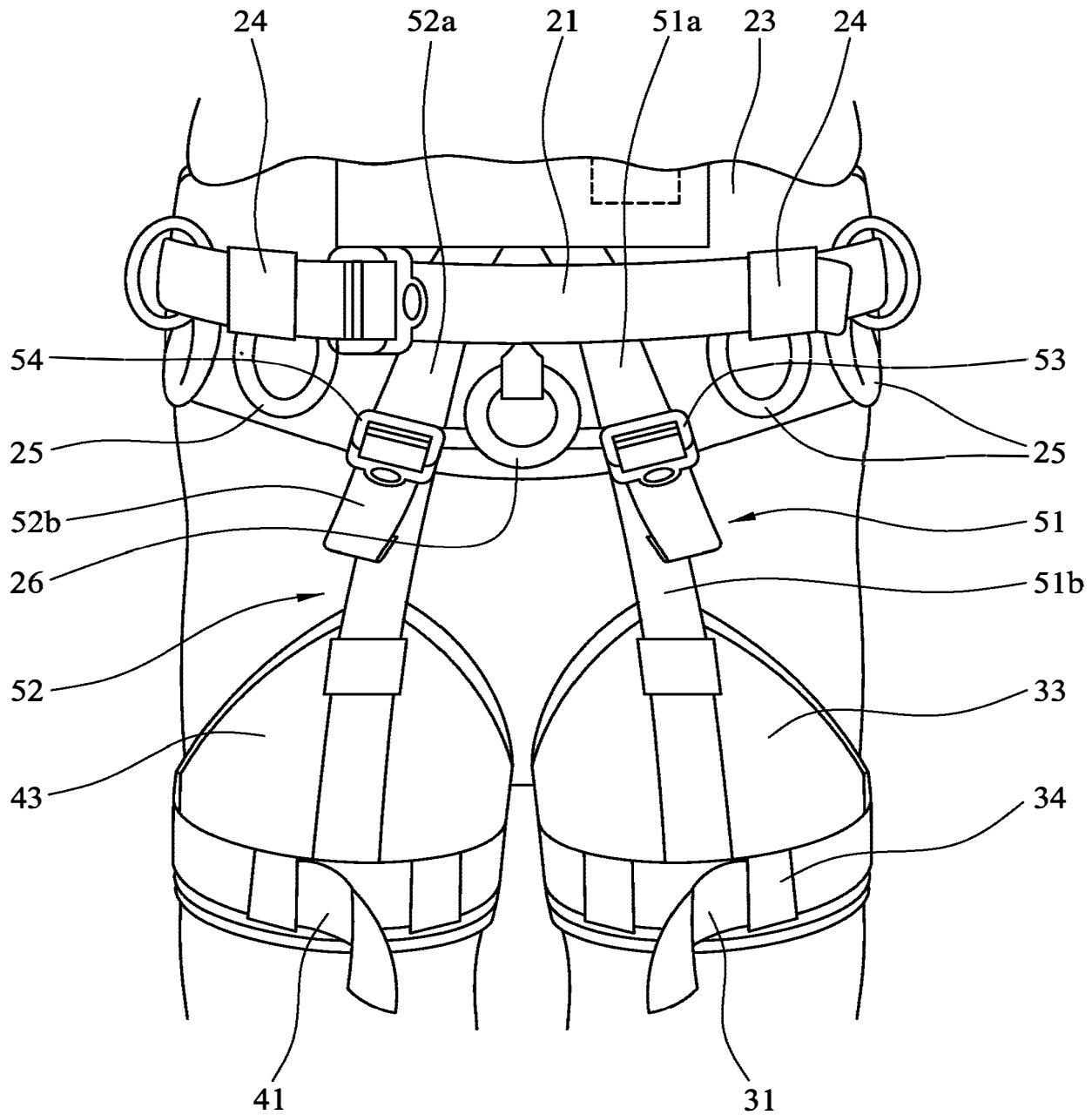
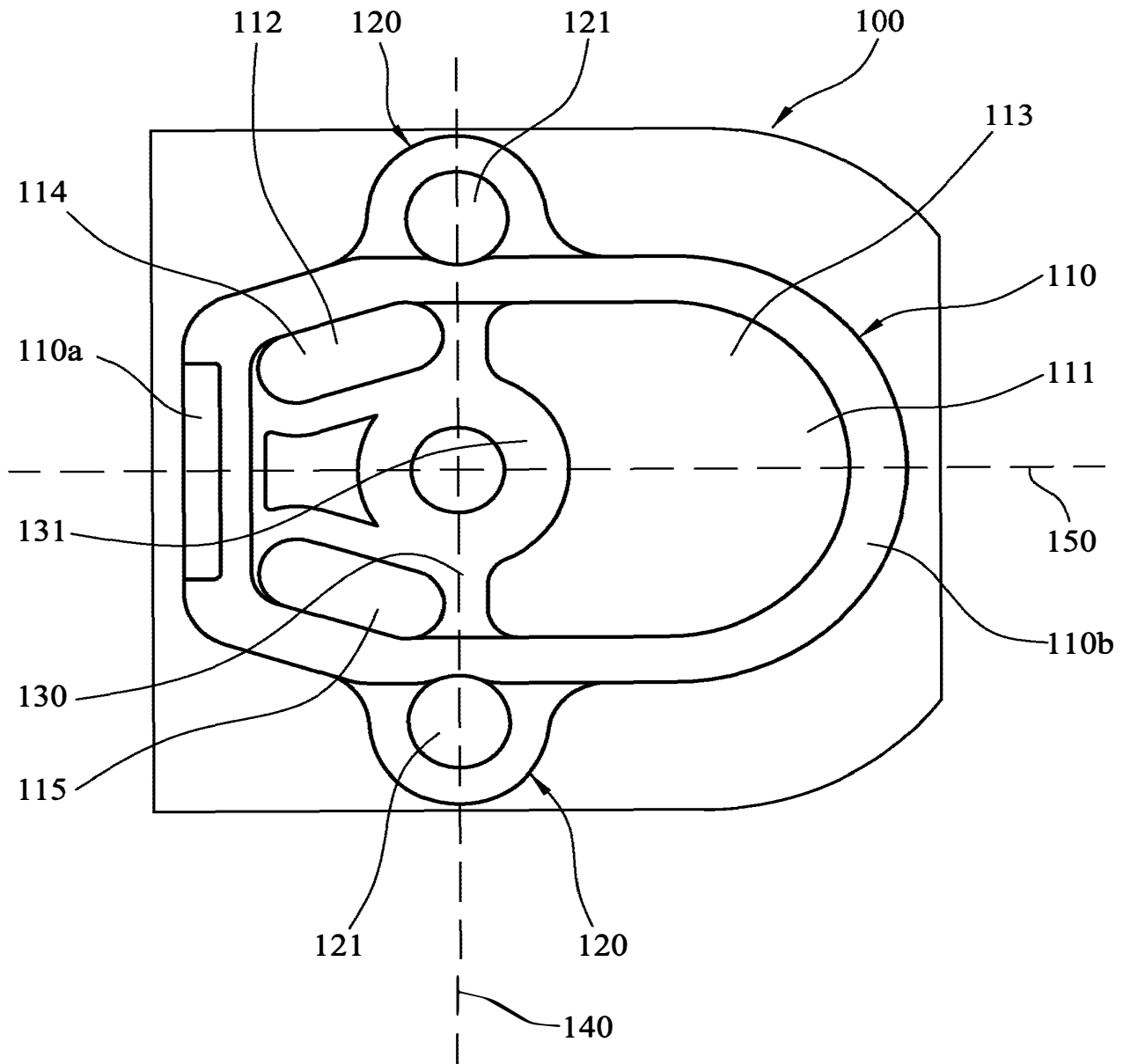


Figure 1

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Figure 2

-3/4-

Figure 3

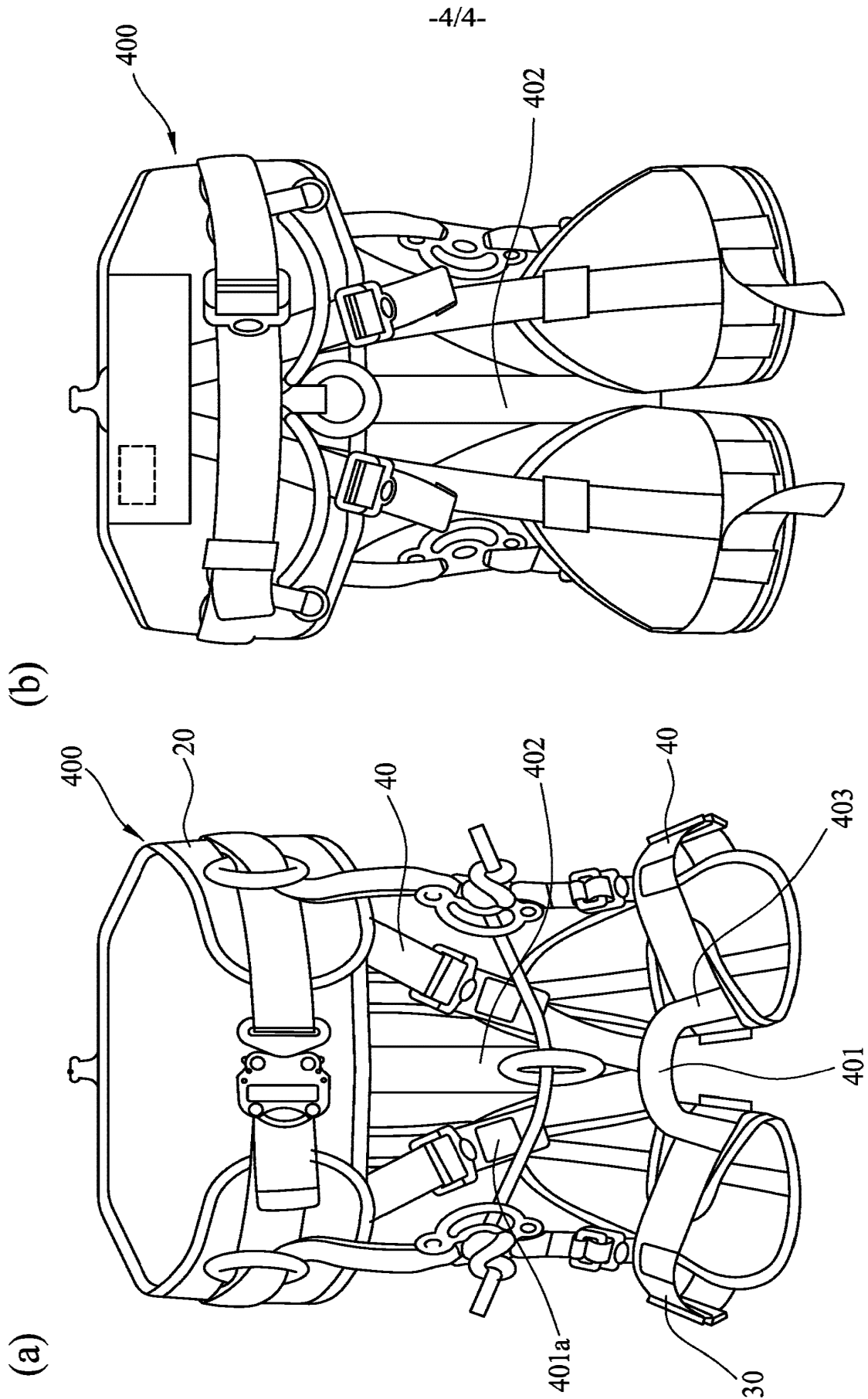


Figure 4

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2017/052664

A. CLASSIFICATION OF SUBJECT MATTER

INV. A62B35/00

ADD. A63B27/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A62B A63B

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 8 333 262 B1 (CARPENTER AMANDA [US] ET AL) 18 December 2012 (2012-12-18) column 4, lines 20-38 column 6, line 62 - column 7, line 22 column 7, line 61 - column 8, line 15 column 8, lines 36-65 column 9, lines 4-44 figures 1-7 ----- -/--	1-4,8,9, 14-25, 27-31 5-7, 10-13, 26,32-36



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

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Date of the actual completion of the international search

20 November 2017

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2017/052664

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	column 2, lines 54-65 column 2, lines 36-46 column 3, lines 8-30 column 4, lines 2-15 column 4, lines 34-38 figures 1-5	3,4,6,7, 10-12, 14,15, 19-29, 31-36
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2017/052664

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 8333262	B1	18-12-2012	US 8333262 B1	18-12-2012
			US 9486654 B1	08-11-2016

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

(54) Title: HARNESS WITH INTEGRATED ENERGY ABSORBER

(57) Abstract: A fall protection harness for being removably worn by a user having at least two leg straps, a first shoulder strap and a second shoulder strap. At least one of the shoulder straps has an energy absorbing element integrated therewith. The energy absorbing element may be a tubular webbing material surrounding a tearable webbing material with at least two bound webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold.

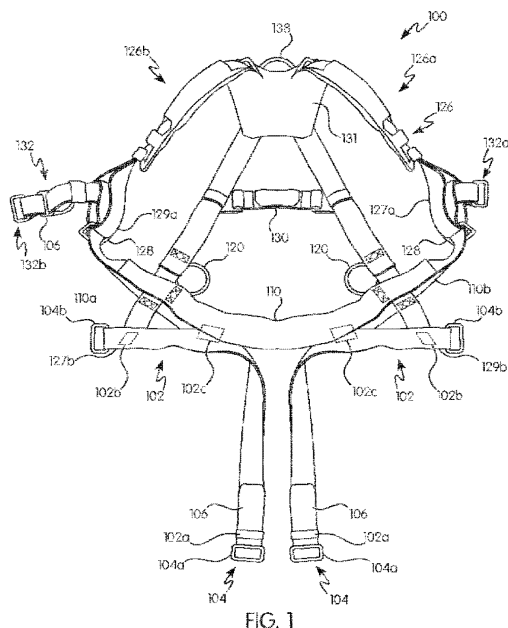


FIG. 1

Published:

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

HARNESS WITH INTEGRATED ENERGY ABSORBER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Utility Application No. 15/376,233, filed December 12, 2016 entitled “Harness with Integrated Energy Absorber” the disclosure of which is incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates generally to a fall protection harness and, in particular, to a fall protection harness having an integrated energy absorber.

Description of the Related Art

[0003] As is known in the art, there exist various safety devices and arrangements that can be worn by or attached to a user to ensure the wearer’s safety in certain situations. Such mechanisms come in many forms, including, but not limited to, harnesses and safety belts. Full body harnesses are widely used for lifting and lowering individuals in dangerous situations and as a primary component in a personal fall arrest system. These harnesses can also be used for work positioning, travel restriction, ladder climbing, rescue retrieval, and evacuation. While these harnesses are used mainly in an industrial setting, and particularly the construction industry where the likelihood and danger of falls from heights is both numerous and significant, a full body harness can be used in various other applications in which total suspension and support of the body must be ensured, either expectedly or unexpectedly.

[0004] While there are many variations in full body harness construction, all typically include a plurality of elongate straps that are combined together to fit around a user’s body. In some embodiments or aspects, a full body harness may have an attachment point (D-ring) typically positioned in a central portion of the user’s back, and a plurality of straps routed around predetermined portions of the user’s body in such a manner as to hold or suspend the user in the event of a fall.

[0005] Full body harnesses, when used in a personal fall arrest system, must always be used with an energy absorbing element. In some embodiments or aspects, the energy absorbing element may be a self-retracting lanyard (SRL), and in other embodiments or aspects may include a lanyard or a rope grab. The SRL is attached at one end to an anchor point and at its other end to a line

directly connected to the user. The SRL is configured to activate once the user has begun to fall to arrest the fall soon enough to prevent injury to the user. Typically, an SRL has a housing with a rotatable drum having a line wound about the drum and a braking mechanism for controlling the rotation of the drum. The drum can rotate in a first direction to unwind (or “pay out”) the line from the housing when a certain level of tension is deliberately applied. When tension is reduced or released, the drum can slowly rotate in a reverse direction, thereby causing the line to retract or rewind onto the drum. The braking mechanism is configured for slowing down and stopping the rotation of the drum when the line unwinds too rapidly. For example, the braking mechanism may be activated to brake the rotation of the drum when the rotation speed exceeds a predetermined velocity. A sudden line pay out at a speed that exceeds normal payout is an indication that the user has experienced a fall that needs to be stopped or arrested. Should such an unintentional, accidental fall commence, the braking mechanism in the housing of the SRL is configured to engage and stop the user from falling too far.

[0006] Many falls occur over the edge of a working surface, causing the line of the SRL to bend over the edge. In such situations, the line is not moved relative to the edge, thereby imparting the entire force of a fall on a single point in the line at the edge. If an energy absorbing element is not positioned between the user and the edge, there is a risk that the user will be exposed to dangerously high forces caused by a sudden deceleration of the user’s body as the user’s weight is supported by the harness and a line attaching the user to the anchor point. Some full body harnesses have an energy absorbing element permanently attached to the D-ring on the user’s back. This design, however, is often bulky and can interfere with the user’s mobility. It also adds additional weight that the user must carry at all times.

[0007] Accordingly, there is a need in the art for an improved harness that addresses certain drawbacks and deficiencies associated with known harnesses. For example, there is a need for an improved harness with an improved energy absorbing element associated with the harness. There is a further need in the art for an improved harness that can be easily and effectively worn by the user in a variety of work environments without compromising the user’s ability to move and without adding additional weight that must be borne by the user. There is also a need for an improved harness with increased safety compliance at the worksite, and with more effective and safe support of the user in the event of a fall.

SUMMARY OF THE INVENTION

[0008] Generally, provided is an improved fall protection harness having an integrated energy absorbing element. Preferably, provided is an improved harness having an energy absorbing element, such as a tearable webbing material. Preferably, provided is an improved harness that can be easily and effectively worn by the user in a variety of work environments without compromising the user's ability to move and without adding significant weight that must be borne by the user. Preferably, provided is an improved harness that not only leads to increased safety compliance at the worksite, but also provides increased effectiveness to the personal fall protection system and a resulting increase in the safety of the user in the event of a fall.

[0009] In some preferred and non-limiting embodiments or aspects, provided is a wearable harness having a plurality of straps, optionally including a first leg strap and a second leg strap, each leg strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The harness may optionally further include a belt strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The harness includes a shoulder strap having a first shoulder strap, and a second shoulder strap. One or both of the first shoulder strap and the second shoulder strap may have an energy absorbing element integrated therewith. The energy absorbing element may have a tubular webbing encasing a tearable webbing material with at least two bound (e.g., load-bearing) webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold. Accordingly, the energy absorbing element may be integrated on or with at least a portion of at least one of the shoulder straps.

[0010] In other preferred and non-limiting embodiments or aspects, the energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap. The energy absorbing element may be exposed from the tubular webbing through an opening in the tubular webbing. The opening may be a slit formed at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap. At least a portion of the energy absorbing element may be configured to exit through the opening of the tubular

webbing upon tearing. The tubular webbing may be made from a woven tubular material. The tubular webbing may be made from a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.

[0011] In other preferred and non-limiting embodiments or aspects, the at least two bound webbing components may be bound by a plurality of binder threads or an adhesive. The plurality of binder threads may be configured to tear successively in a longitudinal direction of at least one of the first shoulder strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subject to the force that exceeds the predetermined threshold. The plurality of binder threads may extend through at least a portion of a thickness of the at least two webbing components. The plurality of binder threads may be arranged in a row, or two or more rows extending along a longitudinal length or a lateral length of the webbing components. The rows may be substantially parallel to each other or intersect with each other at least once over the longitudinal length or the lateral length of the webbing components. The plurality of binder threads may be arranged in two or more thread groups spaced apart from each other along a longitudinal length or a lateral length of the webbing components. The two or more thread groups may be arranged in a pattern. A density of the plurality of binder threads may increase from the rear portion to the front portion of the shoulder strap, or vice versa. The predetermined threshold may be in the range of about 310 lbs to about 2,250 lbs. The first shoulder strap and the second shoulder strap may have a starting tear area at the rear portion where the pair of bound webbing components is unbound. The first shoulder strap and the second shoulder strap may have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components. The energy absorbing element may be located on an energy absorbing area at the rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0012] In other preferred and non-limiting embodiments or aspects, at least one connector may be arranged on at least one of the plurality of straps and configured to facilitate removable attachment of the free floating ends of at least one of the plurality of straps. The connector may be at least one of the following: a clip, a buckle, a mating arrangement, an attachment structure, or any combination thereof. The first end of each leg strap may be adjustably attached to the second end by a connection mechanism that can adjust the length of each leg strap. The harness may have a chest strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The first end of the chest strap may be

attached to the first shoulder strap and the second end of the chest strap may be attached to the second shoulder strap. The harness may have a back strap connecting a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0013] In other preferred and non-limiting embodiments or aspects, a fall protection harness removably wearable by a user may have a plurality of straps, including an optional first leg strap, an optional second leg strap, and an optional belt strap. The fall protection harness includes a first shoulder strap and a second shoulder strap. One or both of the first shoulder strap and the second shoulder strap may have an energy absorbing element integrated therewith, the energy absorbing element comprising a tubular webbing encasing a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are subjected to a predetermined force. The energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0014] In other preferred and non-limiting embodiments or aspects, the first shoulder strap and the second shoulder strap may have a starting tear area at the rear portion where the pair of bound webbing components is unbound. The energy absorbing element may be located on an area at the rear portion of at least one of the first shoulder strap and the second shoulder strap. At least one connector may be arranged on at least one of the plurality of straps and configured to facilitate removable attachment of free floating ends of at least one of the plurality of straps. The connector may be at least one of the following: a clip, a buckle, a mating arrangement, an actuatable structure, or any combination thereof. The first end of each leg strap may be adjustably attached to the second end by a connection mechanism to adjust a length of each leg strap. The harness may have a chest strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The first end of the chest strap may be attached to the first shoulder strap and the second end of the chest strap may be attached to the second shoulder strap.

[0015] In other preferred and non-limiting embodiments or aspects, at least one strap of a harness may have a shoulder strap having tubular webbing encasing an energy absorbing element

having a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the shoulder strap when the shoulder strap is subjected to a predetermined force. The energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of the shoulder strap. In a harness removably attachable to a body of a user, at least one strap may have an energy absorbing element integrated with the at least one strap.

[0016] Further preferred and non-limiting embodiments or aspects will now be set forth in the following numbered clauses.

[0017] Clause 1: A wearable harness having a plurality of straps comprising: an optional first leg strap, an optional second leg strap, an optional belt strap, a first shoulder strap, and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap comprises an energy absorbing element integrated therewith.

[0018] Clause 2: The harness of claim 1, wherein the energy absorbing element is a tubular webbing encasing a tearable webbing material with at least two bound webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold.

[0019] Clause 3: The harness of clause 1 or 2, wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0020] Clause 4: The harness of any of clauses 1-3, wherein the energy absorbing element is exposed from the tubular webbing through an opening in the tubular webbing.

[0021] Clause 5: The harness of any of clauses 1-4, wherein at least a portion of the energy absorbing element is configured to exit through the opening of the tubular webbing upon tearing.

[0022] Clause 6: The harness of any of clauses 1-5, wherein the tubular webbing comprises a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.

[0023] Clause 7: The harness of any of clauses 1-6, wherein the at least two bound webbing components are bound by a plurality of binder threads.

[0024] Clause 8: The harness of any of clauses 1-7, wherein the plurality of binder threads are configured to tear successively in a longitudinal direction of at least one of the first shoulder

strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subjected to the force that exceeds the predetermined threshold.

[0025] Clause 9: The harness of any of clauses 1-8, wherein the plurality of binder threads extend through at least a portion of a thickness of the at least two webbing components.

[0026] Clause 10: The harness of any of clauses 1-9, wherein the plurality of binder threads are arranged in two or more substantially parallel or intersecting rows extending along a longitudinal length or a lateral length of the webbing components.

[0027] Clause 11: The harness of any of clauses 1-10, wherein the plurality of binder threads are arranged in two or more thread groups spaced apart from each other along a longitudinal length or a lateral length of the webbing components.

[0028] Clause 12: The harness of any of clauses 1-11, wherein the predetermined threshold is about 310 lbs to about 2,250 lbs.

[0029] Clause 13: The harness of any of clauses 1-12, wherein the at least two bound webbing components are bound together by an adhesive.

[0030] Clause 14: The harness of any of clauses 1-13, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the pair of bound webbing components is unbound.

[0031] Clause 15: The harness of any of clauses 1-14, wherein the first shoulder strap and the second shoulder strap have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components.

[0032] Clause 16. The harness of any of clauses 1-15, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0033] Clause 17: A fall protection harness removably wearable by a user, the harness having a plurality of straps comprising: an optional first leg strap an optional second leg strap, an optional belt strap, a first shoulder strap, and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap have an energy absorbing element integrated therewith, the energy absorbing element comprising a tubular webbing encasing a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are

subjected to a predetermined force, and wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0034] Clause 18: The harness of clause 17, wherein the first end of each leg strap is adjustably attached to the second end by a connection mechanism to adjust a length of each leg strap.

[0035] Clause 19: The harness of clause 17 or clause 18, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0036] Clause 20: In a harness removably attachable to a body of a user and having at least one strap comprising an energy absorbing element integrated with the at least one strap.

[0037] These and other features and characteristics of the present disclosure, as well as the methods of operation and functions of the related elements of structures and the combination of parts and economies of manufacture, will become more apparent upon consideration of the following description and the appended claims with reference to the accompanying drawings, all of which form a part of this specification, wherein like reference numerals designate corresponding parts in the various figures. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] **FIG. 1** is a front view of a harness in accordance with the principles of the present invention;

[0039] **FIG. 2** is a detailed perspective view of a shoulder harness having an energy absorbing element in accordance with the principles of the present invention;

[0040] **FIG. 3A** is a schematic representation of the energy absorbing element in a first configuration;

[0041] **FIG. 3B** is a schematic representation of the energy absorbing element in a second configuration;

[0042] **FIG. 4A** is a side cross-sectional view of an energy absorbing element in accordance with the principles of the present invention;

[0043] FIG. 4B is a top view of an energy absorbing element in accordance with the principles of the present invention; and

[0044] FIG. 4C is a top view of an energy absorbing element in accordance with the principles of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0045] For purposes of the description hereinafter, the terms “end”, “upper”, “lower”, “right”, “left”, “vertical”, “horizontal”, “top”, “bottom”, “lateral”, “longitudinal” and derivatives thereof shall relate to the invention as it is oriented in the drawing figures. However, it is to be understood that the invention may assume various alternative variations and step sequences, except where expressly specified to the contrary. It is also to be understood that the specific devices and processes illustrated in the attached drawings, and described in the following specification, are simply exemplary embodiments of the invention. Hence, specific dimensions and other physical characteristics related to the embodiments disclosed herein are not to be considered as limiting.

[0046] As used in the specification and the claims, the singular form of “a”, “an”, and “the” include plural referents unless the context clearly dictates otherwise. As used in the specification and the claims, the term “end” refers to the extreme distal portion or the area near or adjacent that portion. Unless otherwise specified, the use of the term “attach”, “attachable”, and/or “attachment” includes a permanent, semi-permanent, removable, or adjustable attaching arrangement. As used in the specification and the claims, the term “integrated”, when used with reference to an energy absorbing element and any portion of a harness, means that an energy absorbing element is formed as a separate component or arrangement and can be combined in, on, or with at least a portion of a separately formed harness (e.g., at least one strap or portion of a strap of the harness), such that the two components together constitute a whole. Therefore, the terms “therewith”, “therein”, and “thereon” are used interchangeably in the context of the present description. As used in the specification and the claims, the term “substantially parallel” means a relative angle as between two objects (if extended to theoretical intersection), such as elongated objects and including reference lines, that is from 0° to 5°, or from 0° to 3°, or from 0° to 2°, or from 0° to 1°, or from 0° to 0.5°, or from 0° to 0.25°, or from 0° to 0.1°, inclusive of the recited values.

[0047] As used in the specification and the claims, all ranges or ratios disclosed herein are to be understood to encompass any and all subranges or sub-ratios subsumed therein. For aspect or

embodiment, a stated range or ratio of “1 to 10” should be considered to include any and all subranges between (and inclusive of) the minimum value of 1 and the maximum value of 10; that is, all sub-ranges or sub-ratios beginning with a minimum value of 1 or more and ending with a maximum value of 10 or less, such as but not limited to, 1 to 6.1, 3.5 to 7.8, and 5.5 to 10.

[0048] In various preferred and non-limiting embodiments or aspects, and with reference to **FIGS. 1-3B**, the present disclosure is directed to a harness **100** used in a fall protection system. As discussed herein, the harness **100** has at least one structural energy absorbing element integrated therewith and made from a tearable webbing material configured for absorbing energy during a fall event. In various preferred and non-limiting embodiments or aspects, the harness **100** may be used in combination with a supplementary energy absorbing element, such as a self-retracting lanyard (SRL) (not shown), to provide additional energy absorption during a fall event.

[0049] With continued reference to **FIG. 1**, the harness **100** has at least two leg straps **102** configured to attach around a user's legs below a user's groin area. When attached, the leg straps **102** loop around or encircle each of the user's legs. Each leg strap **102** has a first end **102a** that is removably attachable to a second end **102b** via a connector **104**. In some preferred and non-limiting embodiments or aspects, the connector **104** may be a clip, a buckle, a mating arrangement, an actuatable structure, or the like. The connector **104** permits removable attachment of the first end **102a** to the second end **102b** of each leg strap **102**. In this manner, the first and second ends **102a**, **102b** of the leg straps **102** are configured to be removably attached to each other and configured to be free floating when detached from each other. In some preferred and non-limiting embodiments or aspects, at least one connector **104** and/or the leg strap **102** may have at least one connection mechanism **106** configured for adjusting the length of each leg strap **102**. In this manner, the at least one connection mechanism **106** adjusts a distance between the first end **102a** and the second end **102b** such that each leg strap **102** may be adjusted to fit comfortably around the user's legs. Each leg strap **102** may be formed from a substantially flat webbing material typically used in harness construction.

[0050] In various preferred and non-limiting embodiments or aspects of the present disclosure, the leg straps **102** (or, indeed, any of the straps in the harness **100**) may be linear lengths of material, folded straps that form loops with the at least one connector **104** at the first end **102a** and/or the second end **102b**, or the like. For example, as shown in **FIG. 1**, the connector **104** may have a first portion **104a** that is non-adjustably attached to the first end **102a** of at least one leg

strap **102**, while a second portion **104b** of the connector **104** is adjustably secured at the second end **102b** of at least one leg strap **102** through a loop of the material that makes up the leg strap **102**. Therefore, in such an arrangement, the second portion **104b** of the connector **104** and the loop of material that makes up the leg strap **102** at the second end **102b** defines the at least one connection mechanism **106** for adjusting a length of the leg strap **102**. It should be noted that the position of the connection mechanism **106** may be reversed such that the second portion **104b** of the connector **104** is provided on the first end **102a** of the leg strap **102**. At least one leg strap **102** may have padding (not shown) for increasing the user's comfort while wearing the harness **100**.

[0051] With continued reference to **FIG. 1**, each leg strap **102** is connected to a belt strap **110** at a substantially intermediate portion **102c** of the leg strap **102** between the first end **102a** and the second end **102b**. For example, each leg strap **102** may be connected to the belt strap **110**. In some preferred and non-limiting embodiments or aspects, the substantially intermediate portion **102c** of the leg strap **102** may be directly and non-movably connected to the belt strap **110**, such as being sewn directly to the belt strap **110**. In other preferred and non-limiting embodiments or aspects, the substantially intermediate portion **102c** of each leg strap **102** may be connected to the rear end of the belt strap **110** by a connection strap (not shown) to allow the substantially intermediate portion **102c** of the leg strap **102** to slidably move along a front portion of the leg strap **102**. Accordingly, the position of the leg straps **102** may be adjusted relative to the belt strap **110** to increase the user's comfort while wearing the harness **100**.

[0052] The belt strap **110** is configured to encircle at least a portion of the user's torso. The belt strap **110** has a first end **110a** that is attached to a first portion of a shoulder strap **126** and a second end **110b** that is attached to a second portion of the shoulder strap **126**. The first end **110a** and the second end **110b** may be removably or non-removably attachable to the shoulder strap **126**. In some embodiments or aspects, at least one of the first end **110a** and the second end **110b** may be attachable to the shoulder strap **126** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. In some preferred and non-limiting embodiments or aspects, the belt strap **110** may have at least one connection mechanism **106** configured for adjusting the length of the belt strap **110**. In this manner, the at least one connection mechanism **106** adjusts a distance between the first end **110a** and the second end **110b** such that the belt strap **110** may be adjusted to fit comfortably around the user's torso. One or more handle connection members, and other handling and/or connectors **120** may be provided on at least a portion of the

belt strap **110**. The belt strap **110** may have padding (not shown) for increasing the user's comfort while wearing the harness **100**. The belt strap **110** may be formed from a substantially flat webbing material typically used in harness construction.

[0053] With continued reference to **FIG. 1**, the harness **100** further has the shoulder strap **126** configured to extend over at least a portion of the user's shoulders. The shoulder strap **126** may have a first shoulder strap **126a** and a second shoulder strap **126b** arranged to overlap one another in an X-shaped configuration. In some preferred and non-limiting embodiments or aspects, the shoulder strap **126** may have at least one shoulder pad **131** having one or more openings through which the first shoulder strap **126a** and the second shoulder strap **126b** can be arranged to maintain the first shoulder strap **126a** and the second shoulder strap **126b** in the X-shaped configuration.

[0054] With specific reference to **FIG. 1**, the first shoulder strap **126a** has a first end **127a** that is connected to the second end **110b** of the belt strap **110**. The first end **127a** of the first shoulder strap **126a** may be removably or non-removably attachable to the second end **110b** of the belt strap **110**. In some preferred and non-limiting embodiments or aspects, the first end **127a** of the first shoulder strap **126a** may be attached to the second end **110b** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The first shoulder strap **126a** further has a second end **127b** that is connected to one of the two leg straps **102**. In some preferred and non-limiting embodiments or aspects, the second end **127b** of the first shoulder strap **126a** is connected to the leg strap **102** proximate to the second end **102b** of the leg strap **102**, such as by being sewn directly to the leg strap **102**. The first shoulder strap **126a** may have at least one loop **128** through which the first end **110a** of the belt strap **110** may be passed. At least a portion of the first shoulder strap **126a** may be formed from a substantially flat webbing material typically used in harness construction.

[0055] With continued reference to **FIG. 1**, the second shoulder strap **126b** has a first end **129a** that is connected to the first end **110a** of the belt strap **110**. The first end **129a** of the second shoulder strap **126b** may be removably or non-removably attachable to first end **110a** of the belt strap **110**. In some embodiments or aspects, the first end **129a** of the second shoulder strap **126b** may be attached to the first end **110a** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The second shoulder strap **126b** further has a second end **129b** that is connected to the other of the two leg straps **102**. In some preferred and non-limiting embodiments or aspects, the second end **129b** of the second shoulder strap **126b**

is connected to the leg strap **102** proximate to the second end **102b** of the leg strap **102**, such as by being sewn directly to the leg strap **102**. The second shoulder strap **126b** may have at least one loop **128** through which the second end **110b** of the belt strap **110** may be passed. At least a portion of the second shoulder strap **126b** may be formed from a substantially flat webbing material typically used in harness construction.

[0056] As shown in **FIG. 1**, the harness **100** may have a back strap **130** connecting a substantially intermediate portion of the first shoulder strap **126a** between its first end **127a** and second end **127b** with a substantially intermediate portion of the second shoulder strap **126b** between its first end **129a** and second end **129b**. A position of the back strap **130** may be adjustable along a longitudinal direction of each the first shoulder strap **126a** and the second shoulder strap **126b**, such as by sliding the back strap **130** along the first shoulder strap **126a** and/or the second shoulder strap **126b**.

[0057] The harness **100** further may have a chest strap **132** having a first end **132a** removably connectable to a second end **132b**. The first end **132a** of the chest strap **132** may be positioned proximate to the first end **127a** of the first shoulder strap **126a**, while the second end **132b** of the chest strap **132** may be positioned proximate to the first end **129a** of the second shoulder strap **126b**. The first end **132a** of the chest strap **132** is removably attachable to the second end **132b** via a connector, similar to the connector **104** described herein with reference to the leg straps **102**. In some preferred and non-limiting embodiments or aspects, the connector **104** may be a clip, a buckle, a mating arrangement, an actuatable structure, or the like. In this manner, the first and second ends **132a**, **132b** of the chest strap **132** are configured to be removably attached to each other and configured to be free floating when detached from each other. In some preferred and non-limiting embodiments or aspects, at least one of the back strap **130** and the chest strap **132** may have at least one connection mechanism, such as the connection mechanism **106** described herein with reference to the leg straps **102**. The connection mechanism **106** is configured for adjusting the length of the back strap **130** and/or the chest strap **132**. The back strap **130** and the chest strap **132** may be formed from a substantially flat webbing material typically used in harness construction.

[0058] With reference to **FIG. 2**, the shoulder strap **126** has an anchor element, such as a D-ring **138**, for connecting at least a portion of the shoulder strap **126** to a line connected to an anchor point. In some preferred and non-limiting embodiments or aspects, at least a portion of the first

shoulder strap **126a** and the second shoulder strap **126b** is looped around or otherwise permanently attached to the D-ring **138**. The D-ring **138** has a frame **140** defining at least one opening through which the first shoulder strap **126a** and the second shoulder strap **126b** may be looped around. In some preferred and non-limiting embodiments or aspects, the frame **140** of the D-ring **138** has a first opening **142** through which the first shoulder strap **126a** and the second shoulder strap **126b** extend. The D-ring further has a second opening **144** which may be used to secure the clip, such as a carabiner, of a lanyard or other rope or line between the harness **100** and the anchor point (or secure other items to the harness **100**).

[0059] In some preferred and non-limiting embodiments or aspects, the shoulder strap **126** has an energy absorbing element integrated therewith. In one preferred and non-limiting embodiment or aspect, at least one of the first shoulder strap **126a** and the second shoulder strap **126b** may be constructed from a tearable webbing material, such as an energy absorbing tear tape that is encased within a tubular webbing. In another preferred and non-limiting embodiment, and with reference to **FIG. 3A**, both the first shoulder strap **126a** and the second shoulder strap **126b** are made from a substantially flat webbing material **146** that is encased within a tubular webbing **147**. The substantially flat webbing material **146** may be completely encased within the tubular webbing **147**, except at a substantially intermediate portion of the first shoulder strap **126a** and the second shoulder strap **126b**, where at least a portion of the substantially flat webbing material **146** may be exposed (and exit) from the tubular webbing **147**. Of course, this exposure or exit point or area may be at any point along the length of the first shoulder strap **126a** and the second shoulder strap **126b**.

[0060] In some preferred and non-limiting embodiments or aspects, the substantially flat webbing material **146** may be exposed from the tubular webbing **147** through an opening **149** in the tubular webbing **147** in an area where the substantially flat webbing material **146** is connected to the D-ring **138**. As described herein, a first portion of the substantially flat webbing material **146** from each of the first shoulder strap **126a** and the second shoulder strap **126b** may be connected directly to the D-ring **138**, while a second portion of the substantially flat webbing material **146** bypasses the D-ring **138**. In this manner, the harness **100** does not differ externally from a conventional harness without the energy absorbing element, but incorporates the beneficial energy absorption element integrated into the harness **100**.

[0061] With reference to **FIGS. 3A-3B**, the first shoulder strap **126a** is illustrated. The second shoulder strap **126b** is omitted for simplicity of illustration. While the illustration of the second shoulder strap **126b** is omitted from **FIGS. 3A-3B**, construction and operation of the second shoulder strap **126b** is identical to that of the first shoulder strap **126a** in the embodiment or aspect where both shoulder straps **126a**, **126b** incorporate the tubular webbing **147** and/or energy absorbing element. Each of the first shoulder strap **126a** and a second shoulder strap **126b** may have the tubular webbing **147** arranged to overlap one another in an X-shaped configuration. The tubular webbing **147** of the first shoulder strap **126a** may have a first end that corresponds with the first end **127a** of the first shoulder strap **126a** (shown in **FIG. 1**). The first end of the tubular webbing **147** may be connected to the second end **110b** of the belt strap **110** in a removably or non-removably attachable manner. In some preferred and non-limiting embodiments or aspects, the first end of the tubular webbing **147** may be attachable to the second end **110b** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The tubular webbing **147** further has a second end that corresponds to the second end **127b** of the first shoulder strap **126a** (shown in **FIG. 1**). The second end of the tubular webbing **147** may be connected to one of the two leg straps **102** in a removably or non-removably attachable manner. The tubular webbing **147** may be formed from webbing material that is woven into a tubular shape, or from flat webbing material wherein opposite lateral ends of the substantially flat webbing material are connected together to form the tubular shape of the tubular webbing **147**.

[0062] In various examples, the tubular webbing **147** may have an internal diameter of about 0.5 inches to about 2.0 inches. In various embodiments or aspects, a longitudinal length of the tubular webbing **147** may be between about 24 inches to about 90 inches. The opening **149** in the tubular webbing **147** may be formed at a substantially intermediate point between the first end **127a** and the second end **127b** of the first shoulder strap **126a** (and/or the second shoulder strap **126b**). In some preferred and non-limiting embodiments or aspects, the opening **149** may be formed at a rear portion of the harness **100** at an upper portion of a user's back. In this manner, the opening **149** allows the substantially flat webbing material **146** to be exposed such that the substantially flat webbing material **146** may be connected to the D-ring **138**. The opening **149** may be formed as a slit in the tubular webbing **147** having a length between about 0.5 inches to about 2.0 inches. In one preferred and non-limiting embodiment, and upon activation of the energy absorbing element, e.g., the flat webbing material **146**, at least a portion of the energy absorbing

element is configured to exit through the opening **149** of the tubular webbing **147** upon tearing, thereby facilitating the complete (if necessary) separation of the flat webbing material **146**. Further, it is envisioned that the opening **149** may be reinforced wholly or partially around its edges to ensure that the tubular webbing **147** does not rip or tear during a fall event.

[0063] With continued reference to **FIGS. 3A-3B**, the substantially flat webbing material **146** of the first shoulder strap **126a** has two webbing components **146a**, **146b** (which may be load-bearing webbing components) that are woven together by binder threads **148**. In some embodiments or aspects, the webbing material **146** may have a plurality of load-bearing webbing components. The webbing components **146a**, **146b** may each be typically made from a two ply webbing material constructed from high tenacity polyester or nylon yarns. Each webbing component **146a**, **146b** may have a face ply and a back ply. The webbing components **146a**, **146b** may be superimposed over one another such that the back ply of one of the webbing components **146a**, **146b** is positioned over the face ply of the other of the webbing components **146a**, **146b**. The webbing components **146a**, **146b** and the binder threads **148** are woven together to constitute a single-piece webbing material, i.e., the first shoulder strap **126a** and the second shoulder strap **126b**. While the present disclosure describes binder threads **148** as a means of integrally bonding the webbing components **146a**, **146b** together, other suitable bonding means, such as hook-and-loop fasteners, adhesives, or other energy absorbing materials may also be used, either individually or in combination with the binder threads **148**.

[0064] When the energy absorbing element is activated, such as during a fall event, the binder threads **148** are configured to be torn upon experiencing a force in excess of a predetermined force, thereby allowing the two webbing components **146a**, **146b** to tear apart from each other, such as shown in **FIG. 3B**. In some embodiments or aspects, the predetermined force (load) may be in the range of about 310 lbs to about 2,250 lbs. The binder threads **148** are configured to absorb energy (force) of a user falling during a fall event by fracturing (or tearing/separating) and allowing the webbing components **146a**, **146b** to separate from each other. The tearing of the binder threads **148** may be initiated by a minimum predetermined force (load), such as about 310 lbs. The tearing of the binder threads **148**, and a consequent separation of the webbing components **146a**, **146b** continues as long as the force on the harness **100** exceeds the minimum predetermined force and ends when either (1) the webbing components **146a**, **146b** reach an ending point; or (2) the force reduces to a point below the minimum predetermined force. In various embodiments or aspects,

the shoulder strap **124** may be configured to tear the webbing components **146a**, **146b** apart from each other due to breaking of the binder threads **148** at a constant force. The minimum predetermined force (load) required to break the binder threads **148** may be configurable by increasing or decreasing the density of the binder threads **148** per unit area, increasing or decreasing the width of the shoulder strap **124**, increasing or decreasing the density of the binder threads **148** along a longitudinal length and/or a lateral length of the shoulder strap **124**, and/or selecting a type of thread having specified strength characteristics.

[0065] As discussed above, and in another preferred and non-limiting embodiment or aspect, the webbing components **146a**, **146b** may be bound together by an adhesive, such as glue, that separates when reaching the minimum predetermined force or load. It is recognized that these adhesives may be specifically formulated to meet the separation requirements at the minimum predetermined force or load.

[0066] With reference to **FIG. 4A**, the binder threads **148** may extend through at least a portion of a thickness of at least one of the webbing components **146a**, **146b**. For example, the binder threads **148** may extend between the face ply and the back ply of each of the webbing components **146a**, **146b**. In some embodiments or aspects, such as shown in **FIG. 4A**, the binder threads **148** extend through the entire thickness of each of the webbing components **146a**, **146b**. With reference to **FIG. 4B**, the binder threads **148** may be woven in two or more rows **153** extending along a longitudinal length and/or a lateral length of the webbing components **146a**, **146b**. In various preferred and non-limiting embodiments or aspects, the rows **153** may be substantially parallel to each other, or intersect at least once with each other along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**. With reference to **FIG. 4C**, the binder threads **148** may be arranged in a plurality of thread groups **151** arranged in a pattern on the webbing components **146a**, **146b**. In some preferred and non-limiting embodiments or aspects, the density of thread groups **151** may be constant along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**. In this manner, the webbing components **146a**, **146b** will separate from one another due to breaking of the binder threads **148** at a constant rate at a given force that exceeds the minimum predetermined force. In other preferred and non-limiting embodiments or aspects, the density of thread groups **151** may vary along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**, such as by increasing or decreasing the density of the thread groups **151**. Accordingly, the webbing components **146a**,

146a will separate from one another due to breaking of the binder threads **148** at an increasing or decreasing rate at a given force that exceeds the minimum predetermined force. The arrangement of the thread groups **151** may be selected to optimize the tear-away force required to break the binder threads **148** (or adhesive) during separation of the webbing components **146a**, **146b** from each other. In various preferred and non-limiting embodiments or aspects, the binder threads **148** extend continuously between the webbing components **146a**, **146b** in a sinusoidal manner. The binder threads **148** may be made from high tenacity polyester yarns, nylon, or other suitable materials. The tensile strength of the binder threads **148** is desirably selected to be less than that of the webbing components **146a**, **146b** to allow the binder threads **148** to tear without tearing the webbing components **146a**, **146b**.

[0067] With reference to **FIG. 3A**, the first shoulder strap **126a** may have a starting tear point **150** at which the two webbing components **146a**, **146b** are not bound by the binder threads **148**. The starting tear point **150** may be defined at a substantially intermediate portion of the first shoulder strap **126a** between the first end **127a** and the second end **127b**. After the starting tear point **150**, the webbing components **146a**, **146b** are integrally woven together. With reference to **FIG. 3B**, as the user falls during a fall event, the binder threads **148** start to fracture (or tear) at the starting tear point **150** and continue tearing along the longitudinal length of an energy absorbing area **152** of the shoulder strap **126** that ties the webbing components **146a**, **146b** with the binder threads **148**. The binder threads **148** are configured to tear successively along the longitudinal length of the bound absorbing area **152** beginning from the starting tear point **150**. The successive tearing of the binder threads **148** absorbs energy of the fall, thereby safely decelerating the user and reducing the shock transferred to the user's body as the user's weight is borne by the harness. Further, at least a portion of the webbing components **146a**, **146b** exit from the tubular webbing **147** through the opening **149**.

[0068] With continued reference to **FIG. 3B**, the first shoulder strap **126a** may have an ending tear point **154** at an end of the energy absorbing area **152**. The ending tear point **154** may have a reinforced area **156**, such as by additional stitching, to prevent further tearing of the webbing components **146a**, **146b**. Once activated, the two webbing components **146a**, **146b** support the user's weight, such as with one of the webbing components **146a**, **146b** being connected to the D-ring **138**, and the other of the two webbing components **146a**, **146b** supporting the user's shoulders. The tearing of the two webbing components **146a**, **146b** due to breaking of the binder

threads **148** may end prior to the ending tear point **154** if the force on the harness is reduced below the minimum predetermined force necessary to tear the binder threads **148**.

[0069] The shoulder strap **126** having an energy absorbing element integrated therewith, such as the two webbing components **146a**, **146b** bound by binding threads **148**, reduces the risk of misuse, especially in leading edge applications where the user may incorrectly attach an integrated energy absorbing element to a conventional harness. A harness **100** having such a shoulder strap **126** eliminates the need for a structural back-up strap as the tear tape maintains the static strength of structural webbing at full elongation (end of deployment shown in **FIG. 5C**). In this manner, the harness **100** does not differ externally from a conventional harness without the energy absorbing element, but incorporates the beneficial energy absorption element integrated into the harness **100**.

[0070] Although the invention has been described in detail for the purpose of illustration based on what is currently considered to be the most practical and preferred embodiments, it is to be understood that such detail is solely for that purpose and that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover modifications and equivalent arrangements that are within the spirit and scope of the appended claims. For example, it is to be understood that the present invention contemplates that, to the extent possible, one or more features of any embodiment can be combined with one or more features of any other embodiment.

What is claimed is:

1. A wearable harness having a plurality of straps comprising:
a first shoulder strap and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap comprises a tubular webbing; and
an energy absorbing element integrated with at least one of the first shoulder strap and the second shoulder strap,
wherein the energy absorbing element is at least partially encased within the tubular webbing and comprises a tearable webbing material with at least two bound webbing components configured to tear from one another when the first shoulder strap and the second shoulder strap are subjected to a force that exceeds a predetermined threshold during a fall event.
2. The harness of claim 1, wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.
3. The harness of claim 1, wherein the energy absorbing element is exposed from the tubular webbing through an opening in the tubular webbing.
4. The harness of claim 3, wherein at least a portion of the energy absorbing element is configured to exit through the opening of the tubular webbing upon tearing.
5. The harness of claim 1, wherein the tubular webbing comprises a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.
6. The harness of claim 1, wherein the at least two bound webbing components are bound by a plurality of binder threads.

7. The harness of claim 6, wherein the plurality of binder threads are configured to tear successively in a longitudinal direction of at least one of the first shoulder strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subjected to the force that exceeds the predetermined threshold.

8. The harness of claim 6, wherein the plurality of binder threads extend through at least a portion of a thickness of the at least two webbing components.

9. The harness of claim 6, wherein the plurality of binder threads are arranged in two or more substantially parallel or intersecting rows extending along a longitudinal length or a lateral length of the webbing components.

10. The harness of claim 6, wherein the plurality of binder threads are arranged in two or more thread groups arranged in a pattern and spaced apart from each other along a longitudinal length or a lateral length of the webbing components.

11. The harness of claim 1, wherein the predetermined threshold is in a range of about 310 lbs to about 2,250 lbs.

12. The harness of claim 1, wherein the at least two bound webbing components are bound together by an adhesive.

13. The harness of claim 1, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the pair of bound webbing components is unbound.

14. The harness of claim 1, wherein the first shoulder strap and the second shoulder strap have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components.

15. The harness of claim 1, wherein the energy absorbing element is located on an energy absorbing area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

16. A fall protection harness removably wearable by a user, the harness having a plurality of straps comprising:

a first shoulder strap and a second shoulder strap comprising a tubular webbing, wherein at least one of the first shoulder strap and the second shoulder strap have an energy absorbing element integrated therewith and at least partially encased within the tubular webbing, the energy absorbing element comprising a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are subjected to a predetermined force during a fall event, and

wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

17. The harness of claim 16, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the at least two bound webbing components are unbound.

18. The harness of claim 16, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

19. In a harness removably attachable to a body of a user and having at least one strap comprising:

an energy absorbing element integrated with the at least one strap, wherein the energy absorbing element is at least partially encased with a tubular webbing of the at least one strap and comprises a tearable webbing material with at least two

bound webbing components configured to tear from one another when the at least one strap is subjected to a force that exceeds a predetermined threshold during a fall event.

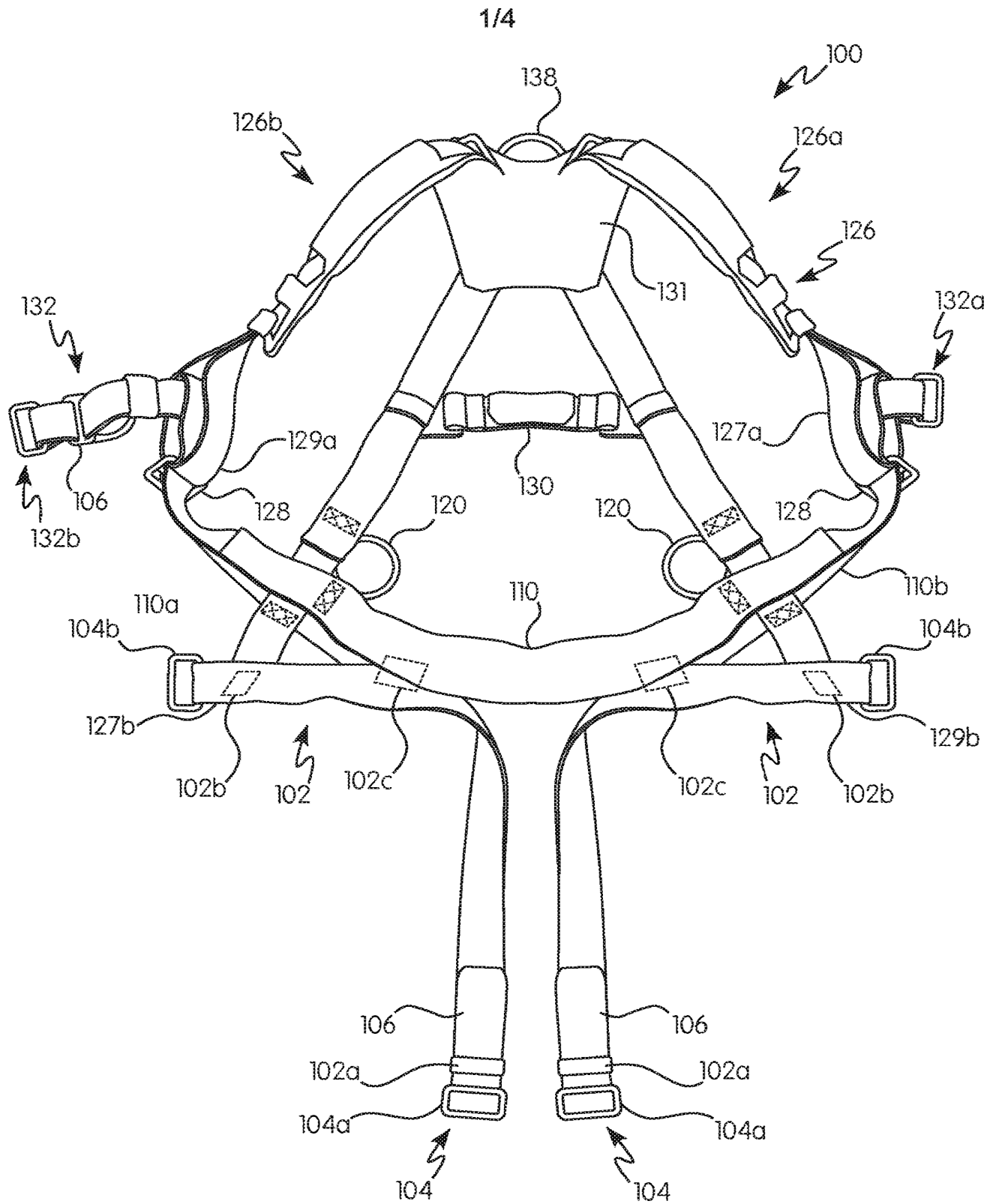


FIG. 1

2/4

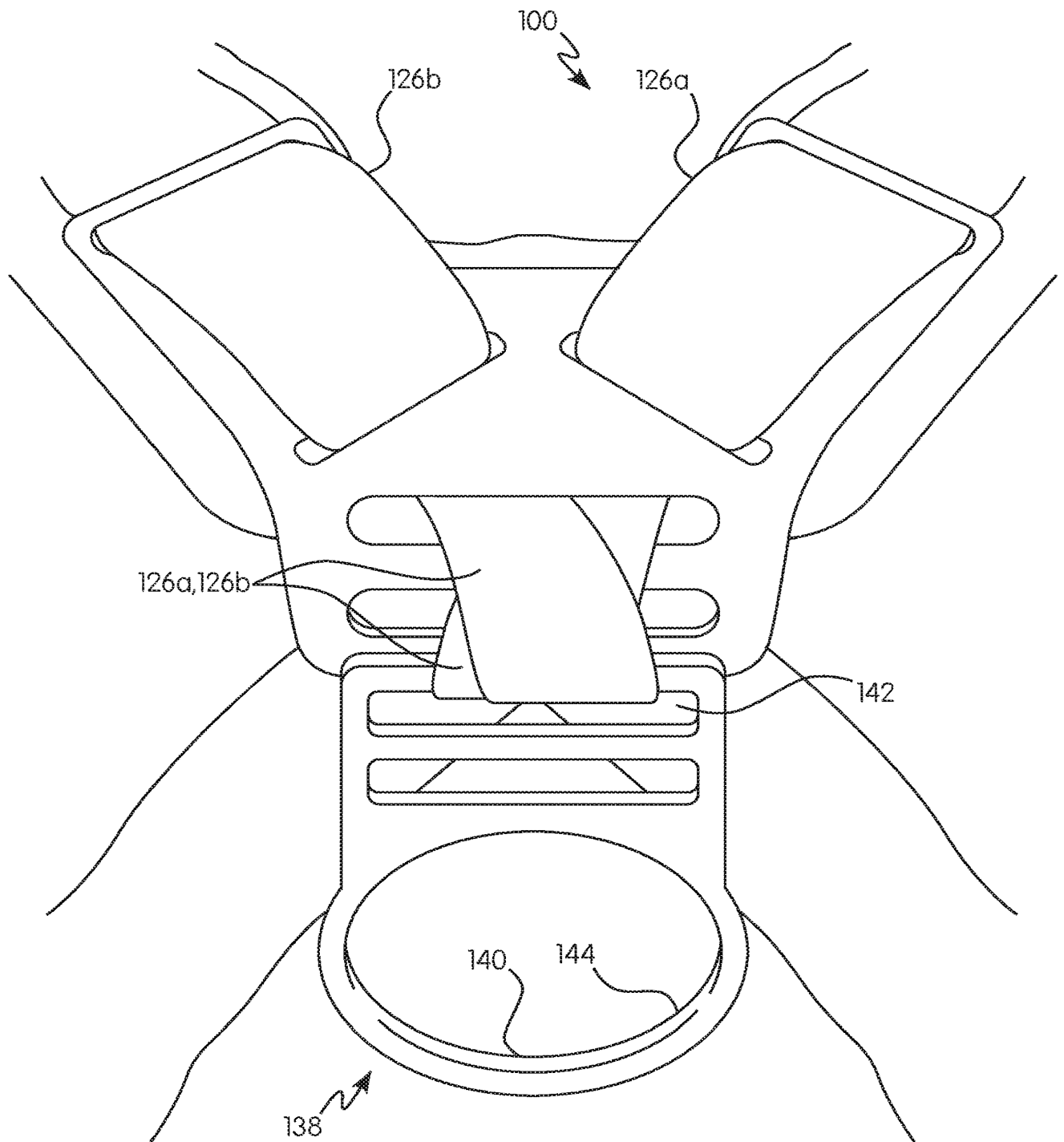


FIG. 2

3/4

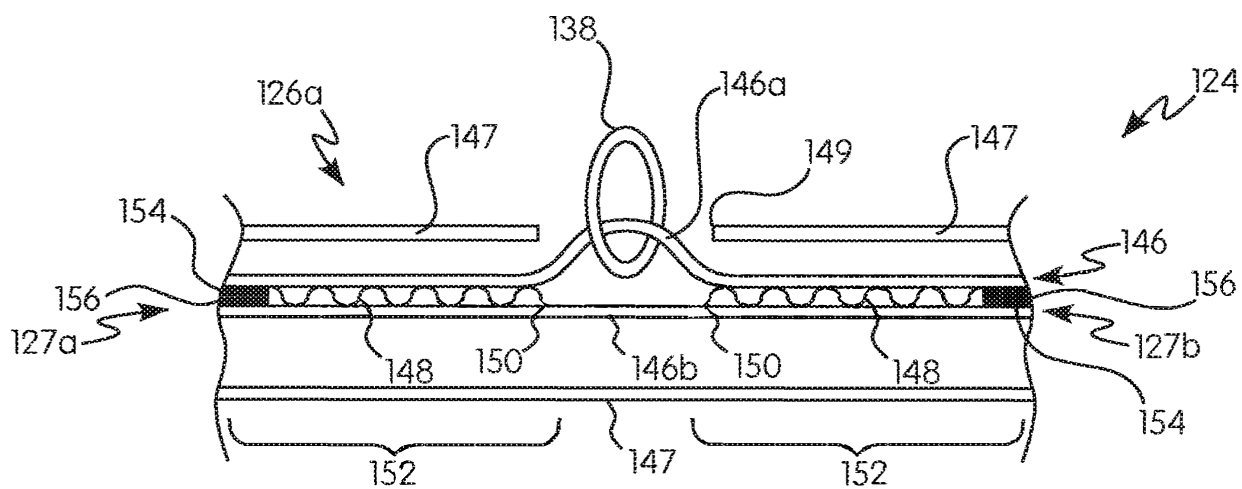


FIG. 3A

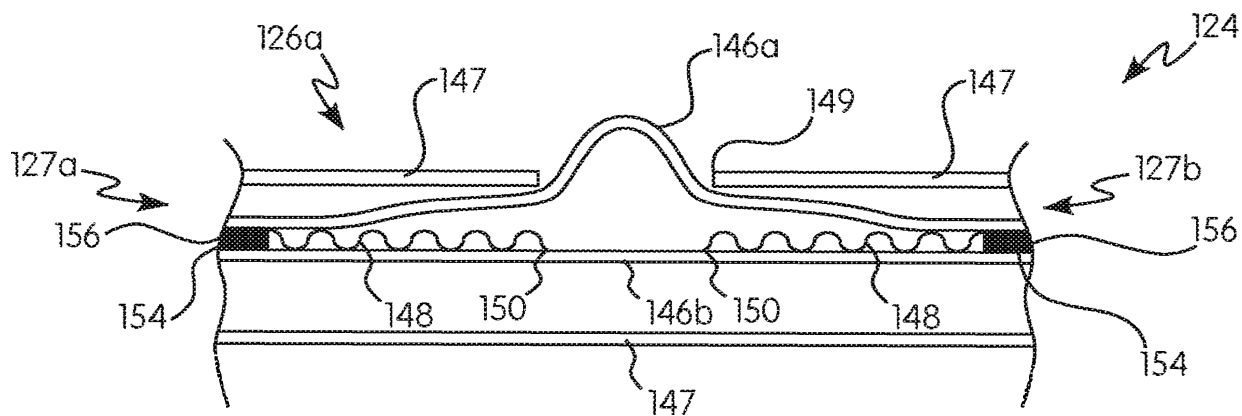


FIG. 3B

4/4

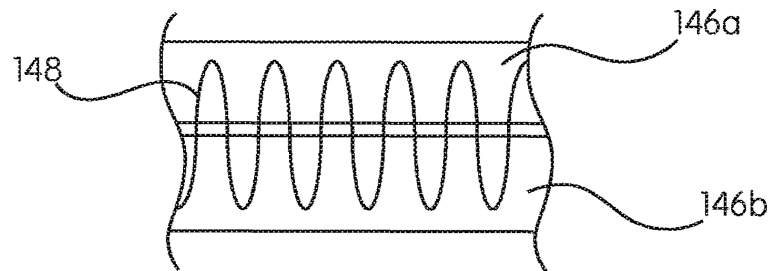


FIG. 4A

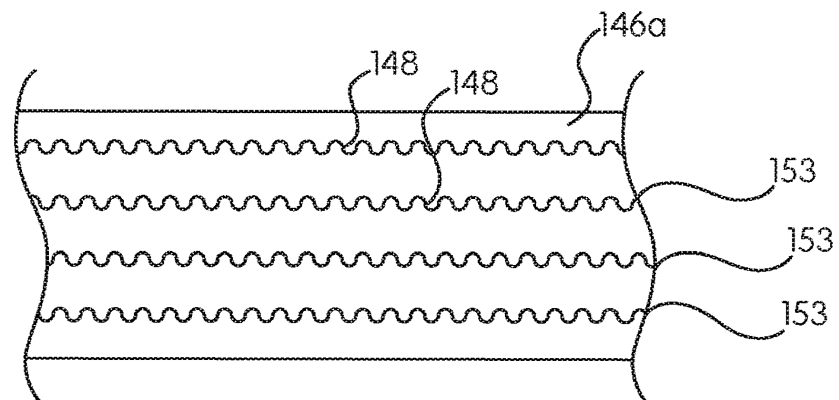


FIG. 4B

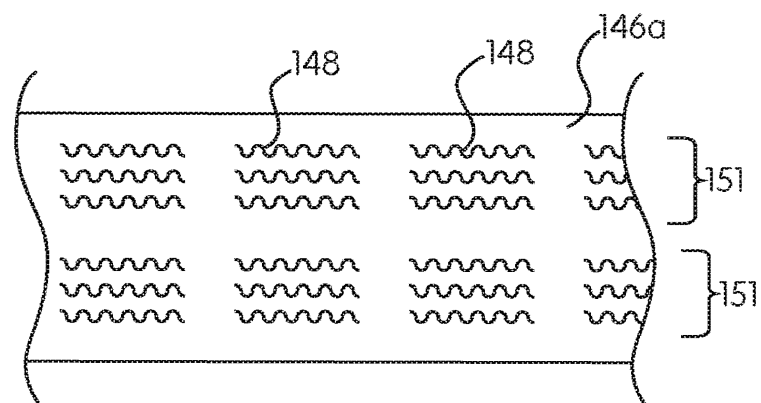


FIG. 4C

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/064684

A. CLASSIFICATION OF SUBJECT MATTER

INV. A62B35/00 A62B35/04
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A62B

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 8 584 799 B1 (DENNINGTON MARK [US]) 19 November 2013 (2013-11-19) figures -----	19 1-18

☐

Further documents are listed in the continuation of Box C.

☒

See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

13 February 2018

Date of mailing of the international search report

20/02/2018

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040.
Fax: (+31-70) 340-3016

Authorized officer

Andlauer, Dominique

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/064684

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8584799	B1	19-11-2013	NONE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number

Filing Date

First Named Inventor

Walter Ernest Power II

Art Unit

Examiner Name

Attorney Docket Number

TETH143.03

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	8061479		2011-11-22	Harris Jr.	
	2	8292028		2012-10-23	Wise	
	3	8356691		2013-01-22	Griffith	
	4	8584799		2013-11-19	Dennington	
	5	9320925		2016-04-26	Wise	
	6	9808659		2017-11-07	Chevalier	
	7	10258814		2019-04-16	Casebolt	
	8	11504556		2022-11-22	Power II	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Walter Ernest Power II	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	TETH143.03	

	9	11964175		2024-04-23	Power II	
	10	5699657		1997-12-23	Paulson	
	11	11771931		2023-10-03	Leach	
	12	8333262		2012-12-18	Carpenter	
	13	7063185		2006-06-20	Green	
	14	7909137		2011-03-22	Green	
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	17	2252998		1941-08-19	Wachtel	
	18	4962929		1990-10-16	Melton Jr.	
	19	6712181		2004-03-30	Nichols	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

	20	5010850		1991-04-30	Sailer	
	21	4347914		1982-09-07	Gary	
	22	11534633		2022-12-27	Cowell	
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	24	5970697		1999-10-26	Jacobs	
	25	2600395		1952-06-17	Joseph	
	26	7107749		2006-09-19	Wetzels	
	27	5699657		1997-12-23	Paulson	
	28	11850452		2023-12-26	Power II	
	29	11351405		2022-06-07	Power II	
	30	9003579		2015-04-14	Pinholster Jr.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Walter Ernest Power II		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	TETH143.03		

	31	10918194		2021-02-16	Conlin	
	32	11511141		2022-11-29	Kim	

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U.S.PATENT APPLICATION PUBLICATIONS
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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	20080179136		2008-07-31	Griffith	
	2	20090255756		2009-10-15	Green	
	3	20080000719		2008-01-03	Jones	
	4	20190301089		2019-10-03	DE SOUSA	
	5	20210101032		2021-04-08	Power II	
	6	20230173312		2023-06-08	Gregoire, Jr.	
	7	20220249886		2022-08-11	Leach	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

8	20050139419		2005-06-30	Green	
9	20210038929		2021-02-11	Vitt	
10	20170291047		2017-10-12	Bouquier	
11	20120393998		2021-12-23	Cowell	
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15	20200039808		2020-12-20	Power II	
16	20060207828		2006-09-21	D'Acquisto	
17	20080000719		2008-01-03	Jones	
18	20100162882		2010-07-01	Shakespeare	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Walter Ernest Power II		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	TETH143.03		

	19	20190134438		2019-05-09	Liggett	
	20	20190210696		2019-07-11	Barnes	
	21	20210076666		2021-03-18	Power II	
	22	20220249886		2022-08-11	Leach	
	23	20220241624		2022-08-04	Jarusiewicz	
	24	20230094095		2023-03-30	Armstrong	
	25	20240352671		2024-10-24	Heins	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	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	WO2018111624	WO		2018-06-21	Jacob		☐
	2	WO2018051068	WO		2018-03-22	Griffith		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

	3	EP1932565	EP		2008-06-18	Dussenne		☐
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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		☐

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EXAMINER SIGNATURE

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	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

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	/brendandix/	Date (YYYY-MM-DD)	2025-07-30
Name/Print	Brendan B. Dix	Registration Number	37,313

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.



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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/671,581

RECEIPT DATE / TIME
03/25/2025 10:53:38 AM Z ET

ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

PATENT # -

CONFIRMATION # 5913

FILED BY Brendan Dix

PATENT CENTER # 69721042

FILING DATE 05/22/2024

CUSTOMER # 44088

FIRST NAMED
INVENTOR Walter Ernest Power II

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY -

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
petition-request.pdf	2	ePetition Request Form	31 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
petition-request.pdf	17E66F4061222E7694CAC1EA6159FE0579BC8CA08F56F91E9 7CD09087FB3414ED549D0B24CBE14669F9AD501C6A336C684 D6776C1D475603A78EF162D659614B

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.



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PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)

APPLICATION #	FIRST NAMED INVENTOR	ATTORNEY DOCKET #	FILING DATE
18671581	Walter Power	TETH143.03	05/22/2024

Title of Invention

Bridge Rope Assembly

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the office notice or action plus any extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

(1) Petition fee under 37 CFR 1.17(m) is attached

Applicant claims the following entity status

Small

(2) Reply and/or fee

A non-final rejection has been issued in this application. The following reply is permitted in the electronic format. I certify, in accordance with 37 CFR 1.4(d)(4) that the response has already been filed in the above-identified application on 12/10/2024

(3) Terminal disclaimer is not required since the electronic petition format does not support design applications and applications filed before June 8, 1995. Please file using an alternative petition format for review by Office of Petitions

Statement



The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(a) was unintentional.

Petitioner is reminded that a delay resulting from a deliberately chosen course of action on the part of the applicant does not become an "unintentional" delay within the meaning of 37CFR 1.137 because:

- the applicant does not consider the claims to be patentable over the references relied upon in an outstanding Office action;
- the applicant does not consider the allowed or patentable claims to be of sufficient breadth or scope to justify the financial expense of obtaining a patent;
- the applicant does not consider any patent to be of sufficient value to justify the financial expense of obtaining the patent; or
- the applicant remains interested in eventually obtaining a patent, but simply seeks to defer patent fees and

patent prosecution expenses.

Petitioner is further reminded that an intentional delay resulting from a deliberate course of action chosen by the applicant is not affected by:

- the correctness of the applicant's (or applicant's representative's) decision to abandon the application or not to seek or persist in seeking revival of the application;
- the correctness or propriety of a rejection, or other objection, requirement, or decision by the Office; or
- the discovery of new information or evidence, or other change in circumstances subsequent to the abandonment or decision not to seek or persist in seeking revival.

NOTE: Where the petition under 37 CFR 1.137(a) is filed more than two years after the date the application became abandoned, the United States Patent and Trademark Office requires an additional explanation of the circumstances surrounding the delay that establishes the entire delay was unintentional. This requirement is in addition to the requirement to provide a statement that the entire delay was unintentional. See Clarification of the Practice for Requiring Additional Information in Petitions Filed in Patent Applications and Patents Based on Unintentional Delay, 85 FR 12222 (March 2, 2020). See MPEP 711.03(c)(II)(C)-(F) for additional guidance on the information required to establish that the entire delay was unintentional.

Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application

Signature	Name	Registration #
/brendanbdix/	Brendan Dix	37313



UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #
18/671,581

RECEIPT DATE / TIME
03/25/2025 10:53:38 AM Z ET

ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

PATENT # -

CONFIRMATION # 5913

FILED BY Brendan Dix

PATENT CENTER # 69721042

AUTHORIZED BY -

CUSTOMER # 44088

FILING DATE 05/22/2024

CORRESPONDENCE ADDRESS -

FIRST NAMED INVENTOR Walter Ernest Power II

Payment Information

PAYMENT METHOD
CARD / 2039

PAYMENT TRANSACTION ID
E20253OA53537039

PAYMENT AUTHORIZED BY
Brendan Dix

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2453	PETITION FOR REVIVAL OF AN ABANDONED APPLICATION FOR A PATENT, FOR THE DELAYED PAYMENT OF THE FEE FOR ISSUING EACH PATENT, OR FOR THE DELAYED RESPONSE BY THE PATENT OWNER IN ANY REEXAMINATION PROCEEDING, DELAY LESS THAN OR EQUAL TO TWO YEARS	904.00	1	904.00
TOTAL AMOUNT:				\$904.00

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.

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.



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Commissioner for Patents
United States Patent and Trademark Office
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GRANT LETTER

APPLICATION #	DECISION DATE	DECISION ON PETITION	ATTORNEY DOCKET NUMBER
18/671,581	03/25/2025	UNDER CFR 1.137(a)	TETH143.03

Title of Invention

Bridge Rope Assembly

In re Application of: Walter Power

This is an electronic decision on the petition under 37 CFR 1.137(a), filed March 25, 2025, to revive the above-identified application.

The petition is **GRANTED**.

The above-identified application became abandoned for failure to reply in timely manner to the outstanding Office communication. The date of abandonment is the day after the last day of the period set for the reply in Office action plus any applicable extensions of time properly requested.

The electronic petition satisfies the conditions for revival pursuant to the provisions of 37 CFR 1.137(a) in that (1) the reply in form of a response; (2) the petition fee as set forth in 37 CFR 1.17(m); and (3) the required statement of unintentional delay have been received. Accordingly, the response is accepted as having been unintentionally delayed.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being directed to the Technology Center.

Office of Petitions



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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18/671,581

05/22/2024

Walter Ernest Power II

TETH143.03

5913

44088 7590 03/20/2025
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

EXAMINER

MC FARLAND, KATHLEEN MAVOURNEEN

ART UNIT	PAPER NUMBER
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3635

NOTIFICATION DATE	DELIVERY MODE
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03/20/2025

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):

jason@kaufholdlaw.com

Notice of Abandonment	Application No.	Applicant(s)
	18/671,581	Power et al.
	Examiner	Art Unit
	Kathleen M McFarland	3635

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

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 12 August 2024.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
 - (b) ☒ A proposed reply was received on 10 December 2024, but it does not constitute a proper reply under 37 CFR 1.113 to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) if this is utility or plant application, a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. Note that RCEs are not permitted in design applications.)
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a *bona fide* attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 8 below).
 - (d) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$ _____ is insufficient. A balance of \$ _____ is due.
The issue fee required by 37CFR 1.18 is \$ _____. The publication fee, if required by 37 CFR 1.18(d), is \$ _____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record or other party authorized under 37 CFR 1.33 (b). See 37 CFR 1.138(b).
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34) upon the filing of a continuing application.
6. ☐ The decision by the Patent Trial and Appeal Board rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The dismissal of the appeal in an application having no allowed claims. (When an appeal is dismissed in an application having no allowed claims the application stands abandoned. See MPEP 1215.04 subsections I-V for an explanation of the reasons why an appeal is dismissed.)
8. ☒ The reason(s) below:

While the amendment was filed on 12/10/2024 it came after the period for response and did not have an extension of time fee so it was not a timely response.

/BRIAN D MATTEI/ Supervisory Patent Examiner, Art Unit 3635	/Kathleen M. McFarland/ Examiner, Art Unit 3635
--	--

Petitions to revive under 37 CFR 1.137, or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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18/671,581

05/22/2024

Walter Ernest Power II

TETH143.03

5913

44088 7590 03/04/2025
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

EXAMINER

MC FARLAND, KATHLEEN MAVOURNEEN

ART UNIT	PAPER NUMBER
----------	--------------

3635

NOTIFICATION DATE	DELIVERY MODE
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03/04/2025

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):

jason@kaufholdlaw.com

<p align="center">NOTICE REQUIRING EXTENSION OF TIME FEE <i>No New Time Period is Provided</i></p>	<p>Application No. 18/671,581</p>	<p>Applicant(s) Power et al.</p>
	<p>Art Unit OMBL</p>	<p>AIA (FITF) Status Yes</p>

Applicant's reply to the Office Action mailed on 12 August 2024 was received in the Office on 10 December 2024, which is after the expiration of the period for reply set in the Office action. The time period for reply continues to run from the mailing date of the Office action. This application will become ABANDONED unless applicant obtains an extension of time by filing a petition under 37 CFR 1.136(a) accompanied by the appropriate fee as set forth in 37 CFR 1.17(a)(1)-(5) within the maximum extendable time period for reply (e.g., six months for a reply to a non-final rejection).

The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee due. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant reply later than the maximum period of SIX (6) MONTHS statutory period or obtain an extension for more than FIVE (5) MONTHS beyond the date for reply set forth in an Office action.

- ☒ 1. The appropriate extension of time fee is missing.
- ☐ 2. The extension of time fee submitted is insufficient.
- ☐ 3. The funds in Deposit Account No. _____ are insufficient to cover the entire fee due. The balance is due within the time period set forth in this notice. See note below regarding the appropriate service charge.
- ☐ 4. The Credit Card payment to cover the entire fee due to Account _____ (Card type + last 4 digits ONLY) was refused. The balance is due within the time period set forth in this notice. See note below regarding the appropriate service charge.
- ☐ 5. Other.

Explanation (*Provide specific details of the required correction in order to assist the applicant. Indicate whether a service charge has been added to the fee due*):

THE AMOUNT OF THE FEE(S) DUE IS SUBJECT TO CHANGE, GENERALLY ON OCTOBER 1 OF EACH YEAR (37 CFR 1.17 & 1.21). THE AMOUNT OF THE FEE(S) DUE IS DETERMINED AS OF THE DATE A COMPLETE REPLY WITH THE APPROPRIATE FEE(S) IS RECEIVED BY THE OFFICE (37 CFR 1.8 & 1.10). BECAUSE THE AMOUNT DUE IS SUBJECT TO CHANGE, IT IS RECOMMENDED THAT APPLICANT CHECK THE CURRENT FEE SCHEDULE WHICH IS AVAILABLE ON THE USPTO'S WEBSITE AT: <http://www.uspto.gov/web/offices/lac/qs/ope/fees.htm>

Service Charges: There is a \$50 service charge for processing each payment refused (including a check returned unpaid) or charged back by a financial institution (37 CFR 1.21(m)). There is a \$25.00 service charge for each month when the balance of a deposit account is below \$1000 at the end of the month (37 CFR 1.21(b)(2)).

Technical Support Staff (TSS): /RICARDO ANTONIO CAMOU/

Telephone Number: (571)272-1542

Note to TSS: Please do NOT use this notice if the application is under a final rejection.



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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/671,581

RECEIPT DATE / TIME
12/10/2024 04:00:40 PM Z ET

ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

PATENT # -

CONFIRMATION # 5913

FILED BY Brendan Dix

PATENT CENTER # 68310903

FILING DATE 05/22/2024

CUSTOMER # 44088

FIRST NAMED INVENTOR Walter Ernest Power II

CORRESPONDENCE ADDRESS -

AUTHORIZED BY -

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
TETH143.03FirstOA.pdf	7	Applicant Arguments/Remarks Made in an Amendment	40 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
TETH143.03FirstOA.pdf	1DFA1A161AFCDF4320B71CB73AD19AFD0078E98C3D190AF9 D73ECE4BE009982CA5306E4E3E8E0A525DE10FF259EB434D 43421FDF2C5B2040096D9355AEF3668A

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 Patent Application of)
Walter Ernest Power II)
Serial No.: 18/671,581)
Filed: 05/22/2024)
For: Bridge Rope Assembly)
Examiner: Kathleen Mavourneen McFarland)
Group Art Unit: 3635)
Attorney: Brendan B. Dix)

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

I CERTIFY THAT THIS PAPER (ALONG WITH ANY REFERENCED TO AS BEING ATTACHED OF ENCLOSED) IS BEING TRANSMITTED TO THE COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 ON December 10, 2024, VIA THE USPTO-EFS-WEB FILING SYSTEM. By: /brendanbdix/

FEE CALCULATION: No Additional Fees Due. Upon entry of the below amendment, the total number of claims will be 20 or less, and the number of independent claims will be 3 or less.

AMENDMENT

Responsive to the Office Action mailed on August 12, 2024.

Table of Contents

Amendments in the Claims: page 2
Amendments in the Specification: none
In the Abstract: none
Remarks: page 5
Conclusion: page 7

Amendments in the Claims: (struck-through parts deleted and underlined parts added)

1. (original) A bridge rope assembly configured to couple together a tree rope to a first bridge loop and a second bridge loop on a harness, the bridge rope assembly including:

a main body comprising a rope having a first end and a second end, the main body having a splice therein to form an eye loop in the main body, the eye loop being configured to permanently or releasably engage with the first bridge loop to permanently or releasably secure the main body to the first bridge loop, the main body comprising a first portion including the first end and a second portion including the second end, the first portion extending through the second portion of the main body such that the first end is positioned within the second portion adjacent to the second end; and
a friction hitch being positioned on the main body between the second end and the eye loop, the friction hitch being configured to permanently or releasably engage with the second bridge loop to permanently or releasably secure the friction hitch to the second bridge loop, the friction hitch comprising a closed loop.

2. (original) The bridge rope assembly according to claim 1, wherein the rope has a length from the first end to the second end between 72.0 inches and 126.0 inches.

3. (original) The bridge rope assembly according to claim 1, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches.

4. (original) The bridge rope assembly according to claim 3, wherein the main body includes a stop knot in the second portion adjacent to the second end.

5. (original) The bridge rope assembly according to claim 4, further including a securing member being positioned on the main body at a juncture of the first and second ends to retain the first and second ends at a static position relative to each other.

6. (currently amended) The bridge rope assembly according to claim 4, wherein the closed loop comprises a single rope being formed into the closed loop.

7. (original) The bridge rope assembly according to claim 6, wherein the single rope of the closed loop has a length between 40.0 inches and 60.0 inches.

8. (original) The bridge rope assembly according to claim 7, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

9. (original) The bridge rope assembly according to claim 1, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

10. (original) The bridge rope assembly according to claim 9, wherein the main body and the friction hitch each are comprised of UHMWPE.

11. (original) The bridge rope assembly according to claim 1, wherein the main body is comprised of UHMWPE.

12. (original) The bridge rope assembly according to claim 9, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches.

13. (original) The bridge rope assembly according to claim 12, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

14. (original) The bridge rope assembly according to claim 12, wherein a distance between the first and second ends is less than 2.0 inches.

15. (original) A method of installing the bridge rope assembly on a harness according to claim 1, comprising the steps of:
releasably engaging the eye loop with the first bridge loop of the harness; and
releasably engaging the friction hitch with the second bridge loop of the harness.

16. (original) The method of claim 15, wherein the step of releasably engaging the eye loop with the first bridge loop comprises inserting the second end of the rope through the first bridge loop and through the eye loop and forming a releasable knot with the eye loop wrapped around the first bridge loop.

17. (original) The method of claim 15, wherein the step of releasably engaging the friction hitch with the second bridge loop comprises inserting a portion of the closed loop through the second bridge loop and forming a releasable knot with the portion of the closed loop wrapped around the second bridge loop.

REMARKS

Section 1 of the Office Action

Claim 6 is objected to because of informalities. Appropriate correction is required.

Claim 6 has been amended to end in a period.

Withdrawal of the objection is respectfully requested by the applicant.

Section 2 of the Office Action

Claims 1 through 9 and 12 through 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 20080000719 to Jones in view of U.S. Patent 5699657 to Paulson.

It is respectfully submitted claim 1 is not obvious in view of the collective teaching of the cited references. Claim 1 specifically requires a main body comprising a rope with a splice forming an eye loop configured for engaging a first bridge loop and a friction hitch for engaging a second bridge loop. Thus, the main body is supporting the body of the user. It is respectfully submitted these claim limitations are not disclosed, taught, suggested, or contemplated in the collective teaching of the cited references. The rejection relies on Jones as teaching the main body but the structure of Jones is not attached to bridge loops and so Jones is not a bridge rope assembly as suggested in the rejection. Jones specifically teaches a foot strap suspension relief device which attaches to a harness to extend under the feet to supplement weight bearing of the harness. The Jones device in no way provides primary support to the harness as is the case for the claimed invention. In Jones, the primary support of the harness is provided by safety line 50 and “the strap 12 functions as a foothold 52”, para. [[0024]]. As noted in the rejection, Jones fails to teach use of a splice as claimed. The rejection relies on the teaching of Paulson, which merely teaches a splice structure, but does not address in any way primary support of a harness. As such, collectively, the cited references fail to address use of a splice forming an eye loop relating to primary support of a harness. This is one of the main benefits of the invention as the issue being addressed was addressed in the field of the invention section of the present application.

The disclosure relates to harness rope structures and more particularly pertains to a new harness rope structures for utilizing eye splices having fully buried rope ends which extend completely into their mating counterparts a sufficient distance such that a double layer of rope is created. It has been found that such a construction allows high strength materials that are otherwise susceptible to heat/friction damage, or are of such low friction that they do not typically retain a closed loop formation under stress, to be used safely for harness bridge ropes.

As noted in the present application quoted above, the invention as claimed becomes safe for use for harness bridge ropes, an issue not mentioned or contemplated within any teaching or disclosure of the cited references. It is respectfully submitted that the use of a splice in a primary support was a potential hazard being addressed by the present invention, i.e. a known problem. However, that known problem is not addressed or contemplated within the collective teaching of the cited references such that the combination of an eye splice as in Paulson would not be an obvious modification to the structure of Jones for use as a primary support. Therefore, claim 1 is not obvious and should be allowed.

By virtue of dependence on claim 1, claims 1 through 9 and 12 through 17 are believed to be allowable.

Withdrawal of the rejection is respectfully requested by the applicant.

Section 3 of the Office Action

Claims 10 through 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 20080000719 to Jones in view of U.S. Patent 5699657 to Paulson, and further in view of U.S. Patent Publication No. 20190301089 to De Sousa Faria.

By virtue of dependence on claim 1, claims 10 and 11 are believed to be allowable.

Withdrawal of the rejection is respectfully requested by the applicant.

CONCLUSION

In light of the foregoing amendments and remarks, early consideration and allowance of this application are most courteously solicited.

Respectfully submitted,

/brendanbdix/

Date: 12/10/24

Brendan B. Dix (Reg. No. 37,313)

P.O. Box 89626

Sioux Falls, SD 57109

(605) 334-1571 FAX (605) 334-1574

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/671,581	Filing Date 05/22/2024	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$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)		RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	12/10/2024	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA			
	Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0	x \$40 =	0
	Independent (37 CFR 1.16(h))	* 1	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(i))	*	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.						Case Resolution Specialist	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/JEFFERY L OLSEN/	
*** 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.**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/671,581	05/22/2024	Walter Ernest Power, II	TETH143.03

CONFIRMATION NO. 5913

44088
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

PUBLICATION NOTICE



OC000000078140648

Date Mailed: 09/19/2024

Title:Bridge Rope Assembly

Publication No.US-2024-0307716-A1

Publication Date:09/19/2024

NOTICE OF PUBLICATION OF APPLICATION

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/671,581	05/22/2024	Walter Ernest Power II	TETH143.03	5913
44088 7590 08/12/2024 KAUFHOLD DIX PATENT LAW P. O. BOX 89626 SIOUX FALLS, SD 57109			EXAMINER MCFARLAND, KATHLEEN MAVOURNEEN	
			ART UNIT	PAPER NUMBER
			3635	
			NOTIFICATION DATE	DELIVERY MODE
			08/12/2024	ELECTRONIC

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

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jason@kaufholdlaw.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 Objections

Claim 6 is objected to because of the following informalities:

Claim 6 fails to end with a period.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis (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 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

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claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 and 12-17 are rejected under 35 U.S.C. 103 as being unpatentable over **Jones (2008/0000719)** in view of **Paulson (5,699,657)**.

Jones discloses:

Claim 1: A bridge rope assembly (**Fig. 1; 10**) configured to couple together a tree rope to a first bridge loop (**Fig. 4; see detail**) and a second bridge loop (**Fig. 4; see detail**) on a harness (**Fig. 4; 18**), the bridge rope assembly including:

a main body (**Fig. 1; 12**) comprising a rope (**Fig. 1; 12, Para. [0018]**) having a first end (**Fig. 1; see detail**) and a second end (**Fig. 1; see detail**), the main body having an eye loop (**Fig. 1; 16**) in the main body, the eye loop being configured to permanently or releasably engage with the first bridge loop (**Fig. 4; Para. [0023]**) to permanently or releasably secure the main body to the first bridge loop (**Fig. 4; Para. [0018]**), the main body comprising a first portion (**Fig. 1; see detail**) including the first end and a second portion (**Fig. 1; see detail**) including the second end (**Fig. 1; see detail**); and

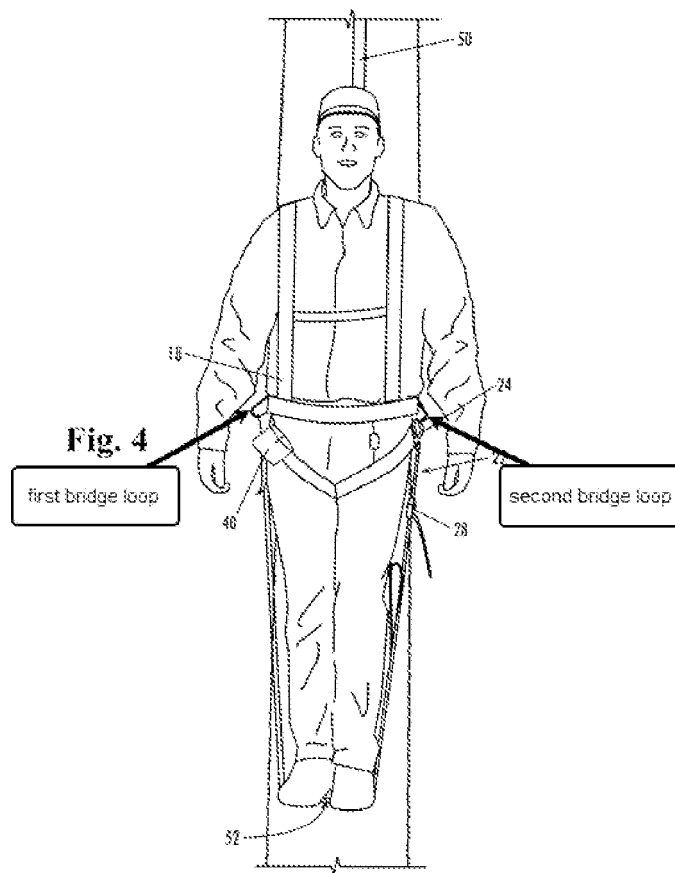
a friction hitch (**Fig. 1; 28**) being positioned on the main body between the second end and the eye loop (**Fig. 1; see detail**), the friction hitch being configured to permanently or releasably engage (**Fig. 1; via 24**) with the second bridge loop to permanently or releasably secure the friction hitch to the second bridge loop, the friction hitch comprising a closed loop (**Fig. 2A; 26**).

Jones fails to disclose the eye loop being formed by a splice where the first portion extends through the second portion of the main body such that the first end is positioned within the second portion adjacent to the second end.

However, **Paulson** discloses forming an eye loop (**Fig. 10; 28**) by a splice (**Fig. 10; 10**) where the first portion (**Fig. 10; nearest 44**) extends through the second portion (**Fig. 10; nearest 40**) and the first end (**Fig. 10; 22**) is positioned within the second portion adjacent the second end (**Fig. 10; 20**).

Therefore, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention to replace the eye loop of **Jones** with the spliced eye loop, as taught by **Paulson**, with a reasonable expectation of success because it would create friction when securing the eye loop and prevent loosening of the connection.

Thus, in combination Jones and Paulson disclose the bridge rope assembly, of Jones, where the eye loop is formed by the splice, of Paulson.



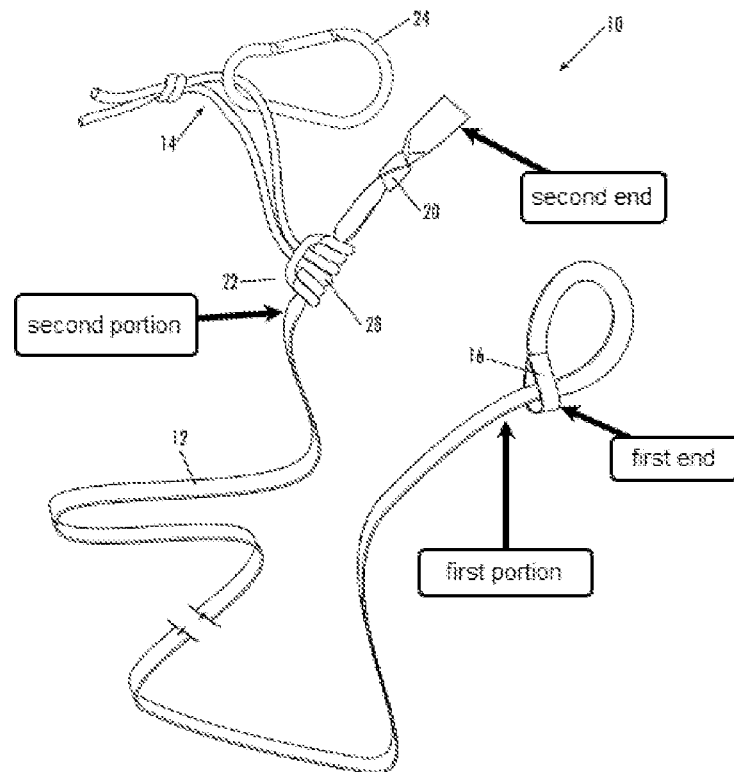


Fig. 1

Claim 2: Jones discloses the bridge rope assembly according to claim 1, wherein the rope has a length from the first end to the second end between 72.0 inches and 126.0 inches (**Para. [0018]**).

Claim 3: Jones and Paulson disclose the bridge rope assembly according to claim 1, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches (**Jones and Paulson fail to expressly disclose a distance of 24 to 40 inches; however, they do disclose an eye loop that can be expanded and contracted therefore the distance of the eye**

loop from the second end can be varied and, as such, be located between 24 and 40 inches from the second end, therefore the prior art is capable of meeting the claim limitation).

Claim 4: Jones discloses the bridge rope assembly according to claim 3, wherein the main body includes a stop knot (**Fig. 1; 20**) in the second portion adjacent to the second end (**Fig. 1; see detail**).

Claim 5: Jones and Paulson disclose the bridge rope assembly according to claim 4, further including a securing member (**Paulson - Fig. 10; 40**) being positioned on the main body at a juncture of the first and second ends (**Fig. 10; combined at 40**) to retain the first and second ends at a static position relative to each other (**Fig. 10; held in position at 40**).

Claim 6: Jones discloses the bridge rope assembly according to claim 4, wherein the closed loop comprises a single rope being formed into the closed loop (**Fig. 2A; 26 is depicted as a single rope**)

Claim 7: Jones discloses the bridge rope assembly according to claim 6, but fails to disclose wherein the single rope of the closed loop has a length between 40.0 inches and 60.0 inches.

While **Jones** fails to disclose the single rope of the closed loop having a length between 40 and 60 inches, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use a longer length of rope for the closed loop, since it has been held that, “where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.” The examiner contends that a longer

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segment of rope would not perform differently than that of the length recited by Jones, since it would not change the purpose or function of the friction hitch. **See MPEP 2144.04(IV)(A) – Changes in Size.**

Claims 8, 9 and 13: Jones discloses the bridge rope assembly according to claims 1, 7 and 12, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches (**Para. [0019]**).

Claim 12: Jones and Paulson disclose the bridge rope assembly according to claim 9, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches (**Jones and Paulson fail to expressly disclose a distance of 24 to 40 inches; however, they do disclose an eye loop that can be expanded and contracted therefore the distance of the eye loop from the second end can be varied and, as such, be located between 24 and 40 inches from the second end, therefore the prior art is capable of meeting the claim limitation**).

Claim 14: Jones and Paulson disclose the bridge rope assembly according to claim 12, wherein a distance between the first and second ends is less than 2.0 inches (**Jones and Paulson fail to expressly disclose a distance between the first and second ends of less than 2 inches; however, Paulson depicts in Fig. 10 first and second ends (ends of 20 and 22) that are in close proximity to one another. Paulson discusses an example rope of 5/8 inch thickness, with that thickness in mind the scale would determine that the distance between the ends is less than 2 inches, therefore the prior art is capable of meeting the claim limitation**).

Claim 15: Jones and Paulson disclose a method of installing the bridge rope assembly on a harness according to claim 1, comprising the steps of:

releasably engaging the eye loop (**Jones/Paulson - Fig. 1; 16**) with the first bridge loop (**Fig. 4; see detail**) of the harness (**Fig. 4; 18**); and releasably engaging the friction hitch (**Fig. 1; 28**) with the second bridge loop (**Fig. 4; see detail**) of the harness.

Claim 16: Jones and Paulson disclose the method of claim 15, wherein the step of releasably engaging the eye loop with the first bridge loop comprises inserting the second end of the rope through the first bridge loop and through the eye loop and forming a releasable knot with the eye loop wrapped around the first bridge loop (**Fig. 1; 16, Para. [0018]**).

Claim 17: Jones and Paulson disclose the method of claim 15, wherein the step of releasably engaging the friction hitch with the second bridge loop comprises inserting a portion of the closed loop (**Fig. 2A; via 24**) through the second bridge loop (**Fig. 4; see detail**) and forming a releasable knot (**Fig. 1; nearest 14**) with the portion of the closed loop wrapped around the second bridge loop.

Claims 10-11 are rejected under 35 U.S.C. 103 as being unpatentable over **Jones (2008/0000719)** in view of **Paulson (5,699,657)** and further in view of **De Sousa Faria (2019/0301089)**.

Claims 10 and 11: Jones discloses the bridge rope assembly according to claims 1 and 9, but fails to disclose wherein the main body and the friction hitch each are comprised of UHMWPE.

However, **De Sousa Faria** discloses a rope comprised of UHMWPE (**Fig. 1; Para. [0016]**).

Therefore, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention to modify the main body and friction hitch ropes of

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Jones to be manufactured of UHMWPE, as taught by **De Sousa Faria**, with a reasonable expectation of success because it would provide a rope with high tenacities, low stretch and low elongation at break (Para. [0015]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen M. McFarland whose telephone number is (571)272-9139. The examiner can normally be reached Monday-Friday 8:00am-4:00pm.

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, Brian Mattei can be reached on (571) 270-3238. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Kathleen M. McFarland/

Examiner, Art Unit 3635

/JESSICA L LAUX/

Primary Examiner, RD00

Kathleen M. McFarland

Examiner

Art Unit 3635

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*	B	US-20210178200-A1	2021-06-17	Power, II; Walter Ernest	A63B27/00	1/1
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A62B35/0037; B35/0075; B35/0025; B35/0031; B35/0012	08/06/2024	KMM
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	2	8292028		2012-10-23	Wise	
	3	8356691		2013-01-22	Griffith	
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	6	9808659		2017-11-07	Chevalier	
	7	10258814		2019-04-16	Casebolt	
	8	11504556		2022-11-22	Power II	
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	2	20090255756		2009-10-15	Green	

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Examiner Signature	/Kathleen M. McFarland/	Date Considered	07/18/2024
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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.

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		
First Named Inventor	Walter Ernest Power II	
Art Unit		
Examiner Name		
Attorney Docket Number	TETH143.03	

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	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

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	/brendandix/	Date (YYYY-MM-DD)	2024-05-21
Name/Print	Brendan B. Dix	Registration Number	37,313

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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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.

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	96	((("POWER") near3 ("Walter")) OR ((("GODFREY") near3 ("Gregory")) OR ((("KOSSUTH") near3 ("Carl")) OR ((("CHADWICK") near3 ("Shawn"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/07/18 06:21 PM
L2	12	("10258814" "11504556" "20080179136" "20090255756" "8061479" "8292028" "8356691" "8584799" "9320925" "9808659").PN.	(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))	OR	ON	ON	2024/07/18 06:23 PM
L3	403	(A62B35/0012).cpc.	(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))	OR	ON	ON	2024/07/18 06:27 PM
L4	2662	(A62B35/0037 OR A62B35/0075).cpc.	(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))	OR	ON	ON	2024/07/18 06:28 PM
L5	37	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2024/07/19

		<p>More like doc: US-20230173312-A1</p> <p>Text: (US-12011623-B1 OR US-20230248135-A1 OR US-20130068556- A1 OR EP-3512609-A1 OR WO-2018051068- A1 OR US- 20210228923-A1 OR US-11964175-B2 OR US-11504556-B2 OR US-20220347501-A1 OR EP-3512609-B1 OR US-4396091-A OR US- 20120012421-A1 OR WO-8910160-A1 OR EP-0411011-B1 OR US-5050704-A OR US- 20130319793-A1 OR FI-90016-B OR DK- 166067-B OR US- 4315655-A OR US- 7090050-B1).did.</p>	<p>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>				10:31 AM
L6	34	<p>(Artificial Intelligence)</p> <p>More like doc: US-20210228923-A1</p> <p>Text: (US-11504556-B2 OR US-11964175-B2 OR US-20220347501-A1 OR US-20240216723- A1 OR US- 20200398087-A1 OR US-11351405-B2 OR US-20210101032-A1 OR US-11623109-B2 OR US-10604892-B1 OR JP-6606540-B2 OR US-11511141-B2 OR US-20220080234-A1 OR US-20220249886- A1 OR US-11850474- B2 OR US-11771931- B2 OR US- 20220126171-A1 OR AU-2015233538-B2 OR AU-2015233538-A1 OR US-8136438-B2 OR US-20210086873- A1).did.</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	2024/07/19 10:32 AM
L7	36	<p>(Artificial Intelligence)</p> <p>More like doc: US-20210101032-A1</p> <p>Text: (US-11623109-B2 OR US-11351405-B2 OR</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,</p>	OR	ON	ON	2024/07/19 10:35 AM

L8	36	<p>US-20220266072-A1 OR US-20200398087-A1 OR US-12011623-B1 OR US-20210178200-A1 OR US-11850452-B2 OR US-8322488-B2 OR US-7909137-B2 OR US-20120018248-A1 OR US-20190269948-A1 OR US-20220249886-A1 OR US-20210228923-A1 OR US-20220347501-A1 OR EP-3551297-B1 OR US-5228412-A OR US-6390234-B1 OR US-9808659-B2 OR US-20150231422-A1 OR US-5067585-A).did.</p> <p>(Artificial Intelligence) More like doc: US-20200398087-A1</p> <p>Text: (US-11351405-B2 OR US-20200398088-A1 OR US-20210101032-A1 OR US-11623109-B2 OR US-20200324153-A1 OR US-20220266072-A1 OR US-12011623-B1 OR US-20190269948-A1 OR AU-2017245405-A1 OR US-20210178201-A1 OR US-11179584-B2 OR US-11850452-B2 OR US-20210178200-A1 OR US-20210023400-A1 OR FR-3067942-B1 OR ES-2784734-T3 OR FR-3067942-A1 OR US-11771931-B2 OR US-20220249886-A1 OR EP-3421101-A1).did.</p>	<p>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	2024/07/19 10:35 AM
L9	32	<p>(Artificial Intelligence) More like doc: US-20220249886-A1</p> <p>Text: (US-11771931-B2 OR US-20220266072-A1 OR US-20200398088-A1 OR US-20200324153-A1 OR</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,</p>	OR	ON	ON	2024/07/19 10:36 AM

L10	48	US-11351405-B2 OR US-20200398087-A1 OR CA-2719594-A1 OR US-20110101061-A1 OR US-9101789-B2 OR CA-2719594-C OR US- 20180126195-A1 OR US-20120217090-A1 OR FR-2649618-A1 OR FR-3132228-A1 OR FR-3132228-B1 OR MX-2017014147-A OR US-20150060195-A1 OR CA-2173181-C OR CA-2173181-A1 OR AT-E230286-T1).did. ("1903081" "2254179" "3757893" "4318502" "4347914" "4396091" "4399595" "4687074" "5010850" "6364412" "6378174" "6854801" "7051836" "7063185" "7178185" "7455593" "7909137" "8322488" "8661720" "9162091" "9210978" "10016633" "10159858" "11122844" "11179584" "11351405" "20050139419" "20050192159" "20100200329" "20150231422" "20170291047" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20200398088" "20210023400" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999").pn. OR ("11771931").urpn. AND (PGPB USPT USOC).dbnm. (Artificial Intelligence) More like doc: US-11771931-B2	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) (US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/19 10:38 AM
L11	36	(Artificial Intelligence) More like doc: US-11771931-B2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2024/07/19 10:38 AM

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L12	26	("1636459" "3448826" "3757893" "4446943" "4687074" "4991689" "5136724" "5183007" "6128782" "6213365" "6223854").pn. OR ("7063185").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/19 11:09 AM
L13	33	(Artificial Intelligence) More like doc: US-7063185-B2 Text: (US-20050139419-A1 OR US-20040154863- A1 OR CA-2432773-A1 OR US-7051836-B2 OR US-20060169534-A1 OR CA-2527459-A1 OR US-8322488-B2 OR US-20120018248-A1 OR CA-2572651-A1 OR US-7909137-B2 OR US-20210178201-A1 OR US-11179584-B2 OR US-5341896-A OR US-4687074-A OR US- 6125966-A OR US- 20120217090-A1 OR US-11850452-B2 OR US-20210178200-A1 OR US-5052514-A OR US-20090255756- 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	2024/07/19 11:09 AM
L14	33	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2024/07/19

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L15	32	(Artificial Intelligence) More like doc: US-20220249886-A1 Text: (US-11771931-B2 OR US-20220266072-A1 OR US-20200398088- A1 OR US- 20200324153-A1 OR US-11351405-B2 OR US-20200398087-A1 OR CA-2719594-A1 OR US-20110101061-A1 OR US-9101789-B2 OR CA-2719594-C OR US- 20180126195-A1 OR US-20120217090-A1 OR FR-2649618-A1 OR FR-3132228-A1 OR FR-3132228-B1 OR MX-2017014147-A OR US-20150060195-A1 OR CA-2173181-C OR CA-2173181-A1 OR AT-E230286-T1).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	2024/07/19 02:33 PM
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L17	33	"6299040" "6533066" "20060027277").pn. OR ("7909137").urpn. AND (PGPB USPT USOC).dbnm. (Artificial Intelligence) More like doc: US-7909137-B2 Text: (US-20060169534-A1 OR US-20120018248- A1 OR US-8322488-B2 OR CA-2572651-A1 OR US-7063185-B2 OR US-20050139419-A1 OR US-20040154863- A1 OR CA-2432773-A1 OR US-7051836-B2 OR CA-2527459-A1 OR US-20120217090-A1 OR US-20090255756- A1 OR US-6125966-A OR PT-2724752-T OR US-20020074185-A1 OR US-8281894-B2 OR US-6732834-B2 OR US-20070204377-A1 OR US-6223854-B1 OR US-4546851-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	2024/07/19 02:35 PM
L18	25	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923- A1 OR US- 20200398087-A1 OR US-20080179136-A1 OR US-20090255756- A1 OR US- 20230173312-A1 OR US-20050139419-A1 OR US-20220249886- A1).did. AND PGPB.dbnm.) OR ((US- 20210228923-A1 OR US-20210101032-A1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, 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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/07/23 11:39 AM

L19	83	OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPI.dbnm.) ("10016633" "10159858 "11122844" "1117958 4" "11351405" "190308 1" "20050139419" "200 50192159" "201002003 29" "20150231422" "20 170291047" "20180126 195" "20180255889" "2 0190192887" "2019026 9948" "20200114181" " 20200324153" "202003 98087" "20200398088" " "20210023400" "20210 101032" "20210178200 "20210178201" "2021 0228923" "2021037099 9" "2254179" "3757893" "4318502" "4347914" " 4396091" "4399595" "4 687074" "5010850" "63 64412" "6378174" "685 4801" "7051836" "7063 185" "7178185" "74555 93" "7909137" "832248 8" "8661720" "9162091" "9210978" "202003241 53" "20200398088" "20 210101032" "3757893" " "4687074" "7063185" "8 322488" "10016633" "1 0159858" "11122844" "1 11179584" "1903081" "1 20050139419" "200501 92159" "20100200329" "2 0150231422" "20180 126195" "20180255889 "20190192887" "2019 0269948" "2020011418 1" "20200324153" "202 00398087" "202003980 88" "20210101032" "20 210178200" "20210178 201" "20210228923" "2 0210370999" "3757893 "4318502" "4347914" "4 4399595" "4687074" "5 010850" "6378174" "70 51836" "7063185" "717 8185" "7909137" "8322 488" "8661720" "92109 78" "10016633" "10159 858" "11122844" "1117 9584" "1903081" "2005	(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))	OR	ON	ON	2024/07/23 01:28 PM
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		0139419" "20050192159" "20100200329" "20150231422" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20200398088" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999" "3757893" "4318502" "4347914" "4399595" "4687074" "5010850" "6378174" "7051836" "7063185" "7178185" "7909137" "8322488" "8661720" "9210978").PN.					
L20	48	("0572751" "1775736" "1642911" "2252998" "2979028" "2960180" "2979153" "3098479" "3322102").pn. OR ("3757893").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:20 PM
L21	36	(Artificial Intelligence) More like doc: US-3757893-A Text: (EP-0819018-A1 OR EP-0819018-B1 OR US-6244379-B1 OR CN-107441651-B OR US-5228412-A OR US-8056675-B2 OR WO-9324182-A1 OR US-5329884-A OR ES-2793326-T3 OR US-5131490-A OR EP-0511319-A4 OR CA-2067119-C OR EP-3228362-B1 OR US-5531292-A OR CA-2155457-A1 OR US-20180360683-A1 OR RU-2741419-C2 OR CN-107441651-A OR US-3738449-A OR US-6367582-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	2024/07/23 08:20 PM
L22	29	("1351734" "3022856" "3217840" "3695397" "3757893" "3757901" "4311217").pn. OR ("4508193").urpn. AND (PGPB USPT	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:23 PM

L23	40	USOC).dbnm. (Artificial Intelligence) More like doc: US-4508193-A Text: (US-4550801-A OR US-4538704-A OR US-5145036-A OR AU-653576-B2 OR US-6672428-B2 OR US-20030159887-A1 OR US-5671822-A OR US-3717219-A OR US-20130240293-A1 OR US-20160206902-A1 OR EP-0442913-B1 OR US-4341285-A OR US-8261877-B2 OR PT-96520-A OR EP-0442913-A1 OR US-6062340-A OR US-20080230313-A1 OR WO-9516496-A1 OR GB-2259855-A OR US-5186275-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	2024/07/23 08:23 PM
L24	16	("2252998").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/07/23 08:30 PM
L25	38	(Artificial Intelligence) More like doc: US-2252998-A Text: (US-2960180-A OR US-6962232-B2 OR US-8235173-B2 OR CA-2091930-A1 OR US-9168401-B2 OR WO-2015112319-A1 OR WO-2007139954-A2 OR US-20070272484-A1 OR US-9155925-B2 OR FR-3062575-B1 OR US-3869021-A OR CN-105536212-A OR US-8056675-B2 OR US-8353386-B2 OR WO-2005056114-A1 OR FR-3062575-A1 OR US-7140587-B1 OR US-7490610-B2 OR EP-3576849-B1 OR EP-3576849-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	2024/07/23 08:30 PM
L26	4194	L3 OR ((A62B35/0025 OR A62B35/0031 OR A01M31/02).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2024/07/23 08:36 PM

L27	41	(Artificial Intelligence) More like doc: US-20210038929-A1 Text: (EP-3772363-B1 OR EP-3772363-A1 OR DE-102019121171-A1 OR DE-102019121171- B4 OR EP-3225282-B1 OR EP-3225282-A1 OR ES-2793493-T3 OR FR-3063652-A1 OR US-20180345053-A1 OR US-6283248-B1 OR US-10799732-B2 OR EP-3138608-B1 OR US-20070272484-A1 OR GB-2541905-A OR DE-20022993-U1 OR US-20170056692-A1 OR CN-1688366-B OR EP-3138608-A1 OR US-9101789-B2 OR US-6308335-B1).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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO)) (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	2024/07/23 08:40 PM
L28	72	("0330087" "10604892" "20070102240" "2008000719" "20100213004" "20150297937" "20210101032" "2303954" "2600395" "3738449" "4036101" "4099750" "4962929" "5050704" "5062344" "5699657" "5970697" "6712181" "7182361" "7814938" "9162091" "10258814" "20080179136" "20090255756" "8061479" "8292028" "8356691" "8584799" "9320925" "9808659" "10330087" "10604892" "20070102240" "20080000719" "20100213004" "20150297937" "20210101032" "2303954" "2600395" "3738449" "4036101" "4099750" "4962929" "	(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))	OR	ON	ON	2024/07/24 02:12 PM

L29	32	5050704 "5062344 "5699657 "5970697 "6712181 "7182361 "7814938 "9162091 "0330087 "20070102240 "20080000719 "20100213004 "20150297937 "2303954 "2600395 "3738449 "5050704 "5062344 "5699657 "5970697 "6712181 "7814938 "9162091").PN. ((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPI.dbnm.)	(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	2024/08/05 10:46 AM
L30	83	("10016633 "10159858 "11122844 "11179584 "11351405 "1903081 "20050139419 "20050192159 "201002003	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2024/08/05 10:50 AM

		29" "20150231422" "20 170291047" "20180126 195" "20180255889" "2 0190192887" "2019026 9948" "20200114181" " 20200324153" "202003 98087" "20200398088" " "20210023400" "20210 101032" "20210178200 " "20210178201" "2021 0228923" "2021037099 9" "2254179" "3757893" "4318502" "4347914" " 4396091" "4399595" "4 687074" "5010850" "63 64412" "6378174" "685 4801" "7051836" "7063 185" "7178185" "74555 93" "7909137" "832248 8" "8661720" "9162091" "9210978" "202003241 53" "20200398088" "20 210101032" "3757893" " "4687074" "7063185" "8 322488" "10016633" "1 0159858" "11122844" " 11179584" "1903081" " 20050139419" "200501 92159" "20100200329" " "20150231422" "20180 126195" "20180255889 " "20190192887" "2019 0269948" "2020011418 1" "20200324153" "202 00398087" "202003980 88" "20210101032" "20 210178200" "20210178 201" "20210228923" "2 0210370999" "3757893 " "4318502" "4347914" " 4399595" "4687074" "5 010850" "6378174" "70 51836" "7063185" "717 8185" "7909137" "8322 488" "8661720" "92109 78" "10016633" "10159 858" "11122844" "1117 9584" "1903081" "2005 0139419" "2005019215 9" "20100200329" "201 50231422" "201801261 95" "20180255889" "20 190192887" "20190269 948" "20200114181" "2 0200324153" "2020039 8087" "20200398088" " 20210101032" "202101 78200" "20210178201" "	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))				
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		8185" "7909137" "8322488" "8661720" "9210978" "10016633" "10159858" "11122844" "11179584" "1903081" "20050139419" "20050192159" "20100200329" "20150231422" "20180126195" "20180255889" "20190192887" "20190269948" "20200114181" "20200324153" "20200398087" "20210101032" "20210178200" "20210178201" "20210228923" "20210370999" "3757893" "4318502" "4347914" "4399595" "4687074" "5010850" "6378174" "7051836" "7063185" "7178185" "7909137" "8322488" "8661720" "9210978"). PN.					
L32	6227	L4 OR ((A62B35/0025 OR A62B35/0031 OR A62B35/0012 OR A01M31/02).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, 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, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2024/08/05 11:28 AM
L33	498	L32 AND bridge	(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))	OR	ON	ON	2024/08/05 11:28 AM
L34	50	(Artificial Intelligence) More like doc: <u>EP-1932565-A1</u> Text: (FR-2909887-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2024/08/05 11:58 AM

L35	42	FR-3062576-A1 OR AU-2004272012-A1 OR EP-3228363-A1 OR CA-2535826-C OR FR-3049870-A1 OR AU-2004272012-B2 OR CA-2535826-A1 OR CN-105709350-B OR CN-101062439-A OR CN-101062439-B OR CH-695542-A5 OR CN-105709350-A OR EP-1557198-A1 OR EP-1459648-A1 OR AT-E487517-T1 OR FR-2865410-A1 OR CA-2089514-C OR US-20020042942-A1 OR US-6438756-B1).did.	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	2024/08/05 05:26 PM
		((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-8333262-B1).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1	(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)				

L36	25	<p>OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.)</p> <p>("2254179" "2581772" "3335468" "4474261" "4546851" "5131490" "8333262" "8464832" "D685676" "9676486" "9993669" "10016633" "10112064" "10232199" "20040163898" "20040194259" "20050082114" "20090314578" "20130104351" "20140224580" "20150231422" "20180154196").pn. OR ("11534633").urpn. AND (PGPB USPT USOC).dbnm.</p>	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 05:28 PM
L37	36	<p>(Artificial Intelligence) More like doc: US-11534633-B2</p> <p>Text: (EP-3332840-A1 OR US-20180154196-A1 OR US-20230065262-A1 OR GB-2559038-A OR GB-2577516-A OR US-20220241625-A1 OR WO-2020065279-A1 OR EP-3852881-A1 OR EP-4035743-A1 OR GB-2557308-A OR GB-2608095-A OR US-20210393998-A1 OR EP-3162411-A1 OR US-20170120087-A1 OR CN-112770816-A OR GB-2607971-A OR WO-2022263418-A1 OR AU-2022292877-A1</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)	OR	ON	ON	2024/08/05 05:28 PM

L38	35	<p>OR EP-4355438-A1 OR CA-3222645-A1).did.</p> <p>(Artificial Intelligence) More like doc: US-20230173312-A1</p> <p>Text: (US-12011623-B1 OR US-20220249886-A1 OR US-20210101032-A1 OR US-11771931-B2 OR US-11623109-B2 OR US-20230248135-A1 OR US-20130068556-A1 OR WO-2018051068-A1 OR EP-3512609-A1 OR US-20210228923-A1 OR US-20240216723-A1 OR US-11964175-B2 OR US-11504556-B2 OR US-20220347501-A1 OR EP-3512609-B1 OR US-4396091-A OR US-20120012421-A1 OR US-11351405-B2 OR US-20200398087-A1 OR WO-8910160-A1).did.</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)	OR	ON	ON	2024/08/05 05:30 PM
L39	38	<p>("0421120" "0502962" "0830134" "1117656" "1550900" "1729945" "1835068" "2189671" "2225865" "2946619" "3998561" "4139956" "4667772" "5060758" "5113551" "5310274" "5383259" "5735329" "5839541" "5947229" "6059335").pn. OR ("6712181").urpn. AND (PGPB USPT USOC).dbnm.</p>	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 05:45 PM
L40	38	<p>(Artificial Intelligence) More like doc: US-6712181-B2</p> <p>Text: (WO-02062193-A1 OR US-20020104711-A1 OR CN-102506095-A OR CN-102506095-B OR US-20130075223-A1 OR WO-2013040823-A1 OR US-6189651-B1 OR US-6059335-A OR FR-3048892-A1 OR US-</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;	OR	ON	ON	2024/08/05 05:45 PM

L41	43	<p>20050273982-A1 OR CA-2749144-C OR US-8312965-B2 OR US-9644692-B2 OR EP-0734743-A1 OR US-20090026011-A1 OR US-5947229-A OR EP-0734743-B1 OR SU-1099971-A1 OR FR-2732226-A1 OR US-7200898-B2).did.</p> <p>((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-8333262-B1).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1 OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR</p>	<p>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	2024/08/05 05:49 PM
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L42	153	US-20220249886-A1 OR US-20020104711-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.) ("0330087" "1924596" "2600395" "3884190" "4099750" "4252084").pn. OR ("4962929").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:14 PM
L43	47	(Artificial Intelligence) More like doc: US-4962929-A Text: (US-5087309-A OR US- 20020029066-A1 OR AU-2011348045-B2 OR AU-2011348045-A1 OR JP-H11244438-A OR JP-2006112021-A OR AU-2002366596-B2 OR AU-2011254063-A1 OR AU-2013205724-A1 OR AU-2011254063-B2 OR AU-2013205725-A1 OR AU-2011247890-A1 OR AU-2002366596-A1 OR AU-2013205723-A1 OR AU-2011247890-B2 OR CN-205337894-U OR US-5388598-A OR AU- 2011247889-B2 OR AU-2011247889-A1 OR JP-2005245482-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	2024/08/05 06:14 PM
L44	204	("0330087" "2600395" "4962929" "5062344" "5540703").pn. OR ("5970697").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:14 PM
L45	40	(Artificial Intelligence) More like doc: US-5970697-A Text: (CA-2245063-A1 OR US-5871193-A OR US- 20070048554-A1 OR US-20070202286-A1 OR CA-2588321-C OR US-7845609-B2 OR CA-2588321-A1 OR	(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,	OR	ON	ON	2024/08/05 06:14 PM

		EP-1990791-A2 OR US-20080283708-A1 OR US-5577299-A OR DE-202015104022-U1 OR JP-S6221889-A OR EP-2777513-B1 OR US-9463013-B2 OR EP-3260052-A2 OR CA-2846244-C OR AU- 2014201522-B2 OR US-5582266-A OR AU- 2014201522-A1 OR EP-2777513-A1).did.	RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L46	288	("2600395").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/08/05 06:16 PM
L47	34	(Artificial Intelligence) More like doc: US-2600395-A Text: (CN-105256622-A OR US-5062344-A OR NZ- 549657-A OR GB- 602948-A OR US- 20050229770-A1 OR US-7165485-B2 OR WO-03102295-A1 OR DE-60314874-T2 OR PT-1509650-E OR GB- 1480826-A OR WO- 2005085518-A2 OR AU-2005219475-A1 OR DE-1030411-B OR US- 20070137163-A1 OR US-7784258-B2 OR RU-2369674-C2 OR US-2118630-A OR AT- E510062-T1 OR RU- 2006134407-A OR NO- 324911-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	2024/08/05 06:16 PM
L48	47	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-8333262-B1 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US- 4508193-A OR US- 2252998-A OR US-	(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	2024/08/05 06:43 PM

L49	20	4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-5970697-A OR US-2600395-A OR US-7107749-B2 OR US-5699657-A).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-20080000719-A1 OR US-20170291047-A1 OR US-20210393998-A1 OR US-20180154196-A1).did. AND PGPB.dbnm.) OR ((US-20210228923-A1 OR US-20210101032-A1 OR US-20200398087-A1 OR US-20220249886-A1 OR US-20020104711-A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565-A1).did. AND FTDB.dbnm.)	(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))	OR	ON	ON	2024/08/06 02:06 PM
L50	28186	polyethylene AND rope	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/06 02:08 PM

L51	4750	L50 AND UHMWPE	(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))	OR	ON	ON	2024/08/06 02:09 PM
L52	1240	L50 AND UHMWPE	(US-PGPUB; USPAT)	OR	ON	ON	2024/08/06 02:09 PM
L53	50	((US-11850452-B2 OR US-11504556-B2 OR US-11351405-B2 OR US-8061479-B2 OR US-8292028-B2 OR US-8356691-B2 OR US-8584799-B1 OR US-9320925-B2 OR US-9808659-B2 OR US-10258814-B2 OR US-11771931-B2 OR US-8333262-B1 OR US-7063185-B2 OR US-7909137-B2 OR US-3757893-A OR US-4508193-A OR US-2252998-A OR US-4962929-A OR US-6712181-B2 OR US-5010850-A OR US-4347914-A OR US-9162091-B2 OR US-11534633-B2 OR US-5901632-A OR US-5970697-A OR US-2600395-A OR US-7107749-B2 OR US-5699657-A).did. AND USPT.dbnm.) OR ((US-20210178200-A1 OR US-20210228923-A1 OR US-20200398087-A1 OR US-20080179136-A1 OR US-20090255756-A1 OR US-20230173312-A1 OR US-20050139419-A1 OR US-20220249886-A1 OR US-20210038929-A1 OR US-	(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	2024/08/06 02:16 PM

		20080000719-A1 OR US-20170291047-A1 OR US-20210393998- A1 OR US- 20180154196-A1 OR US-20190210696-A1 OR US-20190301089- A1).did. AND PGPB.dbnm.) OR ((US- 20210228923-A1 OR US-20210101032-A1 OR US-20200398087- A1 OR US- 20220249886-A1 OR US-20020104711- A1).did. AND DWPI.dbnm.) OR ((WO-2018051068-A1 OR EP-1932565- A1).did. AND FTDB.dbnm.)					
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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



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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18/671,581

05/22/2024

Walter Ernest Power II

TETH143.03

5913

44088 7590 07/08/2024
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

EXAMINER

CENTRAL, DOCKET

ART UNIT	PAPER NUMBER
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OPAP

NOTIFICATION DATE	DELIVERY MODE
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07/08/2024

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):

jason@kaufholdlaw.com

<i>Decision Granting Request for Prioritized Examination (Track I)</i>	Application No. 18/671,581	Applicant(s) Power et al.	
	Examiner FIKIRTE A GEREMEW	Art Unit OMBL	AIA (FITF) Status Yes
<p>1. THE REQUEST FILED <u>22 May 2024</u> IS <u>GRANTED</u>.</p> <p>The above-identified application has met the requirements for prioritized examination</p> <p>A. ☒ for an original nonprovisional application (Track I).</p> <p>B. ☐ for an application undergoing continued examination (RCE).</p> <p>2. The above-identified application will undergo prioritized examination. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:</p> <p>A. filing a <u>petition for extension of time</u> to extend the time period for filing a reply;</p> <p>B. filing an <u>amendment to amend the application to contain more than four independent claims, more than thirty total claims</u>, or a multiple dependent claim;</p> <p>C. filing a <u>request for continued examination</u> ;</p> <p>D. filing a notice of appeal;</p> <p>E. filing a request for suspension of action;</p> <p>F. mailing of a notice of allowance;</p> <p>G. mailing of a final Office action;</p> <p>H. completion of examination as defined in 37 CFR 41.102; or</p> <p>I. abandonment of the application.</p> <p>Telephone inquiries with regard to this decision should be directed to FIKIRTE GEREMEW at (703) 756-1930. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.</p>			
/FIKIRTE A GEREMEW/ PROGRAM SUPPORT SPECIALIST, OMBL			

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	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Walter	Ernest	Power	II		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Columbia	State/Province	TN	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		2409 Pulaski Hwy				
Address 2						
City	Columbia	State/Province	TN			
Postal Code	38401	Country	US			
Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Gregory	Alan	Godfrey			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Richmond Hill	State/Province	GA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		50 Sunbury Drive				
Address 2						
City	Richmond Hill	State/Province	GA			
Postal Code	31324	Country	US			
Inventor 3					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Carl	Eugene	Kossuth	III		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

City	Rolla	State/Province	MO	Country of Residence	US
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Mailing Address of Inventor:

Address 1	10557 CR3600				
Address 2					
City	St. James	State/Province	MO	Country	US
Postal Code	65559	Country	US		

Inventor 4					Remove
Legal Name					

Prefix	Given Name	Middle Name	Family Name	Suffix
	Shawn	Paul	Chadwick	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service

City	Merrill	State/Province	WI	Country of Residence	US
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Mailing Address of Inventor:

Address 1	138624 Rainbow Drive				
Address 2					
City	Merrill	State/Province	WI	Country	US
Postal Code	55452	Country	US		

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

[Add](#)**Correspondence Information:**Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).☐ An Address is being provided for the correspondence information of this application.

Customer Number	44088	
Email Address		Add Email Remove Email

Application Information:

Title of the Invention	Bridge Rope Assembly		
Attorney Docket Number	TETH143.03	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

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.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

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

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
<u>18602822</u>	<u>Continuation in part</u>	<u>16736345</u> <u>17867553</u>	<u>2020-04-07</u> <u>2024-3-13</u>

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		TETH143.03	
		Application Number			
Title of Invention		Bridge Rope Assembly			
Prior Application Status		Abandoned <u>pending</u>		Remove	
Application Number		Continuity Type		Prior Application Number	
17231717 <u>18602822</u>		Continuation of		16736345 <u>17867553</u>	
Filing or 371(c) Date (YYYY-MM-DD)		2021-04-15 <u>2022-7-18</u>			
Prior Application Status		Abandoned <u>pending</u>		Remove	
Application Number		Continuity Type		Prior Application Number	
17867553		Continuation of		17231717	
Filing or 371(c) Date (YYYY-MM-DD)		2022-07-18 <u>2021-4-15</u>			
Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
17231717		Continuation of		16736345	
Filing Date (YYYY-MM-DD)		2022-07-18		Patent Number	
Issue Date (YYYY-MM-DD)		2022-11-22		11504556	
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX), the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number		Country ¹		Filing Date (YYYY-MM-DD)		Access Code ¹ (if applicable)	
Additional Foreign Priority Data may be generated within this form by selecting the Add button.							

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.

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	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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

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.

- ☒ 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:

If the Applicant is an Organization check here. ☒

Organization Name Tethrd LLC

Mailing Address Information For Applicant:

Address 1 2409 Pulaski Hwy

Address 2

City Columbia

State/Province

TN

Country US

Postal Code

38401

Phone Number

Fax Number

Email Address

Additional Applicant Data may be generated within this form by selecting the Add button.

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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.			
If the Assignee or Non-Applicant Assignee is an Organization check here. ☒			
Organization Name	Tethrd LLC		
Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1	2409 Pulaski Hwy		
Address 2			
City	Columbia	State/Province	TN
Country i	US	Postal Code	38401
Phone Number		Fax Number	
Email Address			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.			

Signature:

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	/brendanbdix/		Date (YYYY-MM-DD)	2024-05-21
First Name	Brendan B.	Last Name	Dix	Registration Number 37313
Additional Signature may be generated within this form by selecting the Add button.				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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 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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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.



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/671,581

RECEIPT DATE / TIME
06/20/2024 04:38:54 PM Z ET

ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

PATENT # -

CONFIRMATION # 5913

FILED BY Sara Egge

PATENT CENTER # 66051383

FILING DATE 05/22/2024

CUSTOMER # 44088

FIRST NAMED INVENTOR Walter Ernest Power II

CORRESPONDENCE ADDRESS -

AUTHORIZED BY Brendan Dix

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
TETH14303ADS2.pdf	9	Application Data Sheet	3004 KB

Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
TETH14303ADS2.pdf	A2E1FAF026C33BAF5FAC16B99588ED7FC6110DEE4106B6B4 DEC92FAA8A402DABB74F90185CDD73BAFF47DB4038F72C19 68201625FBA63EC643B3A977E27E92AB

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/671,581	05/22/2024	Walter Ernest Power, II	TETH143.03

CONFIRMATION NO. 5913

IMPROPER CFR REQUEST



OC000000073682889

44088
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

Date Mailed: 06/11/2024

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Continuity, Priority Claims, Petitions, and Non-Publication Requests

In response to your request for a corrected Filing Receipt, the Office is unable to comply with your request because:

- One or more of the benefit claims under 35 U.S.C. § 120 cannot be included on the Filing Receipt since applicant did not specify whether the application is a continuation, divisional or continuation-in-part of the prior application. Applicant must submit a new application data sheet (ADS) that sets forth the relationship, and the ADS must be accompanied by a petition under 37 CFR 1.78 if filed after the time period set forth in 37 CFR 1.78.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/juwimana/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
18/671,581	05/22/2024		664	TETH143.03	17	1

CONFIRMATION NO. 5913

44088
KAUFHOLD DIX PATENT LAW
P. O. BOX 89626
SIOUX FALLS, SD 57109

FILING RECEIPT



0000000073684762

Date Mailed: 06/11/2024

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)

Walter Ernest Power, II, Columbia, TN;
Gregory Alan Godfrey, Richmond Hill, GA;
Carl Eugene Kossuth, III, Rolla, MO;
Shawn Paul Chadwick, Merrill, WI;

Applicant(s)

Tethrd LLC, Columbia, TN;

Assignment For Published Patent Application

Tethrd LLC, Columbia, TN

Power of Attorney: The patent practitioners associated with Customer Number 44088

Domestic Priority data as claimed by applicant

This application is a CON of 16/736,345 01/07/2020 ABN

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.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 06/07/2024

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/671,581**

Projected Publication Date: 09/19/2024

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Bridge Rope Assembly

Preliminary Class

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

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).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

NOT GRANTED

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

SelectUSA

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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
18/671,581

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)			RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	64			N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	280			N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	320			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	17	minus 20 = *	0	x = 0		OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *		x = 0				
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).			0				
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	664			TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)	(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))							OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR			
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EX. 1151



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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

(54) **Title:** HARNESS WITH INTEGRATED ENERGY ABSORBER

(57) **Abstract:** A fall protection harness for being removably worn by a user having at least two leg straps, a first shoulder strap and a second shoulder strap. At least one of the shoulder straps has an energy absorbing element integrated therewith. The energy absorbing element may be a tubular webbing material surrounding a tearable webbing material with at least two bound webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold.

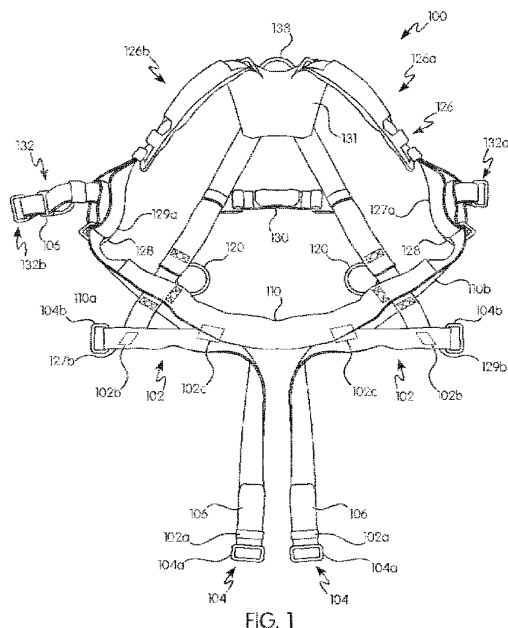


FIG. 1

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HARNESS WITH INTEGRATED ENERGY ABSORBER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Utility Application No. 15/376,233, filed December 12, 2016 entitled “Harness with Integrated Energy Absorber” the disclosure of which is incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates generally to a fall protection harness and, in particular, to a fall protection harness having an integrated energy absorber.

Description of the Related Art

[0003] As is known in the art, there exist various safety devices and arrangements that can be worn by or attached to a user to ensure the wearer’s safety in certain situations. Such mechanisms come in many forms, including, but not limited to, harnesses and safety belts. Full body harnesses are widely used for lifting and lowering individuals in dangerous situations and as a primary component in a personal fall arrest system. These harnesses can also be used for work positioning, travel restriction, ladder climbing, rescue retrieval, and evacuation. While these harnesses are used mainly in an industrial setting, and particularly the construction industry where the likelihood and danger of falls from heights is both numerous and significant, a full body harness can be used in various other applications in which total suspension and support of the body must be ensured, either expectedly or unexpectedly.

[0004] While there are many variations in full body harness construction, all typically include a plurality of elongate straps that are combined together to fit around a user’s body. In some embodiments or aspects, a full body harness may have an attachment point (D-ring) typically positioned in a central portion of the user’s back, and a plurality of straps routed around predetermined portions of the user’s body in such a manner as to hold or suspend the user in the event of a fall.

[0005] Full body harnesses, when used in a personal fall arrest system, must always be used with an energy absorbing element. In some embodiments or aspects, the energy absorbing element may be a self-retracting lanyard (SRL), and in other embodiments or aspects may include a lanyard or a rope grab. The SRL is attached at one end to an anchor point and at its other end to a line

directly connected to the user. The SRL is configured to activate once the user has begun to fall to arrest the fall soon enough to prevent injury to the user. Typically, an SRL has a housing with a rotatable drum having a line wound about the drum and a braking mechanism for controlling the rotation of the drum. The drum can rotate in a first direction to unwind (or “pay out”) the line from the housing when a certain level of tension is deliberately applied. When tension is reduced or released, the drum can slowly rotate in a reverse direction, thereby causing the line to retract or rewind onto the drum. The braking mechanism is configured for slowing down and stopping the rotation of the drum when the line unwinds too rapidly. For example, the braking mechanism may be activated to brake the rotation of the drum when the rotation speed exceeds a predetermined velocity. A sudden line pay out at a speed that exceeds normal payout is an indication that the user has experienced a fall that needs to be stopped or arrested. Should such an unintentional, accidental fall commence, the braking mechanism in the housing of the SRL is configured to engage and stop the user from falling too far.

[0006] Many falls occur over the edge of a working surface, causing the line of the SRL to bend over the edge. In such situations, the line is not moved relative to the edge, thereby imparting the entire force of a fall on a single point in the line at the edge. If an energy absorbing element is not positioned between the user and the edge, there is a risk that the user will be exposed to dangerously high forces caused by a sudden deceleration of the user’s body as the user’s weight is supported by the harness and a line attaching the user to the anchor point. Some full body harnesses have an energy absorbing element permanently attached to the D-ring on the user’s back. This design, however, is often bulky and can interfere with the user’s mobility. It also adds additional weight that the user must carry at all times.

[0007] Accordingly, there is a need in the art for an improved harness that addresses certain drawbacks and deficiencies associated with known harnesses. For example, there is a need for an improved harness with an improved energy absorbing element associated with the harness. There is a further need in the art for an improved harness that can be easily and effectively worn by the user in a variety of work environments without compromising the user’s ability to move and without adding additional weight that must be borne by the user. There is also a need for an improved harness with increased safety compliance at the worksite, and with more effective and safe support of the user in the event of a fall.

SUMMARY OF THE INVENTION

[0008] Generally, provided is an improved fall protection harness having an integrated energy absorbing element. Preferably, provided is an improved harness having an energy absorbing element, such as a tearable webbing material. Preferably, provided is an improved harness that can be easily and effectively worn by the user in a variety of work environments without compromising the user's ability to move and without adding significant weight that must be borne by the user. Preferably, provided is an improved harness that not only leads to increased safety compliance at the worksite, but also provides increased effectiveness to the personal fall protection system and a resulting increase in the safety of the user in the event of a fall.

[0009] In some preferred and non-limiting embodiments or aspects, provided is a wearable harness having a plurality of straps, optionally including a first leg strap and a second leg strap, each leg strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The harness may optionally further include a belt strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The harness includes a shoulder strap having a first shoulder strap, and a second shoulder strap. One or both of the first shoulder strap and the second shoulder strap may have an energy absorbing element integrated therewith. The energy absorbing element may have a tubular webbing encasing a tearable webbing material with at least two bound (e.g., load-bearing) webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold. Accordingly, the energy absorbing element may be integrated on or with at least a portion of at least one of the shoulder straps.

[0010] In other preferred and non-limiting embodiments or aspects, the energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap. The energy absorbing element may be exposed from the tubular webbing through an opening in the tubular webbing. The opening may be a slit formed at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap. At least a portion of the energy absorbing element may be configured to exit through the opening of the tubular

webbing upon tearing. The tubular webbing may be made from a woven tubular material. The tubular webbing may be made from a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.

[0011] In other preferred and non-limiting embodiments or aspects, the at least two bound webbing components may be bound by a plurality of binder threads or an adhesive. The plurality of binder threads may be configured to tear successively in a longitudinal direction of at least one of the first shoulder strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subject to the force that exceeds the predetermined threshold. The plurality of binder threads may extend through at least a portion of a thickness of the at least two webbing components. The plurality of binder threads may be arranged in a row, or two or more rows extending along a longitudinal length or a lateral length of the webbing components. The rows may be substantially parallel to each other or intersect with each other at least once over the longitudinal length or the lateral length of the webbing components. The plurality of binder threads may be arranged in two or more thread groups spaced apart from each other along a longitudinal length or a lateral length of the webbing components. The two or more thread groups may be arranged in a pattern. A density of the plurality of binder threads may increase from the rear portion to the front portion of the shoulder strap, or vice versa. The predetermined threshold may be in the range of about 310 lbs to about 2,250 lbs. The first shoulder strap and the second shoulder strap may have a starting tear area at the rear portion where the pair of bound webbing components is unbound. The first shoulder strap and the second shoulder strap may have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components. The energy absorbing element may be located on an energy absorbing area at the rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0012] In other preferred and non-limiting embodiments or aspects, at least one connector may be arranged on at least one of the plurality of straps and configured to facilitate removable attachment of the free floating ends of at least one of the plurality of straps. The connector may be at least one of the following: a clip, a buckle, a mating arrangement, an attachment structure, or any combination thereof. The first end of each leg strap may be adjustably attached to the second end by a connection mechanism that can adjust the length of each leg strap. The harness may have a chest strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The first end of the chest strap may be

attached to the first shoulder strap and the second end of the chest strap may be attached to the second shoulder strap. The harness may have a back strap connecting a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0013] In other preferred and non-limiting embodiments or aspects, a fall protection harness removably wearable by a user may have a plurality of straps, including an optional first leg strap, an optional second leg strap, and an optional belt strap. The fall protection harness includes a first shoulder strap and a second shoulder strap. One or both of the first shoulder strap and the second shoulder strap may have an energy absorbing element integrated therewith, the energy absorbing element comprising a tubular webbing encasing a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are subjected to a predetermined force. The energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0014] In other preferred and non-limiting embodiments or aspects, the first shoulder strap and the second shoulder strap may have a starting tear area at the rear portion where the pair of bound webbing components is unbound. The energy absorbing element may be located on an area at the rear portion of at least one of the first shoulder strap and the second shoulder strap. At least one connector may be arranged on at least one of the plurality of straps and configured to facilitate removable attachment of free floating ends of at least one of the plurality of straps. The connector may be at least one of the following: a clip, a buckle, a mating arrangement, an actuatable structure, or any combination thereof. The first end of each leg strap may be adjustably attached to the second end by a connection mechanism to adjust a length of each leg strap. The harness may have a chest strap having a first end and a second end removably attached to each other and configured to be free floating when detached from each other. The first end of the chest strap may be attached to the first shoulder strap and the second end of the chest strap may be attached to the second shoulder strap.

[0015] In other preferred and non-limiting embodiments or aspects, at least one strap of a harness may have a shoulder strap having tubular webbing encasing an energy absorbing element

having a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the shoulder strap when the shoulder strap is subjected to a predetermined force. The energy absorbing element may be exposed from the tubular webbing at a substantially intermediate portion of the shoulder strap. In a harness removably attachable to a body of a user, at least one strap may have an energy absorbing element integrated with the at least one strap.

[0016] Further preferred and non-limiting embodiments or aspects will now be set forth in the following numbered clauses.

[0017] Clause 1: A wearable harness having a plurality of straps comprising: an optional first leg strap, an optional second leg strap, an optional belt strap, a first shoulder strap, and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap comprises an energy absorbing element integrated therewith.

[0018] Clause 2: The harness of claim 1, wherein the energy absorbing element is a tubular webbing encasing a tearable webbing material with at least two bound webbing components configured to tear from one another when the shoulder strap is subjected to a force that exceeds a predetermined threshold.

[0019] Clause 3: The harness of clause 1 or 2, wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0020] Clause 4: The harness of any of clauses 1-3, wherein the energy absorbing element is exposed from the tubular webbing through an opening in the tubular webbing.

[0021] Clause 5: The harness of any of clauses 1-4, wherein at least a portion of the energy absorbing element is configured to exit through the opening of the tubular webbing upon tearing.

[0022] Clause 6: The harness of any of clauses 1-5, wherein the tubular webbing comprises a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.

[0023] Clause 7: The harness of any of clauses 1-6, wherein the at least two bound webbing components are bound by a plurality of binder threads.

[0024] Clause 8: The harness of any of clauses 1-7, wherein the plurality of binder threads are configured to tear successively in a longitudinal direction of at least one of the first shoulder

strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subjected to the force that exceeds the predetermined threshold.

[0025] Clause 9: The harness of any of clauses 1-8, wherein the plurality of binder threads extend through at least a portion of a thickness of the at least two webbing components.

[0026] Clause 10: The harness of any of clauses 1-9, wherein the plurality of binder threads are arranged in two or more substantially parallel or intersecting rows extending along a longitudinal length or a lateral length of the webbing components.

[0027] Clause 11: The harness of any of clauses 1-10, wherein the plurality of binder threads are arranged in two or more thread groups spaced apart from each other along a longitudinal length or a lateral length of the webbing components.

[0028] Clause 12: The harness of any of clauses 1-11, wherein the predetermined threshold is about 310 lbs to about 2,250 lbs.

[0029] Clause 13: The harness of any of clauses 1-12, wherein the at least two bound webbing components are bound together by an adhesive.

[0030] Clause 14: The harness of any of clauses 1-13, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the pair of bound webbing components is unbound.

[0031] Clause 15: The harness of any of clauses 1-14, wherein the first shoulder strap and the second shoulder strap have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components.

[0032] Clause 16. The harness of any of clauses 1-15, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0033] Clause 17: A fall protection harness removably wearable by a user, the harness having a plurality of straps comprising: an optional first leg strap an optional second leg strap, an optional belt strap, a first shoulder strap, and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap have an energy absorbing element integrated therewith, the energy absorbing element comprising a tubular webbing encasing a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are

subjected to a predetermined force, and wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

[0034] Clause 18: The harness of clause 17, wherein the first end of each leg strap is adjustably attached to the second end by a connection mechanism to adjust a length of each leg strap.

[0035] Clause 19: The harness of clause 17 or clause 18, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

[0036] Clause 20: In a harness removably attachable to a body of a user and having at least one strap comprising an energy absorbing element integrated with the at least one strap.

[0037] These and other features and characteristics of the present disclosure, as well as the methods of operation and functions of the related elements of structures and the combination of parts and economies of manufacture, will become more apparent upon consideration of the following description and the appended claims with reference to the accompanying drawings, all of which form a part of this specification, wherein like reference numerals designate corresponding parts in the various figures. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] **FIG. 1** is a front view of a harness in accordance with the principles of the present invention;

[0039] **FIG. 2** is a detailed perspective view of a shoulder harness having an energy absorbing element in accordance with the principles of the present invention;

[0040] **FIG. 3A** is a schematic representation of the energy absorbing element in a first configuration;

[0041] **FIG. 3B** is a schematic representation of the energy absorbing element in a second configuration;

[0042] **FIG. 4A** is a side cross-sectional view of an energy absorbing element in accordance with the principles of the present invention;

[0043] FIG. 4B is a top view of an energy absorbing element in accordance with the principles of the present invention; and

[0044] FIG. 4C is a top view of an energy absorbing element in accordance with the principles of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0045] For purposes of the description hereinafter, the terms “end”, “upper”, “lower”, “right”, “left”, “vertical”, “horizontal”, “top”, “bottom”, “lateral”, “longitudinal” and derivatives thereof shall relate to the invention as it is oriented in the drawing figures. However, it is to be understood that the invention may assume various alternative variations and step sequences, except where expressly specified to the contrary. It is also to be understood that the specific devices and processes illustrated in the attached drawings, and described in the following specification, are simply exemplary embodiments of the invention. Hence, specific dimensions and other physical characteristics related to the embodiments disclosed herein are not to be considered as limiting.

[0046] As used in the specification and the claims, the singular form of “a”, “an”, and “the” include plural referents unless the context clearly dictates otherwise. As used in the specification and the claims, the term “end” refers to the extreme distal portion or the area near or adjacent that portion. Unless otherwise specified, the use of the term “attach”, “attachable”, and/or “attachment” includes a permanent, semi-permanent, removable, or adjustable attaching arrangement. As used in the specification and the claims, the term “integrated”, when used with reference to an energy absorbing element and any portion of a harness, means that an energy absorbing element is formed as a separate component or arrangement and can be combined in, on, or with at least a portion of a separately formed harness (e.g., at least one strap or portion of a strap of the harness), such that the two components together constitute a whole. Therefore, the terms “therewith”, “therein”, and “thereon” are used interchangeably in the context of the present description. As used in the specification and the claims, the term “substantially parallel” means a relative angle as between two objects (if extended to theoretical intersection), such as elongated objects and including reference lines, that is from 0° to 5°, or from 0° to 3°, or from 0° to 2°, or from 0° to 1°, or from 0° to 0.5°, or from 0° to 0.25°, or from 0° to 0.1°, inclusive of the recited values.

[0047] As used in the specification and the claims, all ranges or ratios disclosed herein are to be understood to encompass any and all subranges or sub-ratios subsumed therein. For aspect or

embodiment, a stated range or ratio of “1 to 10” should be considered to include any and all subranges between (and inclusive of) the minimum value of 1 and the maximum value of 10; that is, all sub-ranges or sub-ratios beginning with a minimum value of 1 or more and ending with a maximum value of 10 or less, such as but not limited to, 1 to 6.1, 3.5 to 7.8, and 5.5 to 10.

[0048] In various preferred and non-limiting embodiments or aspects, and with reference to **FIGS. 1-3B**, the present disclosure is directed to a harness **100** used in a fall protection system. As discussed herein, the harness **100** has at least one structural energy absorbing element integrated therewith and made from a tearable webbing material configured for absorbing energy during a fall event. In various preferred and non-limiting embodiments or aspects, the harness **100** may be used in combination with a supplementary energy absorbing element, such as a self-retracting lanyard (SRL) (not shown), to provide additional energy absorption during a fall event.

[0049] With continued reference to **FIG. 1**, the harness **100** has at least two leg straps **102** configured to attach around a user's legs below a user's groin area. When attached, the leg straps **102** loop around or encircle each of the user's legs. Each leg strap **102** has a first end **102a** that is removably attachable to a second end **102b** via a connector **104**. In some preferred and non-limiting embodiments or aspects, the connector **104** may be a clip, a buckle, a mating arrangement, an actuatable structure, or the like. The connector **104** permits removable attachment of the first end **102a** to the second end **102b** of each leg strap **102**. In this manner, the first and second ends **102a**, **102b** of the leg straps **102** are configured to be removably attached to each other and configured to be free floating when detached from each other. In some preferred and non-limiting embodiments or aspects, at least one connector **104** and/or the leg strap **102** may have at least one connection mechanism **106** configured for adjusting the length of each leg strap **102**. In this manner, the at least one connection mechanism **106** adjusts a distance between the first end **102a** and the second end **102b** such that each leg strap **102** may be adjusted to fit comfortably around the user's legs. Each leg strap **102** may be formed from a substantially flat webbing material typically used in harness construction.

[0050] In various preferred and non-limiting embodiments or aspects of the present disclosure, the leg straps **102** (or, indeed, any of the straps in the harness **100**) may be linear lengths of material, folded straps that form loops with the at least one connector **104** at the first end **102a** and/or the second end **102b**, or the like. For example, as shown in **FIG. 1**, the connector **104** may have a first portion **104a** that is non-adjustably attached to the first end **102a** of at least one leg

strap **102**, while a second portion **104b** of the connector **104** is adjustably secured at the second end **102b** of at least one leg strap **102** through a loop of the material that makes up the leg strap **102**. Therefore, in such an arrangement, the second portion **104b** of the connector **104** and the loop of material that makes up the leg strap **102** at the second end **102b** defines the at least one connection mechanism **106** for adjusting a length of the leg strap **102**. It should be noted that the position of the connection mechanism **106** may be reversed such that the second portion **104b** of the connector **104** is provided on the first end **102a** of the leg strap **102**. At least one leg strap **102** may have padding (not shown) for increasing the user's comfort while wearing the harness **100**.

[0051] With continued reference to **FIG. 1**, each leg strap **102** is connected to a belt strap **110** at a substantially intermediate portion **102c** of the leg strap **102** between the first end **102a** and the second end **102b**. For example, each leg strap **102** may be connected to the belt strap **110**. In some preferred and non-limiting embodiments or aspects, the substantially intermediate portion **102c** of the leg strap **102** may be directly and non-movably connected to the belt strap **110**, such as being sewn directly to the belt strap **110**. In other preferred and non-limiting embodiments or aspects, the substantially intermediate portion **102c** of each leg strap **102** may be connected to the rear end of the belt strap **110** by a connection strap (not shown) to allow the substantially intermediate portion **102c** of the leg strap **102** to slidably move along a front portion of the leg strap **102**. Accordingly, the position of the leg straps **102** may be adjusted relative to the belt strap **110** to increase the user's comfort while wearing the harness **100**.

[0052] The belt strap **110** is configured to encircle at least a portion of the user's torso. The belt strap **110** has a first end **110a** that is attached to a first portion of a shoulder strap **126** and a second end **110b** that is attached to a second portion of the shoulder strap **126**. The first end **110a** and the second end **110b** may be removably or non-removably attachable to the shoulder strap **126**. In some embodiments or aspects, at least one of the first end **110a** and the second end **110b** may be attachable to the shoulder strap **126** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. In some preferred and non-limiting embodiments or aspects, the belt strap **110** may have at least one connection mechanism **106** configured for adjusting the length of the belt strap **110**. In this manner, the at least one connection mechanism **106** adjusts a distance between the first end **110a** and the second end **110b** such that the belt strap **110** may be adjusted to fit comfortably around the user's torso. One or more handle connection members, and other handling and/or connectors **120** may be provided on at least a portion of the

belt strap **110**. The belt strap **110** may have padding (not shown) for increasing the user's comfort while wearing the harness **100**. The belt strap **110** may be formed from a substantially flat webbing material typically used in harness construction.

[0053] With continued reference to **FIG. 1**, the harness **100** further has the shoulder strap **126** configured to extend over at least a portion of the user's shoulders. The shoulder strap **126** may have a first shoulder strap **126a** and a second shoulder strap **126b** arranged to overlap one another in an X-shaped configuration. In some preferred and non-limiting embodiments or aspects, the shoulder strap **126** may have at least one shoulder pad **131** having one or more openings through which the first shoulder strap **126a** and the second shoulder strap **126b** can be arranged to maintain the first shoulder strap **126a** and the second shoulder strap **126b** in the X-shaped configuration.

[0054] With specific reference to **FIG. 1**, the first shoulder strap **126a** has a first end **127a** that is connected to the second end **110b** of the belt strap **110**. The first end **127a** of the first shoulder strap **126a** may be removably or non-removably attachable to the second end **110b** of the belt strap **110**. In some preferred and non-limiting embodiments or aspects, the first end **127a** of the first shoulder strap **126a** may be attached to the second end **110b** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The first shoulder strap **126a** further has a second end **127b** that is connected to one of the two leg straps **102**. In some preferred and non-limiting embodiments or aspects, the second end **127b** of the first shoulder strap **126a** is connected to the leg strap **102** proximate to the second end **102b** of the leg strap **102**, such as by being sewn directly to the leg strap **102**. The first shoulder strap **126a** may have at least one loop **128** through which the first end **110a** of the belt strap **110** may be passed. At least a portion of the first shoulder strap **126a** may be formed from a substantially flat webbing material typically used in harness construction.

[0055] With continued reference to **FIG. 1**, the second shoulder strap **126b** has a first end **129a** that is connected to the first end **110a** of the belt strap **110**. The first end **129a** of the second shoulder strap **126b** may be removably or non-removably attachable to first end **110a** of the belt strap **110**. In some embodiments or aspects, the first end **129a** of the second shoulder strap **126b** may be attached to the first end **110a** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The second shoulder strap **126b** further has a second end **129b** that is connected to the other of the two leg straps **102**. In some preferred and non-limiting embodiments or aspects, the second end **129b** of the second shoulder strap **126b**

is connected to the leg strap **102** proximate to the second end **102b** of the leg strap **102**, such as by being sewn directly to the leg strap **102**. The second shoulder strap **126b** may have at least one loop **128** through which the second end **110b** of the belt strap **110** may be passed. At least a portion of the second shoulder strap **126b** may be formed from a substantially flat webbing material typically used in harness construction.

[0056] As shown in **FIG. 1**, the harness **100** may have a back strap **130** connecting a substantially intermediate portion of the first shoulder strap **126a** between its first end **127a** and second end **127b** with a substantially intermediate portion of the second shoulder strap **126b** between its first end **129a** and second end **129b**. A position of the back strap **130** may be adjustable along a longitudinal direction of each the first shoulder strap **126a** and the second shoulder strap **126b**, such as by sliding the back strap **130** along the first shoulder strap **126a** and/or the second shoulder strap **126b**.

[0057] The harness **100** further may have a chest strap **132** having a first end **132a** removably connectable to a second end **132b**. The first end **132a** of the chest strap **132** may be positioned proximate to the first end **127a** of the first shoulder strap **126a**, while the second end **132b** of the chest strap **132** may be positioned proximate to the first end **129a** of the second shoulder strap **126b**. The first end **132a** of the chest strap **132** is removably attachable to the second end **132b** via a connector, similar to the connector **104** described herein with reference to the leg straps **102**. In some preferred and non-limiting embodiments or aspects, the connector **104** may be a clip, a buckle, a mating arrangement, an actuatable structure, or the like. In this manner, the first and second ends **132a**, **132b** of the chest strap **132** are configured to be removably attached to each other and configured to be free floating when detached from each other. In some preferred and non-limiting embodiments or aspects, at least one of the back strap **130** and the chest strap **132** may have at least one connection mechanism, such as the connection mechanism **106** described herein with reference to the leg straps **102**. The connection mechanism **106** is configured for adjusting the length of the back strap **130** and/or the chest strap **132**. The back strap **130** and the chest strap **132** may be formed from a substantially flat webbing material typically used in harness construction.

[0058] With reference to **FIG. 2**, the shoulder strap **126** has an anchor element, such as a D-ring **138**, for connecting at least a portion of the shoulder strap **126** to a line connected to an anchor point. In some preferred and non-limiting embodiments or aspects, at least a portion of the first

shoulder strap **126a** and the second shoulder strap **126b** is looped around or otherwise permanently attached to the D-ring **138**. The D-ring **138** has a frame **140** defining at least one opening through which the first shoulder strap **126a** and the second shoulder strap **126b** may be looped around. In some preferred and non-limiting embodiments or aspects, the frame **140** of the D-ring **138** has a first opening **142** through which the first shoulder strap **126a** and the second shoulder strap **126b** extend. The D-ring further has a second opening **144** which may be used to secure the clip, such as a carabiner, of a lanyard or other rope or line between the harness **100** and the anchor point (or secure other items to the harness **100**).

[0059] In some preferred and non-limiting embodiments or aspects, the shoulder strap **126** has an energy absorbing element integrated therewith. In one preferred and non-limiting embodiment or aspect, at least one of the first shoulder strap **126a** and the second shoulder strap **126b** may be constructed from a tearable webbing material, such as an energy absorbing tear tape that is encased within a tubular webbing. In another preferred and non-limiting embodiment, and with reference to **FIG. 3A**, both the first shoulder strap **126a** and the second shoulder strap **126b** are made from a substantially flat webbing material **146** that is encased within a tubular webbing **147**. The substantially flat webbing material **146** may be completely encased within the tubular webbing **147**, except at a substantially intermediate portion of the first shoulder strap **126a** and the second shoulder strap **126b**, where at least a portion of the substantially flat webbing material **146** may be exposed (and exit) from the tubular webbing **147**. Of course, this exposure or exit point or area may be at any point along the length of the first shoulder strap **126a** and the second shoulder strap **126b**.

[0060] In some preferred and non-limiting embodiments or aspects, the substantially flat webbing material **146** may be exposed from the tubular webbing **147** through an opening **149** in the tubular webbing **147** in an area where the substantially flat webbing material **146** is connected to the D-ring **138**. As described herein, a first portion of the substantially flat webbing material **146** from each of the first shoulder strap **126a** and the second shoulder strap **126b** may be connected directly to the D-ring **138**, while a second portion of the substantially flat webbing material **146** bypasses the D-ring **138**. In this manner, the harness **100** does not differ externally from a conventional harness without the energy absorbing element, but incorporates the beneficial energy absorption element integrated into the harness **100**.

[0061] With reference to **FIGS. 3A-3B**, the first shoulder strap **126a** is illustrated. The second shoulder strap **126b** is omitted for simplicity of illustration. While the illustration of the second shoulder strap **126b** is omitted from **FIGS. 3A-3B**, construction and operation of the second shoulder strap **126b** is identical to that of the first shoulder strap **126a** in the embodiment or aspect where both shoulder straps **126a**, **126b** incorporate the tubular webbing **147** and/or energy absorbing element. Each of the first shoulder strap **126a** and a second shoulder strap **126b** may have the tubular webbing **147** arranged to overlap one another in an X-shaped configuration. The tubular webbing **147** of the first shoulder strap **126a** may have a first end that corresponds with the first end **127a** of the first shoulder strap **126a** (shown in **FIG. 1**). The first end of the tubular webbing **147** may be connected to the second end **110b** of the belt strap **110** in a removably or non-removably attachable manner. In some preferred and non-limiting embodiments or aspects, the first end of the tubular webbing **147** may be attachable to the second end **110b** of the belt strap **110** via a connector similar to the connector **104** described herein with reference to the leg straps **102**. The tubular webbing **147** further has a second end that corresponds to the second end **127b** of the first shoulder strap **126a** (shown in **FIG. 1**). The second end of the tubular webbing **147** may be connected to one of the two leg straps **102** in a removably or non-removably attachable manner. The tubular webbing **147** may be formed from webbing material that is woven into a tubular shape, or from flat webbing material wherein opposite lateral ends of the substantially flat webbing material are connected together to form the tubular shape of the tubular webbing **147**.

[0062] In various examples, the tubular webbing **147** may have an internal diameter of about 0.5 inches to about 2.0 inches. In various embodiments or aspects, a longitudinal length of the tubular webbing **147** may be between about 24 inches to about 90 inches. The opening **149** in the tubular webbing **147** may be formed at a substantially intermediate point between the first end **127a** and the second end **127b** of the first shoulder strap **126a** (and/or the second shoulder strap **126b**). In some preferred and non-limiting embodiments or aspects, the opening **149** may be formed at a rear portion of the harness **100** at an upper portion of a user's back. In this manner, the opening **149** allows the substantially flat webbing material **146** to be exposed such that the substantially flat webbing material **146** may be connected to the D-ring **138**. The opening **149** may be formed as a slit in the tubular webbing **147** having a length between about 0.5 inches to about 2.0 inches. In one preferred and non-limiting embodiment, and upon activation of the energy absorbing element, e.g., the flat webbing material **146**, at least a portion of the energy absorbing

element is configured to exit through the opening **149** of the tubular webbing **147** upon tearing, thereby facilitating the complete (if necessary) separation of the flat webbing material **146**. Further, it is envisioned that the opening **149** may be reinforced wholly or partially around its edges to ensure that the tubular webbing **147** does not rip or tear during a fall event.

[0063] With continued reference to **FIGS. 3A-3B**, the substantially flat webbing material **146** of the first shoulder strap **126a** has two webbing components **146a**, **146b** (which may be load-bearing webbing components) that are woven together by binder threads **148**. In some embodiments or aspects, the webbing material **146** may have a plurality of load-bearing webbing components. The webbing components **146a**, **146b** may each be typically made from a two ply webbing material constructed from high tenacity polyester or nylon yarns. Each webbing component **146a**, **146b** may have a face ply and a back ply. The webbing components **146a**, **146b** may be superimposed over one another such that the back ply of one of the webbing components **146a**, **146b** is positioned over the face ply of the other of the webbing components **146a**, **146b**. The webbing components **146a**, **146b** and the binder threads **148** are woven together to constitute a single-piece webbing material, i.e., the first shoulder strap **126a** and the second shoulder strap **126b**. While the present disclosure describes binder threads **148** as a means of integrally bonding the webbing components **146a**, **146b** together, other suitable bonding means, such as hook-and-loop fasteners, adhesives, or other energy absorbing materials may also be used, either individually or in combination with the binder threads **148**.

[0064] When the energy absorbing element is activated, such as during a fall event, the binder threads **148** are configured to be torn upon experiencing a force in excess of a predetermined force, thereby allowing the two webbing components **146a**, **146b** to tear apart from each other, such as shown in **FIG. 3B**. In some embodiments or aspects, the predetermined force (load) may be in the range of about 310 lbs to about 2,250 lbs. The binder threads **148** are configured to absorb energy (force) of a user falling during a fall event by fracturing (or tearing/separating) and allowing the webbing components **146a**, **146b** to separate from each other. The tearing of the binder threads **148** may be initiated by a minimum predetermined force (load), such as about 310 lbs. The tearing of the binder threads **148**, and a consequent separation of the webbing components **146a**, **146b** continues as long as the force on the harness **100** exceeds the minimum predetermined force and ends when either (1) the webbing components **146a**, **146b** reach an ending point; or (2) the force reduces to a point below the minimum predetermined force. In various embodiments or aspects,

the shoulder strap **124** may be configured to tear the webbing components **146a**, **146b** apart from each other due to breaking of the binder threads **148** at a constant force. The minimum predetermined force (load) required to break the binder threads **148** may be configurable by increasing or decreasing the density of the binder threads **148** per unit area, increasing or decreasing the width of the shoulder strap **124**, increasing or decreasing the density of the binder threads **148** along a longitudinal length and/or a lateral length of the shoulder strap **124**, and/or selecting a type of thread having specified strength characteristics.

[0065] As discussed above, and in another preferred and non-limiting embodiment or aspect, the webbing components **146a**, **146b** may be bound together by an adhesive, such as glue, that separates when reaching the minimum predetermined force or load. It is recognized that these adhesives may be specifically formulated to meet the separation requirements at the minimum predetermined force or load.

[0066] With reference to **FIG. 4A**, the binder threads **148** may extend through at least a portion of a thickness of at least one of the webbing components **146a**, **146b**. For example, the binder threads **148** may extend between the face ply and the back ply of each of the webbing components **146a**, **146b**. In some embodiments or aspects, such as shown in **FIG. 4A**, the binder threads **148** extend through the entire thickness of each of the webbing components **146a**, **146b**. With reference to **FIG. 4B**, the binder threads **148** may be woven in two or more rows **153** extending along a longitudinal length and/or a lateral length of the webbing components **146a**, **146b**. In various preferred and non-limiting embodiments or aspects, the rows **153** may be substantially parallel to each other, or intersect at least once with each other along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**. With reference to **FIG. 4C**, the binder threads **148** may be arranged in a plurality of thread groups **151** arranged in a pattern on the webbing components **146a**, **146b**. In some preferred and non-limiting embodiments or aspects, the density of thread groups **151** may be constant along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**. In this manner, the webbing components **146a**, **146b** will separate from one another due to breaking of the binder threads **148** at a constant rate at a given force that exceeds the minimum predetermined force. In other preferred and non-limiting embodiments or aspects, the density of thread groups **151** may vary along the longitudinal length and/or the lateral length of the webbing components **146a**, **146b**, such as by increasing or decreasing the density of the thread groups **151**. Accordingly, the webbing components **146a**,

146a will separate from one another due to breaking of the binder threads **148** at an increasing or decreasing rate at a given force that exceeds the minimum predetermined force. The arrangement of the thread groups **151** may be selected to optimize the tear-away force required to break the binder threads **148** (or adhesive) during separation of the webbing components **146a**, **146b** from each other. In various preferred and non-limiting embodiments or aspects, the binder threads **148** extend continuously between the webbing components **146a**, **146b** in a sinusoidal manner. The binder threads **148** may be made from high tenacity polyester yarns, nylon, or other suitable materials. The tensile strength of the binder threads **148** is desirably selected to be less than that of the webbing components **146a**, **146b** to allow the binder threads **148** to tear without tearing the webbing components **146a**, **146b**.

[0067] With reference to **FIG. 3A**, the first shoulder strap **126a** may have a starting tear point **150** at which the two webbing components **146a**, **146b** are not bound by the binder threads **148**. The starting tear point **150** may be defined at a substantially intermediate portion of the first shoulder strap **126a** between the first end **127a** and the second end **127b**. After the starting tear point **150**, the webbing components **146a**, **146b** are integrally woven together. With reference to **FIG. 3B**, as the user falls during a fall event, the binder threads **148** start to fracture (or tear) at the starting tear point **150** and continue tearing along the longitudinal length of an energy absorbing area **152** of the shoulder strap **126** that ties the webbing components **146a**, **146b** with the binder threads **148**. The binder threads **148** are configured to tear successively along the longitudinal length of the bound absorbing area **152** beginning from the starting tear point **150**. The successive tearing of the binder threads **148** absorbs energy of the fall, thereby safely decelerating the user and reducing the shock transferred to the user's body as the user's weight is borne by the harness. Further, at least a portion of the webbing components **146a**, **146b** exit from the tubular webbing **147** through the opening **149**.

[0068] With continued reference to **FIG. 3B**, the first shoulder strap **126a** may have an ending tear point **154** at an end of the energy absorbing area **152**. The ending tear point **154** may have a reinforced area **156**, such as by additional stitching, to prevent further tearing of the webbing components **146a**, **146b**. Once activated, the two webbing components **146a**, **146b** support the user's weight, such as with one of the webbing components **146a**, **146b** being connected to the D-ring **138**, and the other of the two webbing components **146a**, **146b** supporting the user's shoulders. The tearing of the two webbing components **146a**, **146b** due to breaking of the binder

threads **148** may end prior to the ending tear point **154** if the force on the harness is reduced below the minimum predetermined force necessary to tear the binder threads **148**.

[0069] The shoulder strap **126** having an energy absorbing element integrated therewith, such as the two webbing components **146a**, **146b** bound by binding threads **148**, reduces the risk of misuse, especially in leading edge applications where the user may incorrectly attach an integrated energy absorbing element to a conventional harness. A harness **100** having such a shoulder strap **126** eliminates the need for a structural back-up strap as the tear tape maintains the static strength of structural webbing at full elongation (end of deployment shown in **FIG. 5C**). In this manner, the harness **100** does not differ externally from a conventional harness without the energy absorbing element, but incorporates the beneficial energy absorption element integrated into the harness **100**.

[0070] Although the invention has been described in detail for the purpose of illustration based on what is currently considered to be the most practical and preferred embodiments, it is to be understood that such detail is solely for that purpose and that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover modifications and equivalent arrangements that are within the spirit and scope of the appended claims. For example, it is to be understood that the present invention contemplates that, to the extent possible, one or more features of any embodiment can be combined with one or more features of any other embodiment.

What is claimed is:

1. A wearable harness having a plurality of straps comprising:
a first shoulder strap and a second shoulder strap, wherein at least one of the first shoulder strap and the second shoulder strap comprises a tubular webbing; and
an energy absorbing element integrated with at least one of the first shoulder strap and the second shoulder strap,
wherein the energy absorbing element is at least partially encased within the tubular webbing and comprises a tearable webbing material with at least two bound webbing components configured to tear from one another when the first shoulder strap and the second shoulder strap are subjected to a force that exceeds a predetermined threshold during a fall event.
2. The harness of claim 1, wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.
3. The harness of claim 1, wherein the energy absorbing element is exposed from the tubular webbing through an opening in the tubular webbing.
4. The harness of claim 3, wherein at least a portion of the energy absorbing element is configured to exit through the opening of the tubular webbing upon tearing.
5. The harness of claim 1, wherein the tubular webbing comprises a substantially flat webbing material having opposing lateral ends connected to one another to define a tubular shape.
6. The harness of claim 1, wherein the at least two bound webbing components are bound by a plurality of binder threads.

7. The harness of claim 6, wherein the plurality of binder threads are configured to tear successively in a longitudinal direction of at least one of the first shoulder strap and the second shoulder strap when the at least one of the first shoulder strap and the second shoulder strap is subjected to the force that exceeds the predetermined threshold.

8. The harness of claim 6, wherein the plurality of binder threads extend through at least a portion of a thickness of the at least two webbing components.

9. The harness of claim 6, wherein the plurality of binder threads are arranged in two or more substantially parallel or intersecting rows extending along a longitudinal length or a lateral length of the webbing components.

10. The harness of claim 6, wherein the plurality of binder threads are arranged in two or more thread groups arranged in a pattern and spaced apart from each other along a longitudinal length or a lateral length of the webbing components.

11. The harness of claim 1, wherein the predetermined threshold is in a range of about 310 lbs to about 2,250 lbs.

12. The harness of claim 1, wherein the at least two bound webbing components are bound together by an adhesive.

13. The harness of claim 1, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the pair of bound webbing components is unbound.

14. The harness of claim 1, wherein the first shoulder strap and the second shoulder strap have an ending tear point having a reinforced area configured to prevent separation of the at least two bound webbing components.

15. The harness of claim 1, wherein the energy absorbing element is located on an energy absorbing area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

16. A fall protection harness removably wearable by a user, the harness having a plurality of straps comprising:

a first shoulder strap and a second shoulder strap comprising a tubular webbing, wherein at least one of the first shoulder strap and the second shoulder strap have an energy absorbing element integrated therewith and at least partially encased within the tubular webbing, the energy absorbing element comprising a tearable webbing material with at least two bound webbing components bound together by a plurality of binder threads configured to tear successively in a longitudinal direction of the first shoulder strap and the second shoulder strap when the first shoulder strap and the second shoulder strap are subjected to a predetermined force during a fall event, and

wherein the energy absorbing element is exposed from the tubular webbing at a substantially intermediate portion of at least one of the first shoulder strap and the second shoulder strap between the first end and the second end of the at least one of the first shoulder strap and the second shoulder strap.

17. The harness of claim 16, wherein the first shoulder strap and the second shoulder strap have a starting tear area at a rear portion where the at least two bound webbing components are unbound.

18. The harness of claim 16, wherein the energy absorbing element is located on an area at a rear portion of at least one of the first shoulder strap and the second shoulder strap.

19. In a harness removably attachable to a body of a user and having at least one strap comprising:

an energy absorbing element integrated with the at least one strap, wherein the energy absorbing element is at least partially encased with a tubular webbing of the at least one strap and comprises a tearable webbing material with at least two

bound webbing components configured to tear from one another when the at least one strap is subjected to a force that exceeds a predetermined threshold during a fall event.

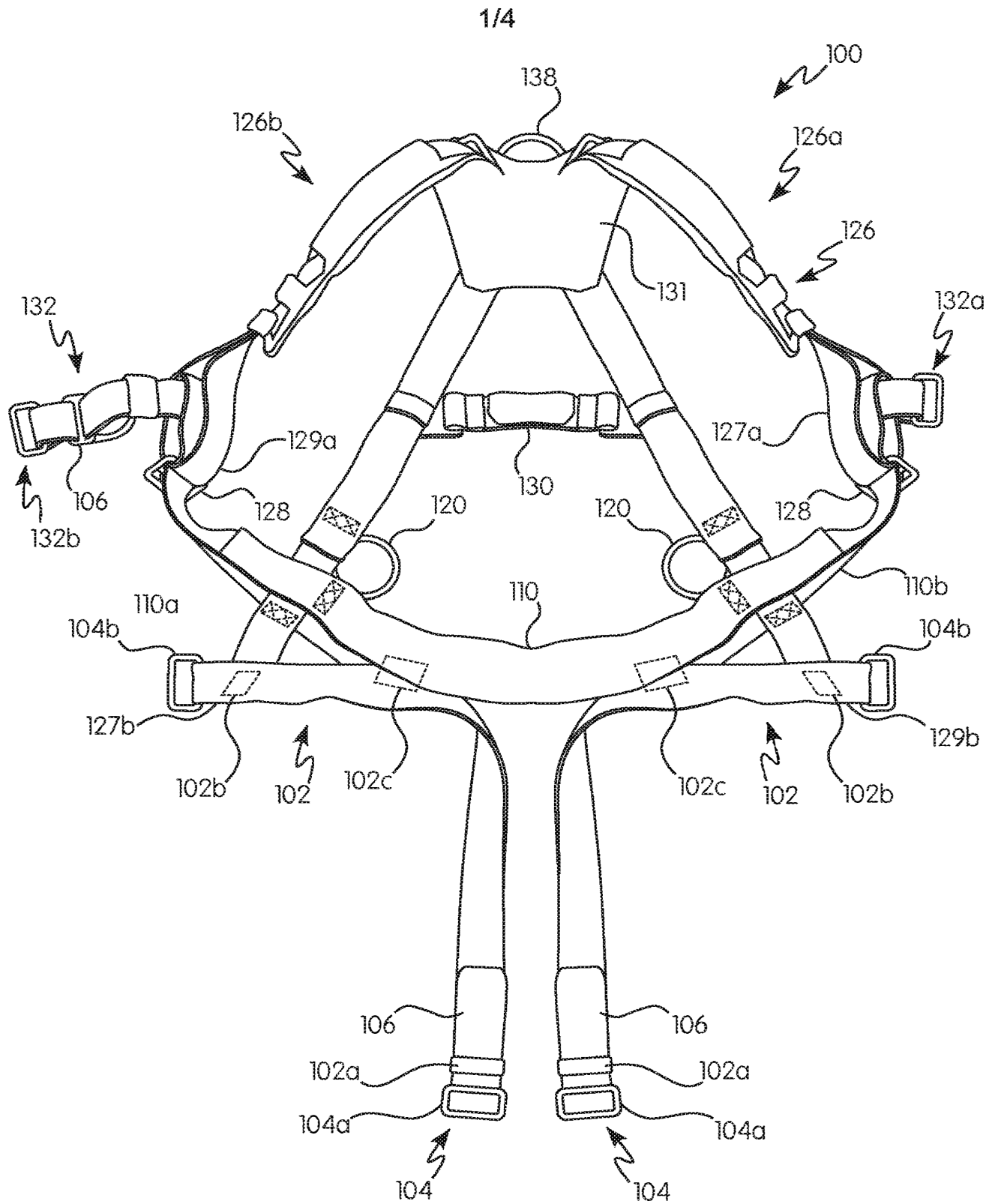


FIG. 1

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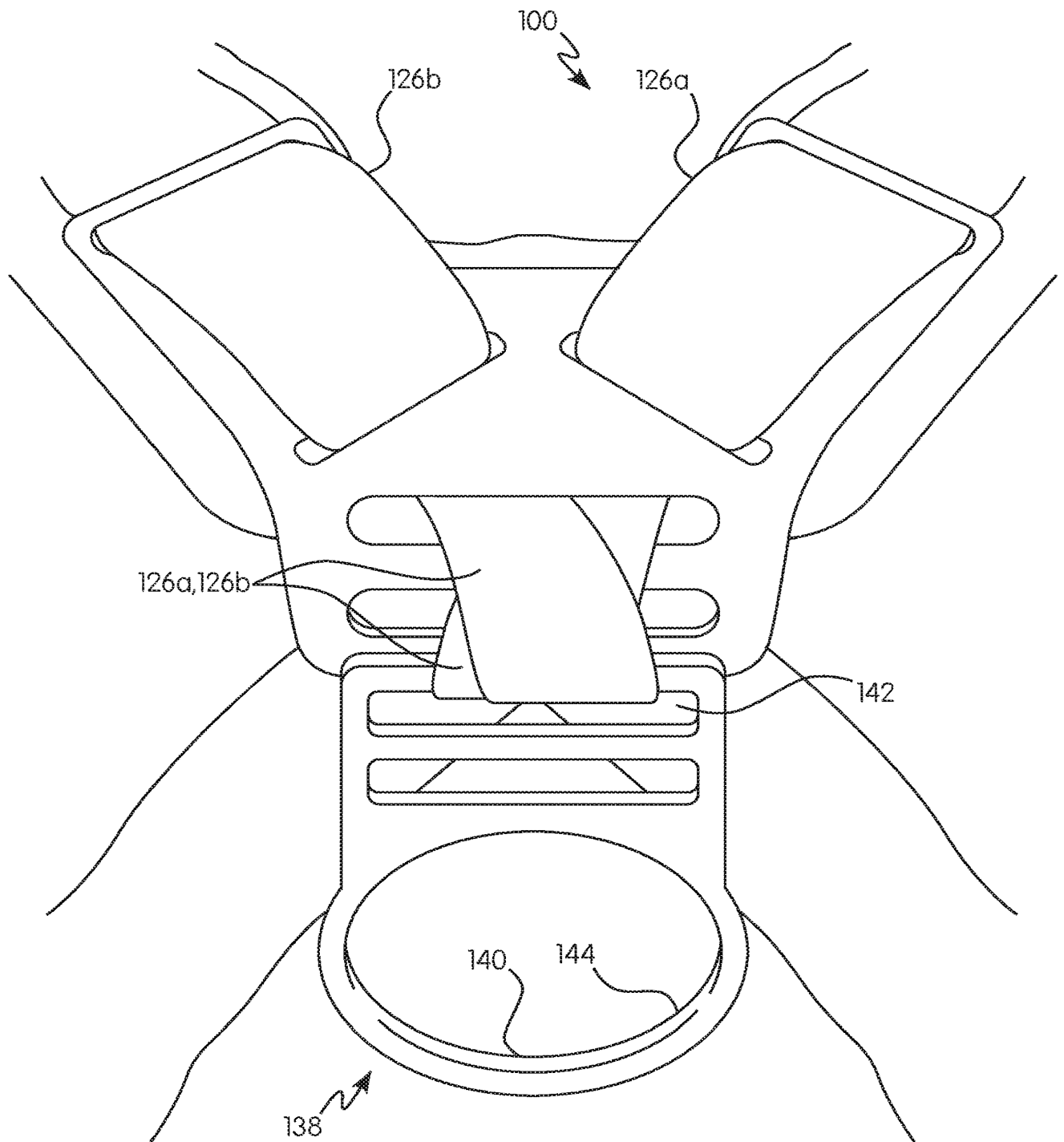


FIG. 2

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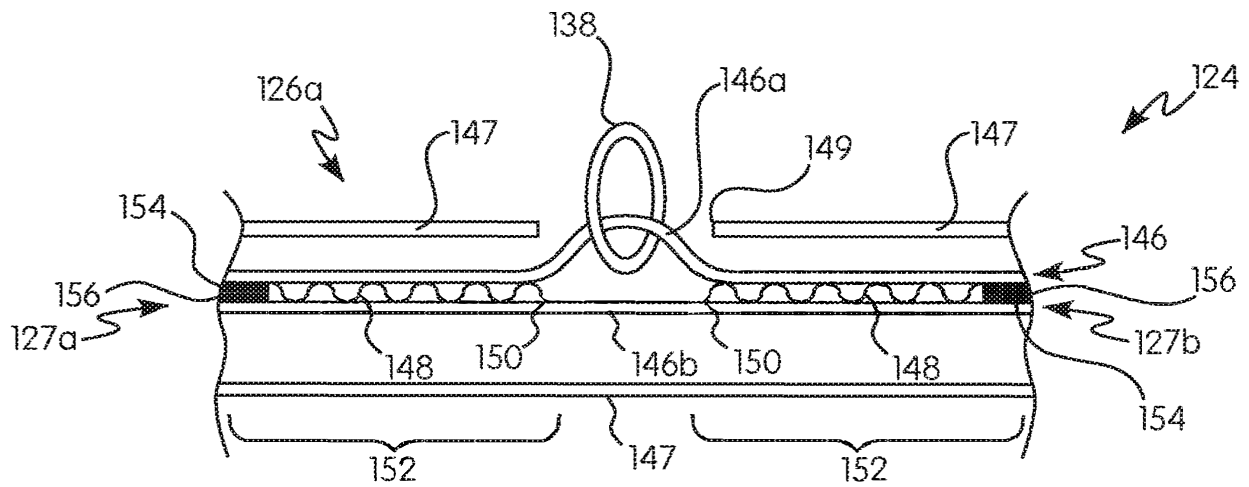


FIG. 3A

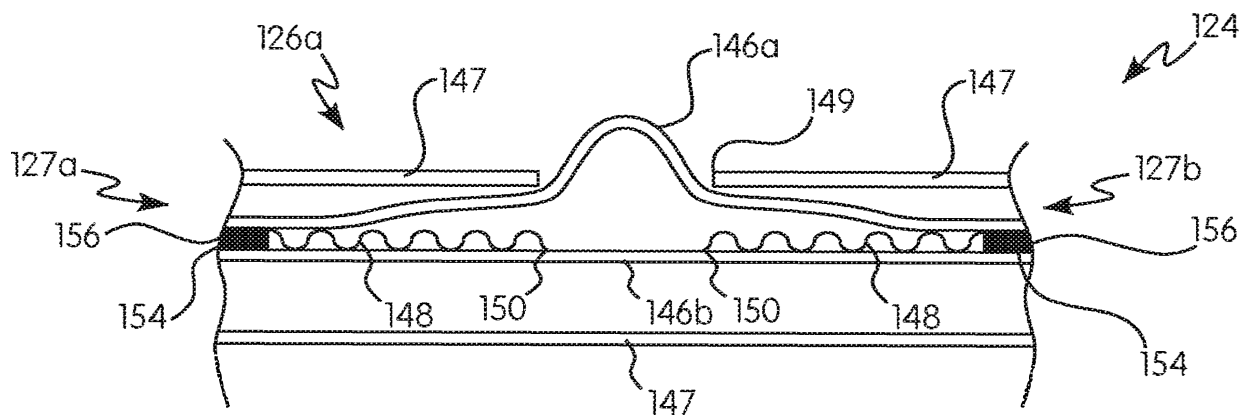


FIG. 3B

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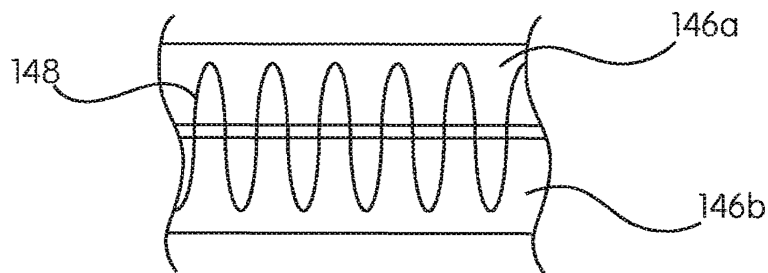


FIG. 4A

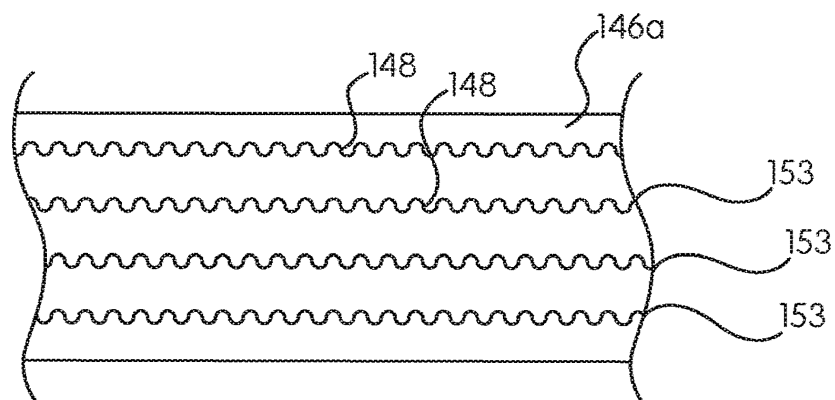


FIG. 4B

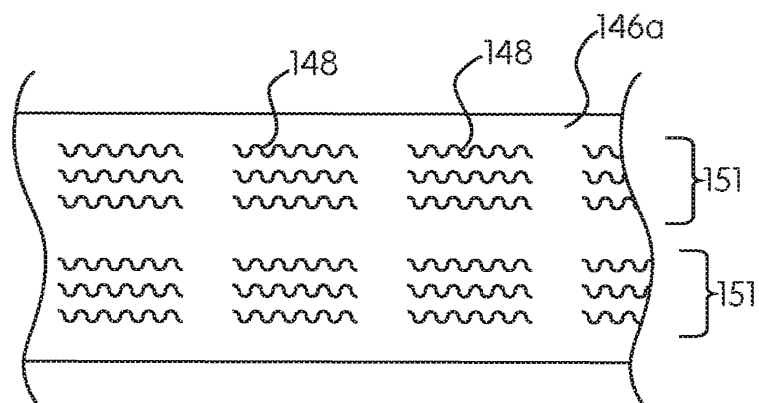


FIG. 4C

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2017/064684

A. CLASSIFICATION OF SUBJECT MATTER

INV. A62B35/00 A62B35/04
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A62B

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 8 584 799 B1 (DENNINGTON MARK [US]) 19 November 2013 (2013-11-19) figures -----	19 1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

13 February 2018

Date of mailing of the international search report

20/02/2018

Name and mailing address of the ISA/

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Authorized officer

Andlauer, Dominique

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/064684

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8584799	B1	19-11-2013	NONE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number

Filing Date

First Named Inventor

Walter Ernest Power II

Art Unit

Examiner Name

Attorney Docket Number

TETH143.03

U.S.PATENTS

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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	8061479		2011-11-22	Harris Jr.	
	2	8292028		2012-10-23	Wise	
	3	8356691		2013-01-22	Griffith	
	4	8584799		2013-11-19	Dennington	
	5	9320925		2016-04-26	Wise	
	6	9808659		2017-11-07	Chevalier	
	7	10258814		2019-04-16	Casebolt	
	8	11504556		2022-11-22	Power II	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

U.S.PATENT APPLICATION PUBLICATIONS							Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	
	1	20080179136		2008-07-31	Griffith		
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	1	WO2018111624	WO		2018-06-21	Jacob		☐	

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(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

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	
Filing Date	
First Named Inventor	Walter Ernest Power II
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

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	/brendandix/	Date (YYYY-MM-DD)	2024-05-21
Name/Print	Brendan B. Dix	Registration Number	37,313

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:

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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.
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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.
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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****BRIDGE ROPE ASSEMBLY**

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.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTORInventor: **Walter Ernest Power II**

Date (Optional):

5/21/2024

Signature:



Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 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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BRIDGE ROPE ASSEMBLY

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The attached application, or

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filed on _____.

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

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LEGAL NAME OF INVENTORInventor: Gregory Alan Godfrey

Date (Optional):

5-21-2014

Signature: _____



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LEGAL NAME OF INVENTORInventor: Shawn Paul ChadwickDate (Optional): 21 May 2024Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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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
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LEGAL NAME OF INVENTORInventor: Carl Eugene Kossuth IIIDate (Optional): 05/21/2024Signature: Carl E Kossuth III

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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Application Number	
Filing Date	
First Named Inventor	Walter Ernest Power II
Title	BRIDGE ROPE ASSEMBLY
Art Unit	
Examiner Name	
Attorney Docket Number	TETH143.03

SIGNATURE of Applicant or Patent Practitioner

Signature	/seankaufhold/	Date (Optional)	2024-05-19
Name	Sean A. Kaufhold	Registration Number	46.820
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.			
☐ *Total of _____ forms are submitted.			

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

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I hereby appoint the Patent 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 (form PTO/AIA/82A) or identified above:

44088

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) 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 patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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OR

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Individual Name

Address

City

State

Zip

Country

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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Tethrd, LLC



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



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) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

5/21/2024

Name

Walter Ernest Power II

Title

C.O.O. Tethrd, LLC

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Walter	Ernest	Power	II	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Columbia	State/Province	TN	Country of Residence	US
Mailing Address of Inventor:					
Address 1	2409 Pulaski Hwy				
Address 2					
City	Columbia	State/Province	TN		
Postal Code	38401	Country	US		
Inventor 2					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Gregory	Alan	Godfrey		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Richmond Hill	State/Province	GA	Country of Residence	US
Mailing Address of Inventor:					
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	Carl	Eugene	Kossuth	III	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Ex. 1151

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

City	Rolla	State/Province	MO	Country of Residence	US
------	-------	----------------	----	----------------------	----

Mailing Address of Inventor:

Address 1	10557 CR3600				
Address 2					
City	St. James	State/Province	MO		
Postal Code	65559	Country	US		

Inventor 4	Remove
Legal Name	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Shawn	Paul	Chadwick	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Merrill	State/Province	WI	Country of Residence	US

Mailing Address of Inventor:

Address 1	138624 Rainbow Drive				
Address 2					
City	Merrill	State/Province	WI		
Postal Code	55452	Country	US		

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

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).					
☐ An Address is being provided for the correspondence Information of this application.					
Customer Number	44088				
Email Address		Add Email	Remove Email		

Application Information:

Title of the Invention	Bridge Rope Assembly			
Attorney Docket Number	TETH143.03	Small Entity Status Claimed ☒		
Application Type	Nonprovisional			
Subject Matter	Utility			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

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.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

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

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16736345	2020-01-07

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		TETH143.03	
		Application Number			
Title of Invention		Bridge Rope Assembly			
Prior Application Status		Abandoned		Remove	
Application Number		Continuity Type		Filing or 371(c) Date (YYYY-MM-DD)	
17231717		Continuation of		2021-04-15	
Prior Application Status		Abandoned		Remove	
Application Number		Continuity Type		Filing or 371(c) Date (YYYY-MM-DD)	
17867553		Continuation in part of		2022-07-18	
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
18602822	Continuation of	17867553	2022-07-18	11504556	2022-11-22
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button. Add					

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number		Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
Remove				
Additional Foreign Priority Data may be generated within this form by selecting the Add button. Add				

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	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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:

If the Applicant is an Organization check here. ☒

Organization Name Tethrd LLC

Mailing Address Information For Applicant:

Address 1	2409 Pulaski Hwy		
Address 2			
City	Columbia	State/Province	TN
Country	US	Postal Code	38401
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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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

Tethrd LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1		2409 Pulaski Hwy	
Address 2			
City	Columbia	State/Province	TN
Country ⁱ	US	Postal Code	38401
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	/brendanbdix/		Date (YYYY-MM-DD)	2024-05-21
First Name	Brendan B.	Last Name	Dix	Registration Number
				37313

Additional Signature may be generated within this form by selecting the Add button.

Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	TETH143.03
		Application Number	
Title of Invention	Bridge Rope Assembly		

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.

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e) (Page 1 of 1)**

First Named Inventor:	Walter Ernest Power II	Nonprovisional Application Number (if known):	
Title of Invention:	Bridge Rope Assembly		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

- i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.
---OR---
(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
- ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature	/seankaufhold/	Date	05/22/2024
Name (Print/Typed)	Sean A. Kaufhold	Practitioner Registration Number	46820
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*			
☒ *Total of <u>1</u> 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.
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.



ELECTRONIC PAYMENT RECEIPT

APPLICATION #
18/671,581

RECEIPT DATE / TIME
05/22/2024 05:11:38 PM Z ET

ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

PATENT # -

CONFIRMATION # 5913

FILED BY Sara Egge

PATENT CENTER # 65635168

AUTHORIZED BY Brendan Dix

CUSTOMER # 44088

FILING DATE -

CORRESPONDENCE
ADDRESS -

FIRST NAMED
INVENTOR Walter Ernest Power II

Payment Information

PAYMENT METHOD
CARD / 3990

PAYMENT TRANSACTION ID
E20245LH13029866

PAYMENT AUTHORIZED BY
Sara Egge

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	56.00	1	56.00
2817	REQUEST FOR PRIORITIZED EXAMINATION	1680.00	1	1680.00
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				\$2,400.00

AMOUNT:

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.

(a) TITLE OF THE INVENTION

BRIDGE ROPE ASSEMBLY

(b) CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part and I claim the benefit of U.S. Application No. 16/736,345, now abandoned, filed on January 7th, 2020, U.S. Application No. 17/231,717 filed on April 15th, 2021 issued as U.S. Pat. No. 11,504,556, and pending U.S. Application No. 17/867,553 filed on July 18th, 2022, and pending U.S. Application No. 18/602,822 filed on March 12, 2024.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

Not Applicable

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC OR AS A TEXT FILE VIA THE OFFICE ELECTRONIC FILING SYSTEM.

Not Applicable

(f) STATEMENT REGARDING PRIOR DISCLOSURES BY THE INVENTOR OR JOINT INVENTOR

Not Applicable

(g) BACKGROUND OF THE INVENTION

(1) Field of the Invention.

The disclosure relates to harness rope structures and more particularly pertains to a new harness rope structures for utilizing eye splices having fully buried rope ends which extend completely into their mating counterparts a sufficient distance such that a double layer of rope is created. It has been found that such a construction allows high strength materials that are otherwise susceptible to heat/friction damage, or are of such low friction that they do not typically retain a closed loop formation under stress, to be used safely for harness bridge ropes.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

The prior art relates to harness ropes which are generally conventional and utilize rope materials that are of inferior strength but which have a higher coefficient of friction and a higher weight to strength ratio.

(h) BRIEF SUMMARY OF THE INVENTION

An embodiment of the disclosure meets the needs presented above by generally comprising a main body including a rope that has a first end and a second end. The rope has a splice therein to form an eye loop in the main body. The eye loop is configured to engage a first bridge loop of a harness. The main body comprises a first portion including the first end and a second portion including the second end. The first portion extends through the second portion of the main body such that the first end is positioned adjacent to the second end. A distance between the first and second ends is less than 2.0 inches.

There has thus been outlined, rather broadly, the more important features of the disclosure in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the disclosure that will be described hereinafter and which will form the subject matter of the claims appended hereto.

The objects of the disclosure, along with the various features of novelty which characterize the disclosure, are pointed out with particularity in the claims annexed to and forming a part of this disclosure.

(i) BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWING(S)

The disclosure will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

Figure 1 is a front view of a main body of a bridge rope assembly according to an embodiment of the disclosure.

Figure 2 is a front view of a closed loop of an embodiment of the disclosure.

Figure 3 is a front in-use view of an embodiment of the disclosure.

Figure 4 is a front in-use view of an embodiment of the disclosure.

Figure 5 is a side in-use view of an embodiment of the disclosure.

Figure 6 is a front view of a rope used in forming a main body of an embodiment of the disclosure.

Figure 7 is a front view of a step in forming the main body of an embodiment of the disclosure.

Figure 8 is a front view of a single rope used in forming a friction hitch of an embodiment of the disclosure

Figure 9 is a front view of a step in forming a continuous loop of an embodiment of the disclosure.

Figure 10 is a front view of the continuous loop of an embodiment of the disclosure.

Figure 11 is a cross-sectional view taken along line 11-11 of Figure 10 of an embodiment of the disclosure.

Figure 12 is a view of a step in forming a releasable engagement of an embodiment of the disclosure.

Figure 13 is a view of a step in forming a releasable engagement of an embodiment of the disclosure.

Figure 14 is a view of a step in forming a releasable engagement of an embodiment of the disclosure.

Figure 15 is a view of a completed releasable engagement of an embodiment of the disclosure.

Figure 16 is a view of a releasably-engaged bridge rope assembly of an embodiment of the disclosure.

(j) DETAILED DESCRIPTION OF THE INVENTION

With reference now to the drawings, and in particular to Figures 1 through 16 thereof, a new harness rope structure embodying the principles and concepts of an embodiment of the disclosure and generally designated by the reference numeral 10 will be described.

As best illustrated in Figures 1 through 16, the bridge rope assembly 10 generally includes a main body 12, as shown in Figures 1, 4, 6 and 7, comprising a rope 14 that has a first end 16 and a second end 18. The main body 12 has a splice 20 therein to form an eye loop 22 in the main body 12. The splice 20 may be a straight splice or a locked brummel splice. Each is well known in the art of rope manipulation within the harness arts. Generally, a locked brummel splice may be preferred as any buried tags (portions of rope extended within another portion of rope) cannot back themselves out as they are effectively “locked” in place with a knot. A downside of the locked brummel is the knot itself at the splice 20 which creates a bulge in the rope where the knot is formed. Buried tags that are the product of a straight splice are not locked in place and therefore can back themselves out when not under tension. However, a straight splice can be secured in place by stitching the resultant tag(s) in place once the tag is in a buried condition if desired. Generally, as it will be understood below, it is the splice 20 which creates one or two tags which is important.

The eye loop 22 is configured to engage a first bridge loop 24 of a harness 26 utilized to support a person 28 secured to a tree 30. After the formation of the eye loop, the main body 12 comprises a first portion 32 including the first end 16 and a second portion 34 including the second end 18. The first portion 32 is then extended through the second portion 34 of the main body 12 by threading the first end 16 into the second portion 34 adjacent to the eye loop 22. The first end 16 of a conventional buried tag, i.e. first portion 32, is typically retained within the second portion 34 in close proximity to the eye loop 22. However, in the current disclosure, the eye loop 22 is positioned proximate a central area of the rope 14 such that the first end 16 can be extended adjacently to the second end 18, wherein the first 32 and second 34 portions each extend away from the eye loop 22. The first end 16 will typically remain within the second portion 34 and will be located less than 2.0 inches from the second end 18.

The main body 12 includes a stop knot 36 in the second portion 34 adjacent to the second end 18 and therefore the stop knot 36 further includes the first portion 32 adjacent

to the first end 16. The stop knot 36 may comprise, for example, a double fisherman's knot.

The juncture of the first 16 and second 18 ends may be covered with a securing member or otherwise bonded together with known methods and/or mechanical structures. These may include mechanical stitching, staples, glue, friction/heat bonding and the like. One type of securing member may comprise a heat shrink wrap sleeve having an interior coated with an adhesive to ensure a strong bond between the sleeve and the main body 12. The sleeve will extend in opposite directions away from a juncture of the first end 16 and the second portion 34 to ensure that the first end 16 does not move relative to the second portion 34 and protects the juncture from damage, such as for example from fraying. After the shrink wrap is heated and adhered to the second portion 34, the extra length of section portion 34 extending beyond the first end 16 may be removed such that the first 16 and second 18 ends are flush with each other.

The rope 14 may have a length from the first end 16 to the second end 18 between 72.0 inches and 126.0 inches. The main body 12 may further comprise a 0.25 inch braided rope though other rope diameters are contemplated with the width being typically less than 0.50 inches and generally at least 0.1875 inches. The second end 18 extends away from the eye loop 22 between 0.5 inches and 3.0 inches farther away than the first end 16 extends away from the eye loop 22, and more preferably less than 2.0 inches farther away. It should be understood that the first end 16 may extend outwardly of the second portion 34 a short distance and either be trimmed back such that it is flush with or within 1.0 inches of the second end 18 and thereafter secured in place. The burying of the first portion 32 within the second portion 34 may be facilitated with conventional threading/splicing tools 35. Increased friction between the first 32 and second 34 portions due to the increased diameter of the second portion 34 prevents movement of the first 32 and second 34 portions relative to each other to minimize mechanical failure. The increased diameter of the second portion 34 will also result in increased friction between the main body 12 and a friction hitch positioned on the main body 12. This

minimizes mechanical failure of the bridge rope assembly 10 during standardized drop testing.

The main body 12 is comprised of a polyethylene, and in particular ultra high molecular weight polyethylene, typically known as UHMWPE. This material characteristically includes extremely long chains of polyethylene having 100,000 to 250,000 monomer units per molecule. Such material is available from numerous suppliers. One such material is sold under the trademark *Amsteel*. *Amsteel* is a trademark of Samson Rope Technologies, Inc. located at 2090 Thorton Street, Ferndale, WA. This material may be blended with other materials; however, the rope may consist solely of UHMWPE. UHMWPE, while extremely strong, has a very low coefficient of friction. Therefore the extension of the first portion 32 through the second portion 34 further resists the movement of the first portion 32 outwardly away from the second portion 34 while increasing a thickness of main body 12 such that it may be gripped easier.

In one embodiment, the main body 12 comprises a rope that is 95.0 inches long and is comprised of 0.25 inch diameter *Amsteel*. A splice 20 is created and a locked brummel used such that a 39.0 inch tag line (first portion 32) is formed which is buried into what will be an approximately 50.0 inch remainder (second portion 34) of the rope 14. The widening of the second portion 34 to accept the first portion 32 causes the second portion 34 to shorten in length which allows the first portion 32 to nearly extend through the second portion 34. Shrink wrap 40 is then applied over the second 34 portion at a juncture of the first end 16 and second portion 34. It is heated to form a bond with the second portion 34 and compresses the first 32 and second 34 portions together. After the shrink wrap is heated and adhered to the second portion 34, the extra length of the second portion 34 extending beyond the first end 16 may be removed such that the first 16 and second 18 ends are flush with each other. The stop knot 36 is formed in the main body 12 adjacent to the shrink wrap 40 by way of a double fisherman's knot. The distance from the stop knot 36 to the eye loop 22 is approximately 31.0 inches.

A friction hitch 42, as shown particularly in Figures 2, 4, and 9-11, is positioned on the main body 12 between the stop knot 36 and the eye loop 22. The friction hitch 42 is formed in a conventional manner and is configured to engage a second bridge loop 44 of the harness 26. The friction hitch 42 comprises a closed loop 46. The closed loop 46 is comprised of a single rope 48 that is formed into a continuous splice using a conventional method except wherein a pair of ends (first end 50 and second end 52) of the single rope 48 are each buried into the closed loop 46 a distance of at least 40% of a total circumference of the closed loop 46, more particularly between 40% and at least 50% of the total circumference, though, for reasons stated below, a distance of less than 50% may be preferred.

Using conventional methods, the closed loop 46 is formed at with a splice 54 drawn together by ends 50 and 52 being drawn through the splice 54. As with the main body 12, the splice 54 may be a locked brummel splice 54 or a straight splice with the same disadvantages as mentioned above except with two tag lines, as shown in Figure 9, instead of one. The first 50 and second 52 ends are then drawn through, or buried, in the continuous loop 46 with the first end 50 being positioned on one side of the locked splices 54 and the second end 52 being positioned on the other side of the locked splices 54. The first 50 and second 52 ends are thereby extending toward each other within the closed loop 46. However, they will typically remain spaced apart a distance of between 1.0 and 4.0 inches to create a narrow area 56 in the continuous loop 46 having a diameter that is less than a remainder of the continuous loop 46. Thus, the ends 50, 52 are each buried typically at least 40% and less than 50% of the total circumference of the continuous loop leaving the narrow area 56 to include less than 100% and greater than 80% of the total circumference.

The single rope 48 of the closed loop 46 has a length between 40.0 inches and 60.0 inches and the closed loop 46 will typically have a total circumference of between 20.0 inches and 30.0 inches. The single rope 48 may further comprise a 3/16 inch braided rope, though other rope diameters are contemplated with the width being typically less than 0.50 inches and generally at least 0.125 inches. As with the main body

12, the friction hitch 42 is comprised of UHMWPE. By burying the first 50 and second 52 ends of the single rope 48 through a majority of the closed loop 46, the closed loop 46 will resist damage caused by movement of the first 50 and second 52 ends within closed loop 46 while ensuring that the closed loop 46 remains intact.

In one specific example of the friction hitch 42, the single rope 48 is 47.0 inches long and is comprised of a 3/16 inch diameter of *Amsteel* rope, a type of braided rope comprised of UHMWPE. A brummel is formed 13.5" from a center point of the single rope 48 with tag ends of the single rope 48 each being buried to form a resultant closed loop 46 having a circumference from 22" to 24" depending on the stretch of the single rope 46 as it is formed into the closed loop 46. The narrow area 56 has a length being equal to between 3.0 inches and 4.0 inches. The closed loop 46 is formed into the friction hitch using what is commonly referred to as a Prusik knot.

In use, the eye loop 22 of the main body 12 is engaged on the first bridge loop 24 of the harness 26. The friction hitch 42 is formed in a conventional manner on the main body 12 and second bridge loop 44. The friction hitch 42 is positioned between the eye loop 22 and knot 36. The friction hitch 42 is conventional and can be selectively loosened and moved along the main body 12. However, the materials and structure of the main body 12 and friction hitch 42 will prevent failure and allow UHMWPE materials to be used in such a manner that they will pass standardized drop tests. The narrow portion 56 of the closed loop 46 will typically be engaged with the second bridge loop 44 and its narrow diameter will assist in locking it in grooves in the second bridge loop 44 should such be provided.

It should be understood that the engagement of the eye loop 22 with the first bridge loop 24, as well as the engagement of the friction hitch 42 with the second bridge loop 44, can be accomplished by a permanent engagement or a releasable engagement. For example, Figure 3 shows an example of a permanent engagement in which the eye loop 22 is positioned around the first bridge loop 24 to secure the main body 12 to the harness 26, though other types of permanent engagement are within the scope of the

disclosure and well known in the rope and harness arts. In a similar manner, the closed loop 46 of the friction hitch 42 could be permanently engaged with second bridge loop 44. In contrast to Figure 3, Figures 12 through 16 show an example of a releasable engagement in which the eye loop 22 is releasably engaged with the first bridge loop 24 via a releasable knot 58, in this case a girth hitch knot, though other releasable engagements are within the scope of the disclosure and well known in the rope and harness arts. For example, Figure 13 shows a method of forming a releasable knot 58, wherein the user inserts the second end 18 of the rope 14 through the first bridge loop 24 and through the eye loop 22. Figure 14 shows the completed releasable engagement of the eye loop 22 with the first bridge loop 24, wherein the eye loop 22 is wrapped around the first bridge loop 24 in the releasable knot 58. In a similar manner, the friction hitch 42 could be releasably engaged with the second bridge loop 44. For example, Figure 15 shows the friction hitch 42 releasably engaged with the second bridge loop 44 by a releasable knot 58, also in this case a girth hitch knot. Figure 12 shows a method of forming the releasable knot 58, wherein the user inserts a portion of the closed loop 46 through the second bridge loop 44. Figure 14 shows the next step in positioning the friction hitch 42 on the main body 12. Figure 15 shows the completed releasable engagement of the friction hitch 42 with the first bridge loop 24, wherein a portion of the closed loop 46 of the friction hitch 42 is wrapped around the second bridge loop 44 in the releasable knot 58.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of an embodiment enabled by the disclosure, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by an embodiment of the disclosure.

Therefore, the foregoing is considered as illustrative only of the principles of the disclosure. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the disclosure to the exact construction

and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the disclosure. In this patent document, the word “comprising” is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article “a” does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be only one of the elements.

Docket No. TETH143.03

(k) CLAIM OR CLAIMS

I claim:

1. A bridge rope assembly configured to couple together a tree rope to a first
5 bridge loop and a second bridge loop on a harness, the bridge rope assembly including:
a main body comprising a rope having a first end and a second end, the main body
having a splice therein to form an eye loop in the main body, the eye loop
being configured to permanently or releasably engage with the first bridge
loop to permanently or releasably secure the main body to the first bridge
10 loop, the main body comprising a first portion including the first end and a
second portion including the second end, the first portion extending
through the second portion of the main body such that the first end is
positioned within the second portion adjacent to the second end; and
a friction hitch being positioned on the main body between the second end and the
15 eye loop, the friction hitch being configured to permanently or releasably
engage with the second bridge loop to permanently or releasably secure
the friction hitch to the second bridge loop, the friction hitch comprising a
closed loop.
- 20 2. The bridge rope assembly according to claim 1, wherein the rope has a
length from the first end to the second end between 72.0 inches and 126.0 inches.
3. The bridge rope assembly according to claim 1, wherein a distance of the
eye loop to the second end is between 24.0 inches and 40.0 inches.
25
4. The bridge rope assembly according to claim 3, wherein the main body
includes a stop knot in the second portion adjacent to the second end.
5. The bridge rope assembly according to claim 4, further including a
30 securing member being positioned on the main body at a juncture of the first and second
ends to retain the first and second ends at a static position relative to each other.

6. The bridge rope assembly according to claim 4, wherein the closed loop comprises a single rope being formed into the closed loop

5 7. The bridge rope assembly according to claim 6, wherein the single rope of the closed loop has a length between 40.0 inches and 60.0 inches.

8. The bridge rope assembly according to claim 7, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

10

9. The bridge rope assembly according to claim 1, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

10. The bridge rope assembly according to claim 9, wherein the main body and the friction hitch each are comprised of UHMWPE.

15

11. The bridge rope assembly according to claim 1, wherein the main body is comprised of UHMWPE.

12. The bridge rope assembly according to claim 9, wherein a distance of the eye loop to the second end is between 24.0 inches and 40.0 inches.

20

13. The bridge rope assembly according to claim 12, wherein the closed loop has a total circumference of between 20.0 inches and 30.0 inches.

25

14. The bridge rope assembly according to claim 12, wherein a distance between the first and second ends is less than 2.0 inches.

15. A method of installing the bridge rope assembly on a harness according to claim 1, comprising the steps of:

30

releasably engaging the eye loop with the first bridge loop of the harness; and

releasably engaging the friction hitch with the second bridge loop of the harness.

16. The method of claim 15, wherein the step of releasably engaging the eye loop with the first bridge loop comprises inserting the second end of the rope through the first bridge loop and through the eye loop and forming a releasable knot with the eye loop wrapped around the first bridge loop.

17. The method of claim 15, wherein the step of releasably engaging the friction hitch with the second bridge loop comprises inserting a portion of the closed loop through the second bridge loop and forming a releasable knot with the portion of the closed loop wrapped around the second bridge loop.

15

Client's Docket No. TETH143.03

(1) ABSTRACT OF THE DISCLOSURE

5 A bridge rope assembly includes a main body comprising a rope that has a first end and a second end. The rope has a splice therein to form an eye loop in the main body. The eye loop is configured to engage a first bridge loop of a harness. The main body comprises a first portion including the first end and a second portion including the second end. The first portion extends through the second portion of the main body such that the first end is positioned adjacent to the second end. A distance between the first and second ends is less than 2.0 inches.



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/671,581

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ATTORNEY DOCKET #
TETH143.03

Title of Invention

Bridge Rope Assembly

Application Information

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

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FILED BY Sara Egge

PATENT CENTER # 65635168

FILING DATE -

CUSTOMER # 44088

FIRST NAMED
INVENTOR Walter Ernest Power II

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Brendan Dix

Documents

TOTAL DOCUMENTS: 8

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
TETH14303ADS.pdf	9	Application Data Sheet	1227 KB
TETH143.03aia0424.pdf	2	Track One Request	146 KB
TETH14303EFS- APP.TEXT.docx	15	Application body structured text document	40 KB
Warning: At least one claim appears to not end with a period. Please review and revise if necessary. At least one claim appears to contain more than one sentence. Please review and revise if necessary.			
WO2018111624A1__Original_ document__20240521221256. pdf	31	Foreign Reference	2324 KB

TETH14303IDS.pdf		5	Information Disclosure Statement (IDS) Form (SB08)	1011 KB
TETH143.03num.pdf		14	Drawings-only black and white line drawings	273 KB
TETH14303oath.pdf		6	-	2708 KB
TETH14303oath-OATH.pdf	(1-4)	4	Oath or Declaration filed	1308 KB
TETH14303oath-PA...pdf	(5-6)	2	Power of Attorney	1397 KB

Digest

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New Applications Under 35 U.S.C. 111

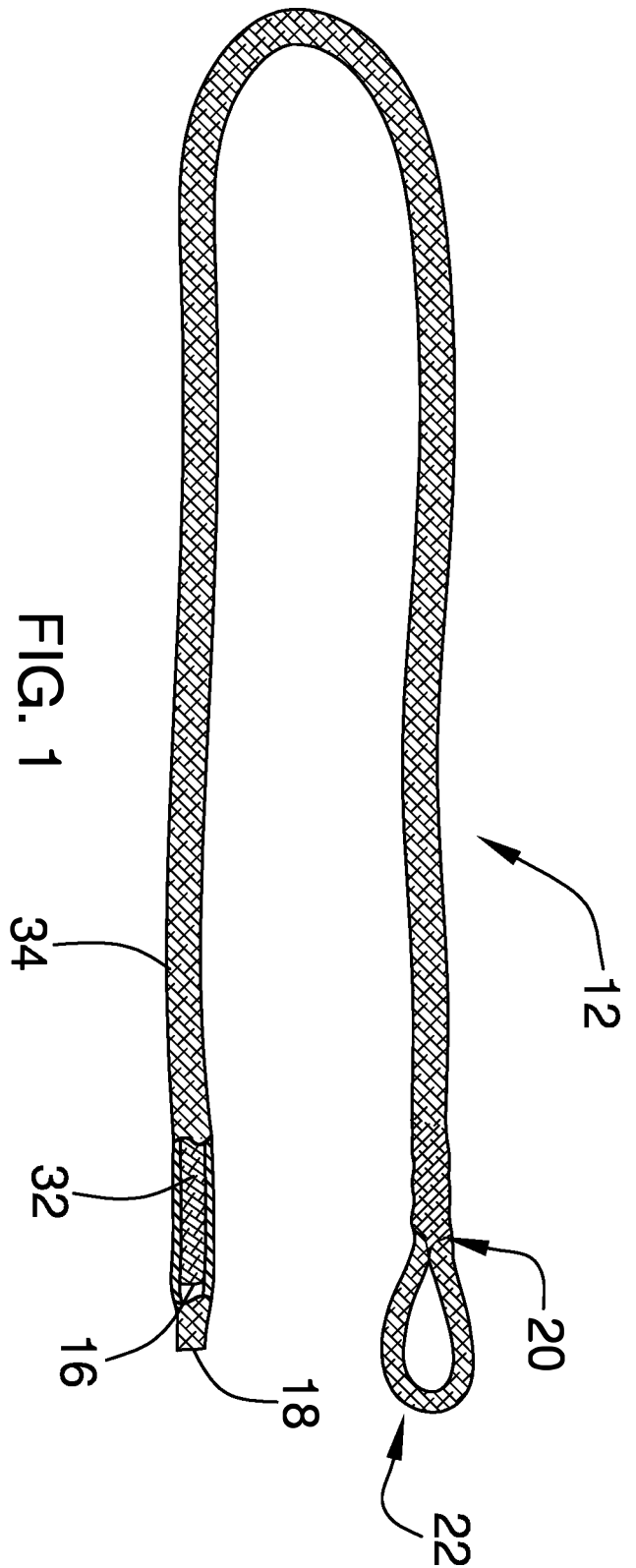
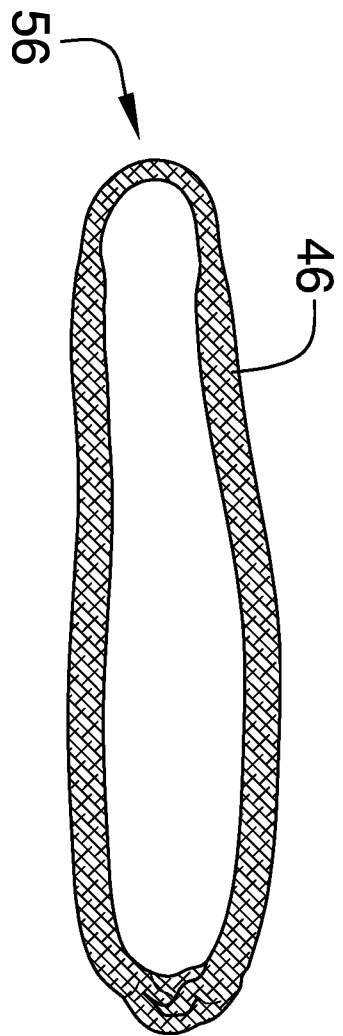
If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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.



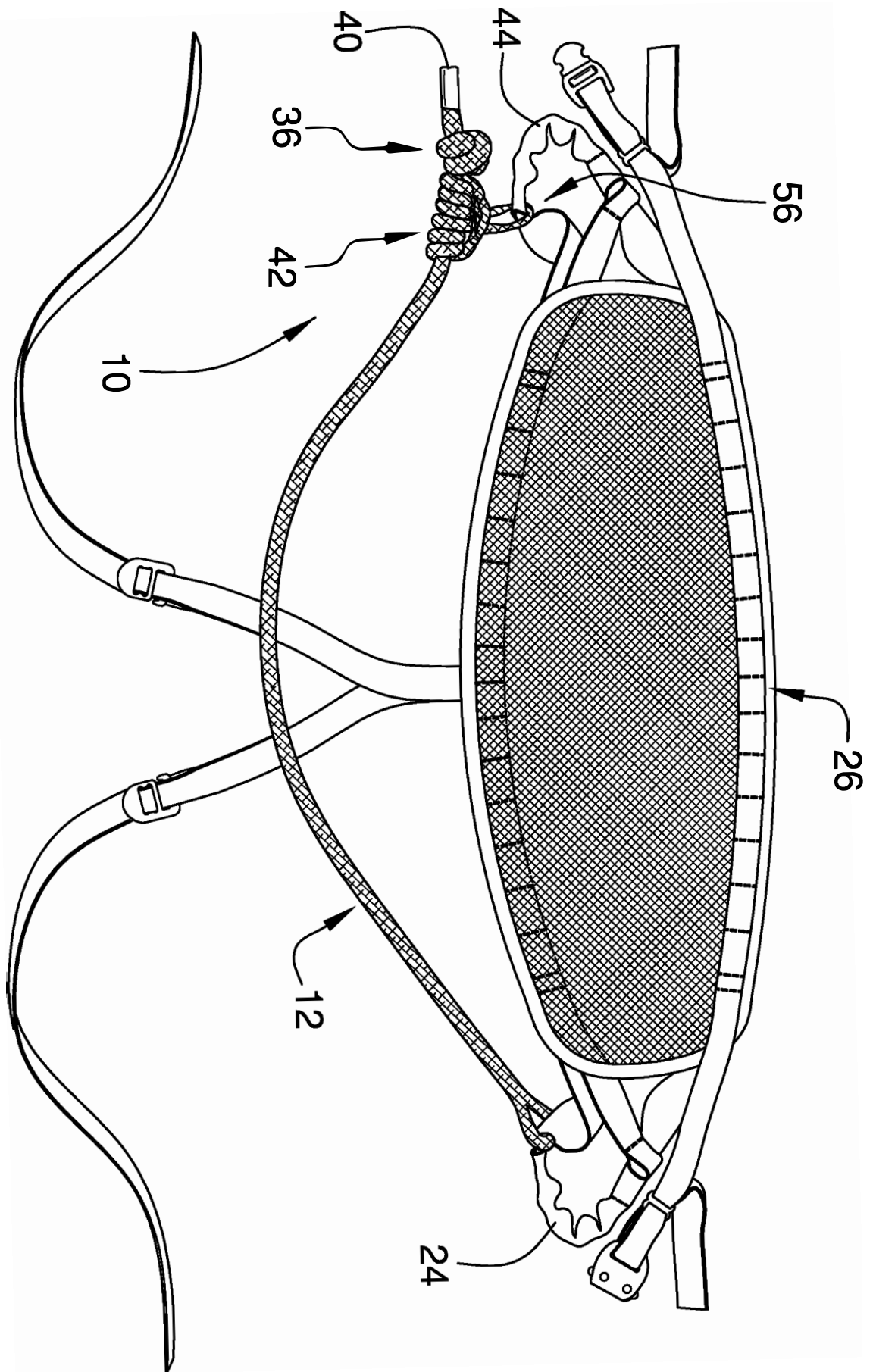


FIG. 3

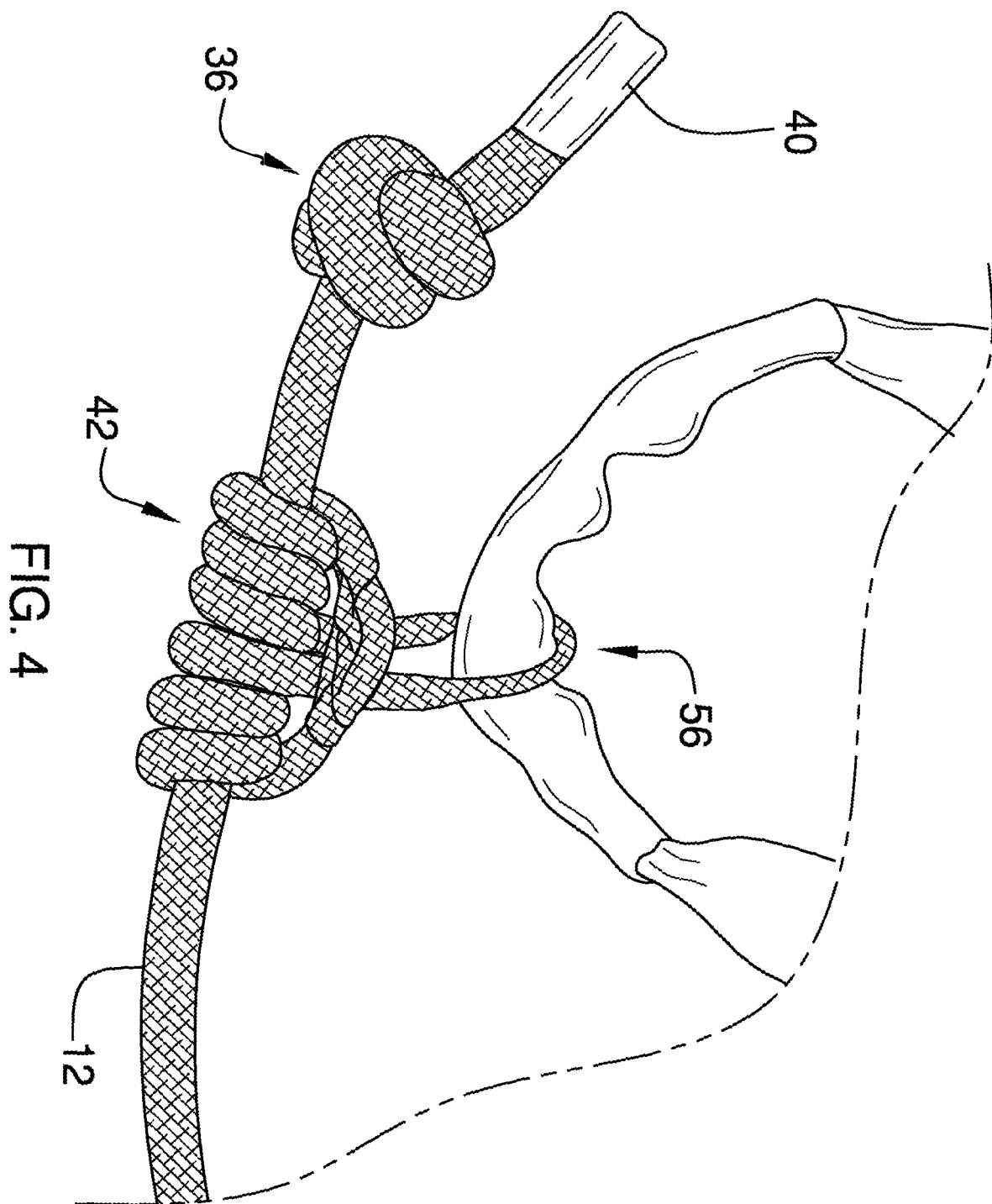


FIG. 4

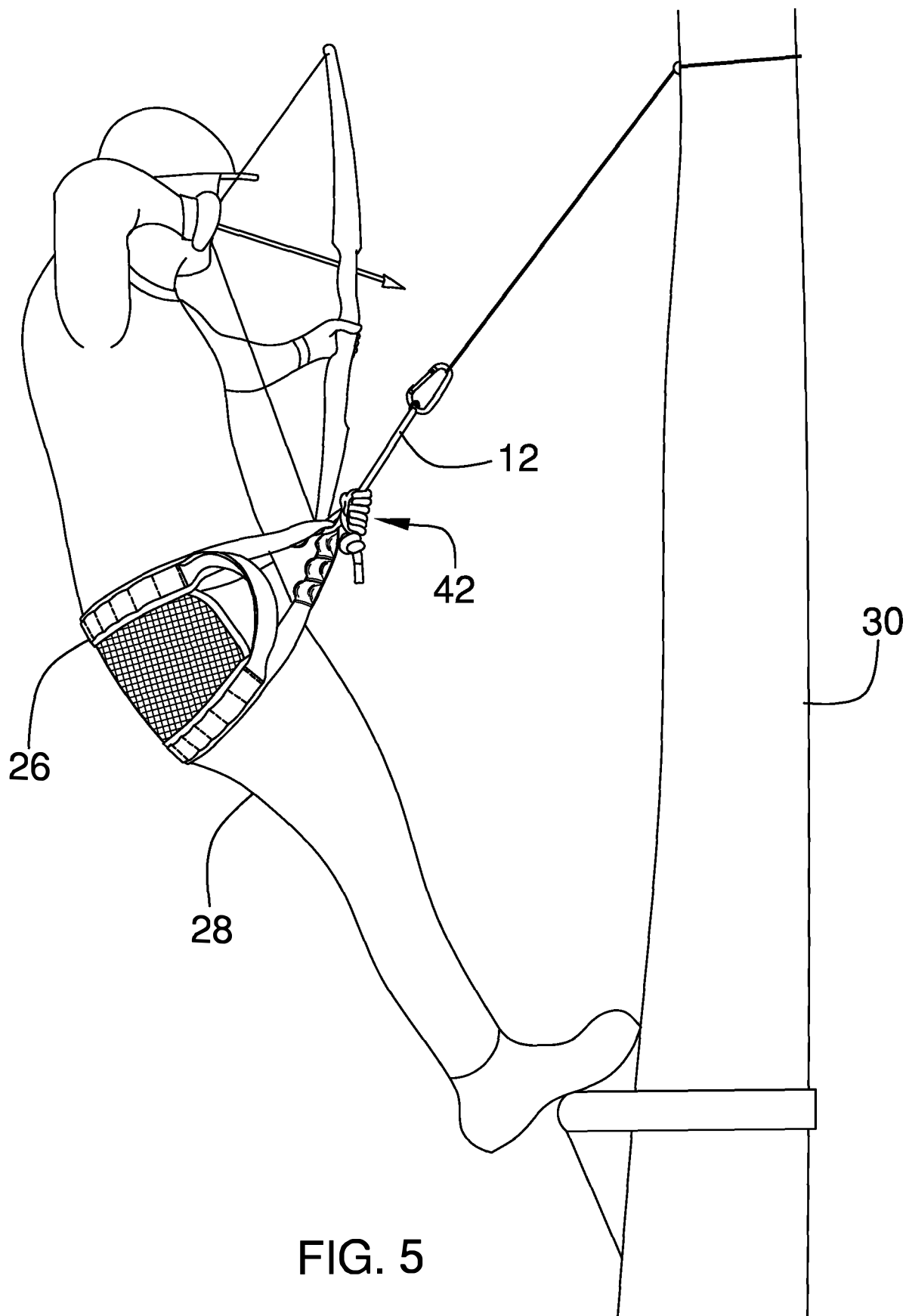


FIG. 5

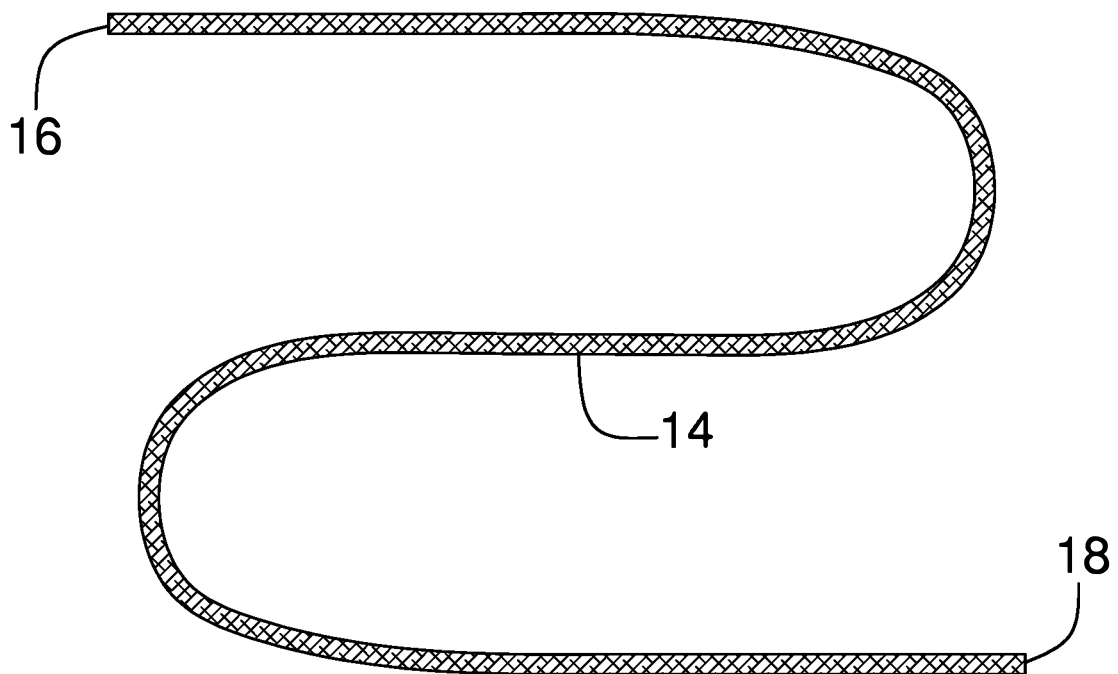


FIG. 6

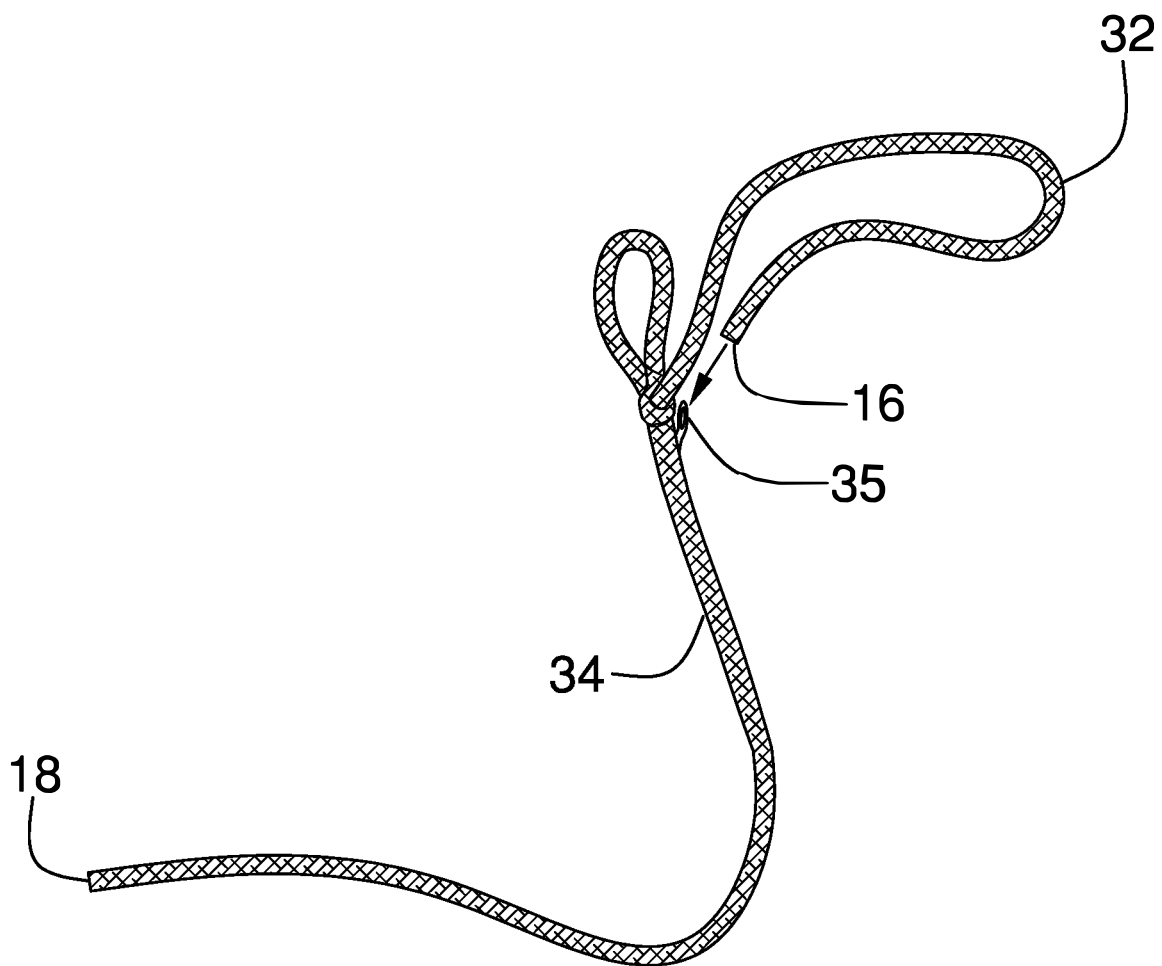


FIG. 7

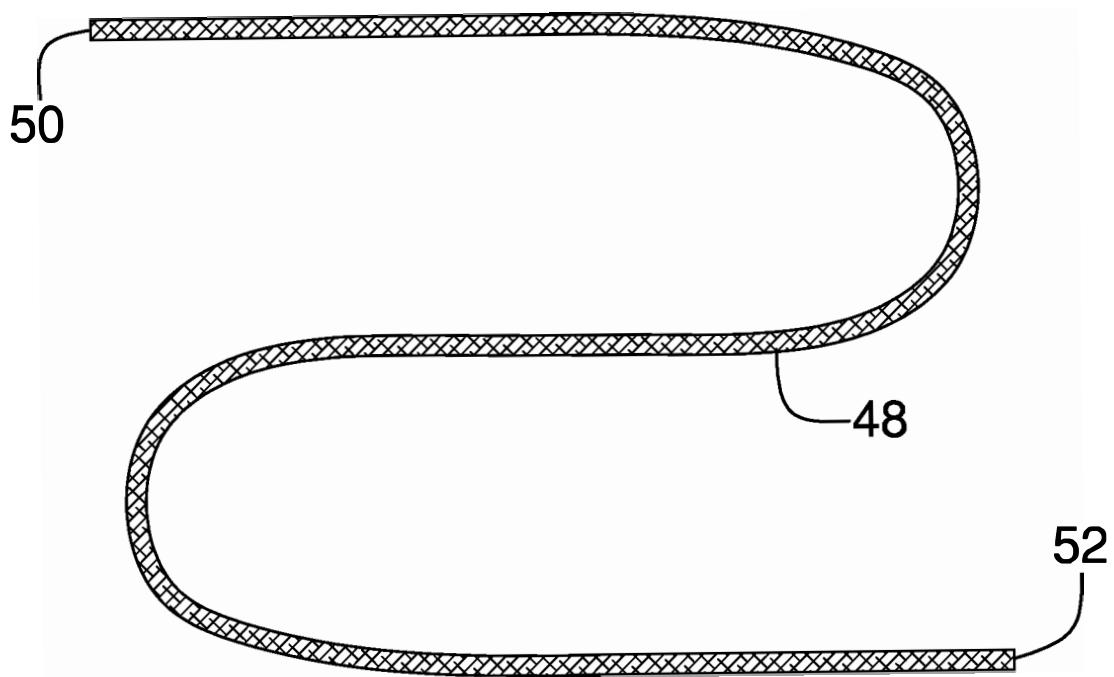


FIG. 8

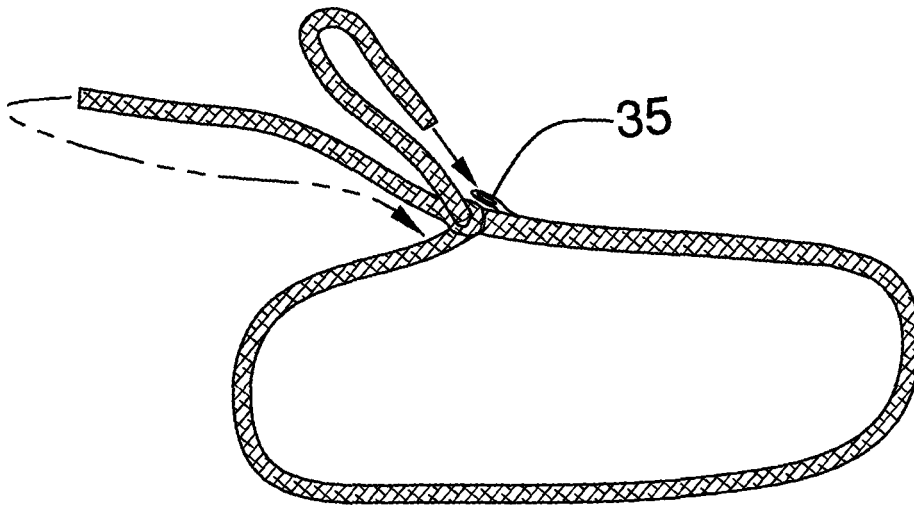


FIG. 9

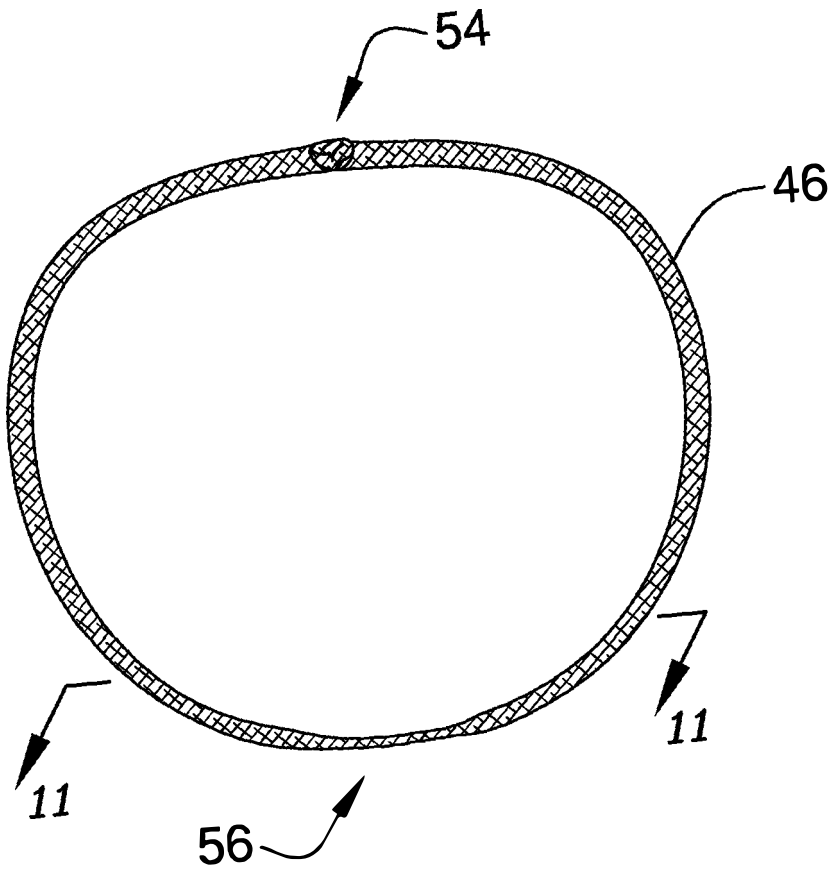


FIG. 10

FIG. 11

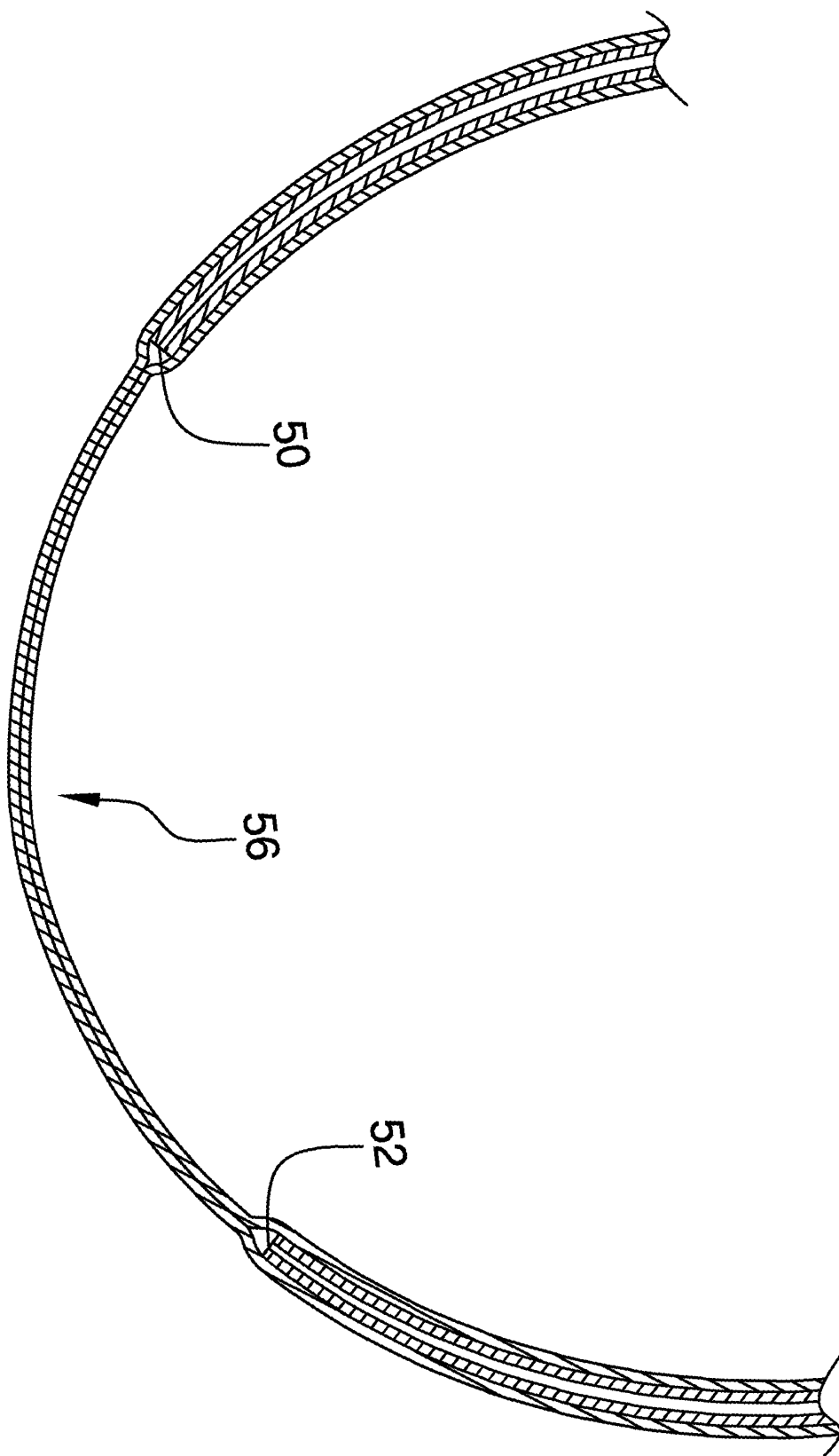
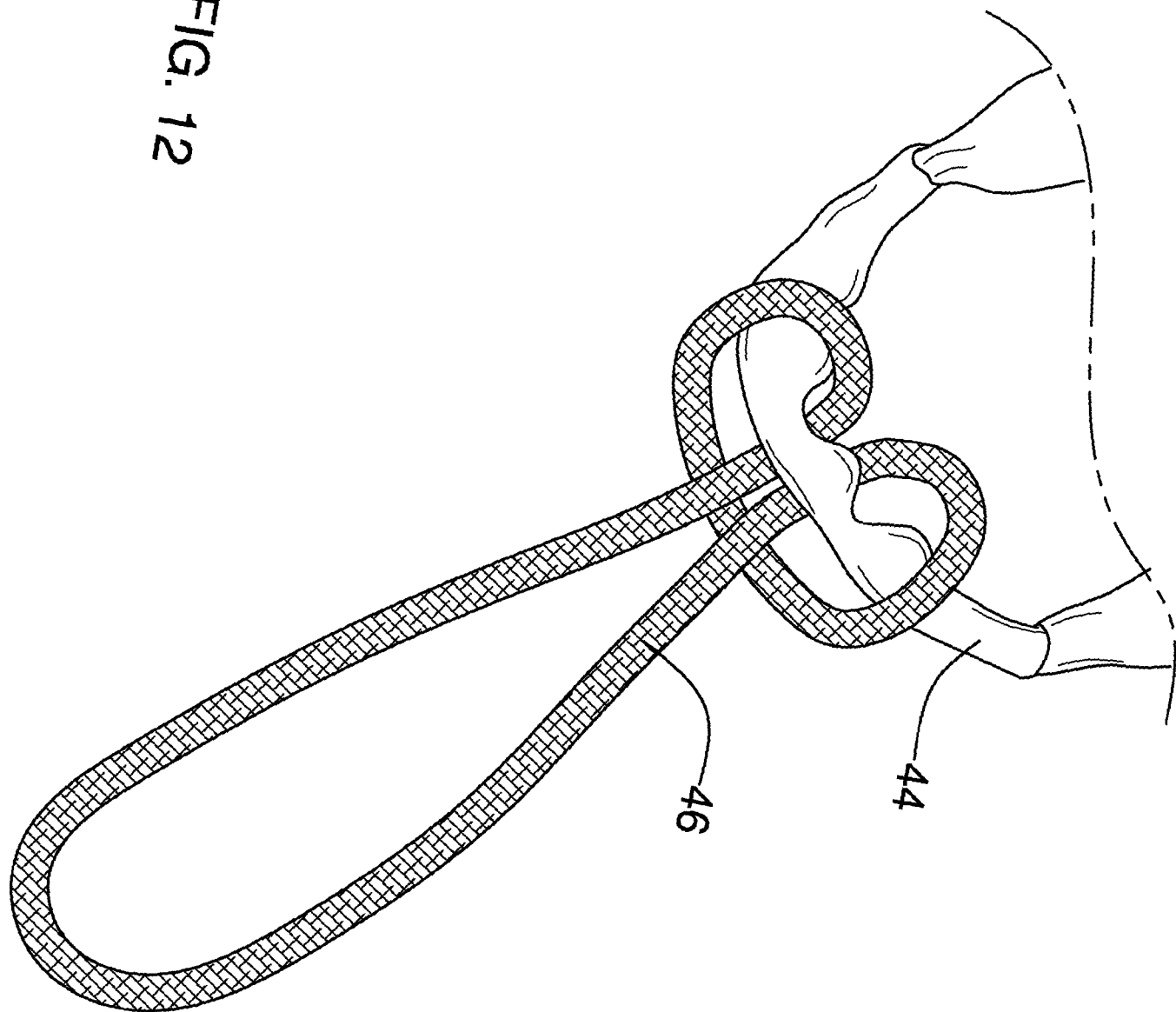


FIG. 12



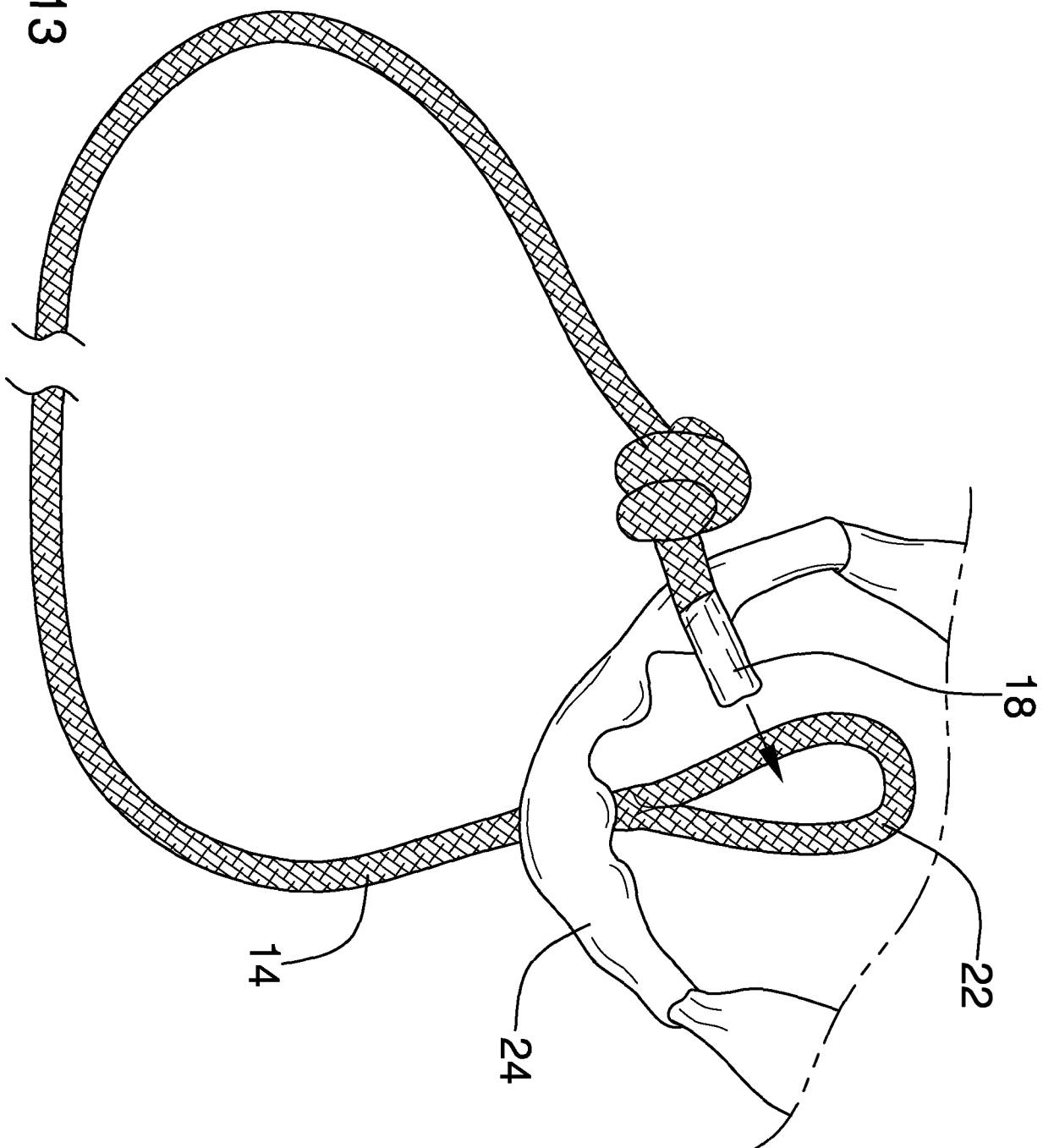


FIG. 13

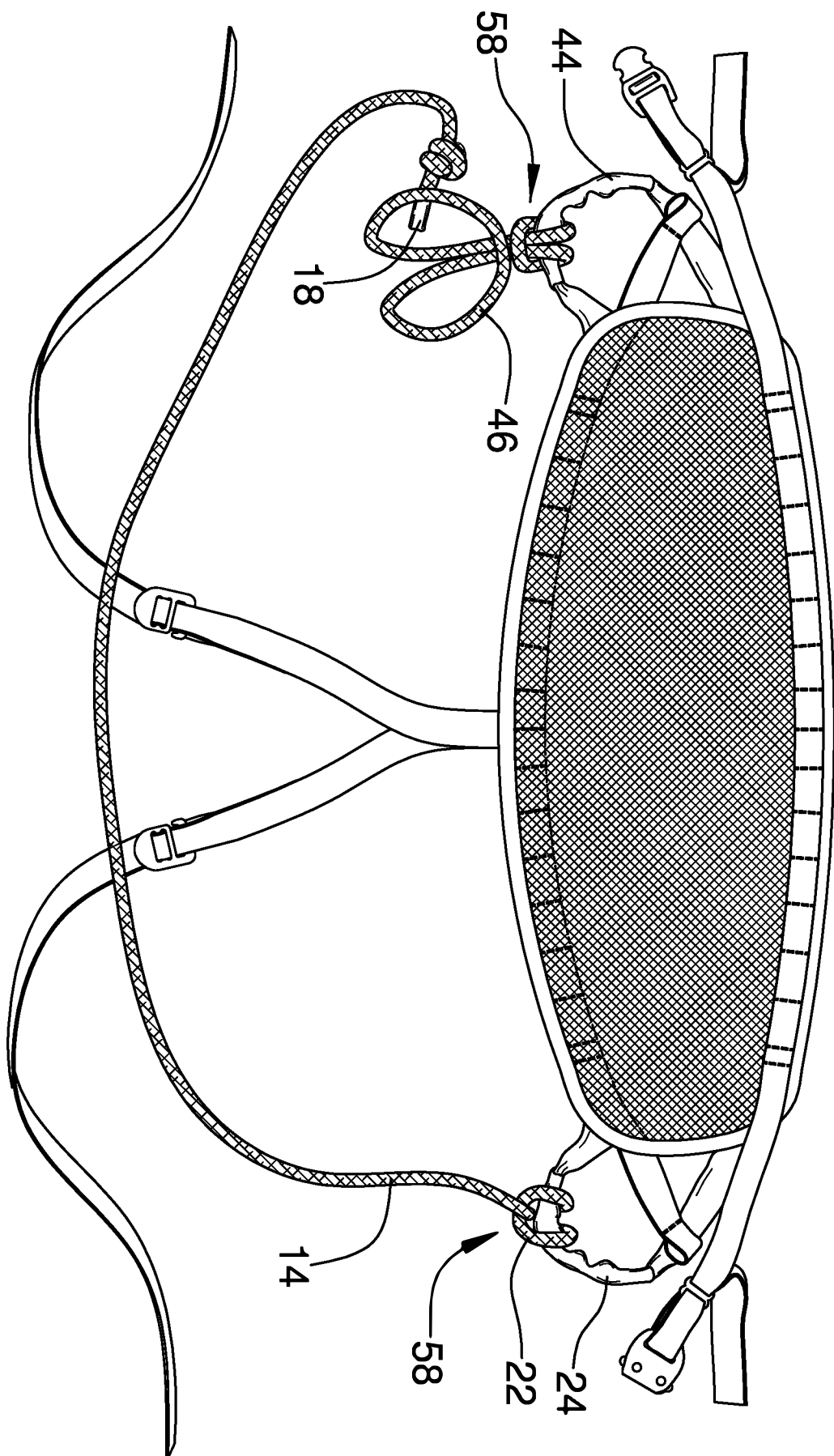
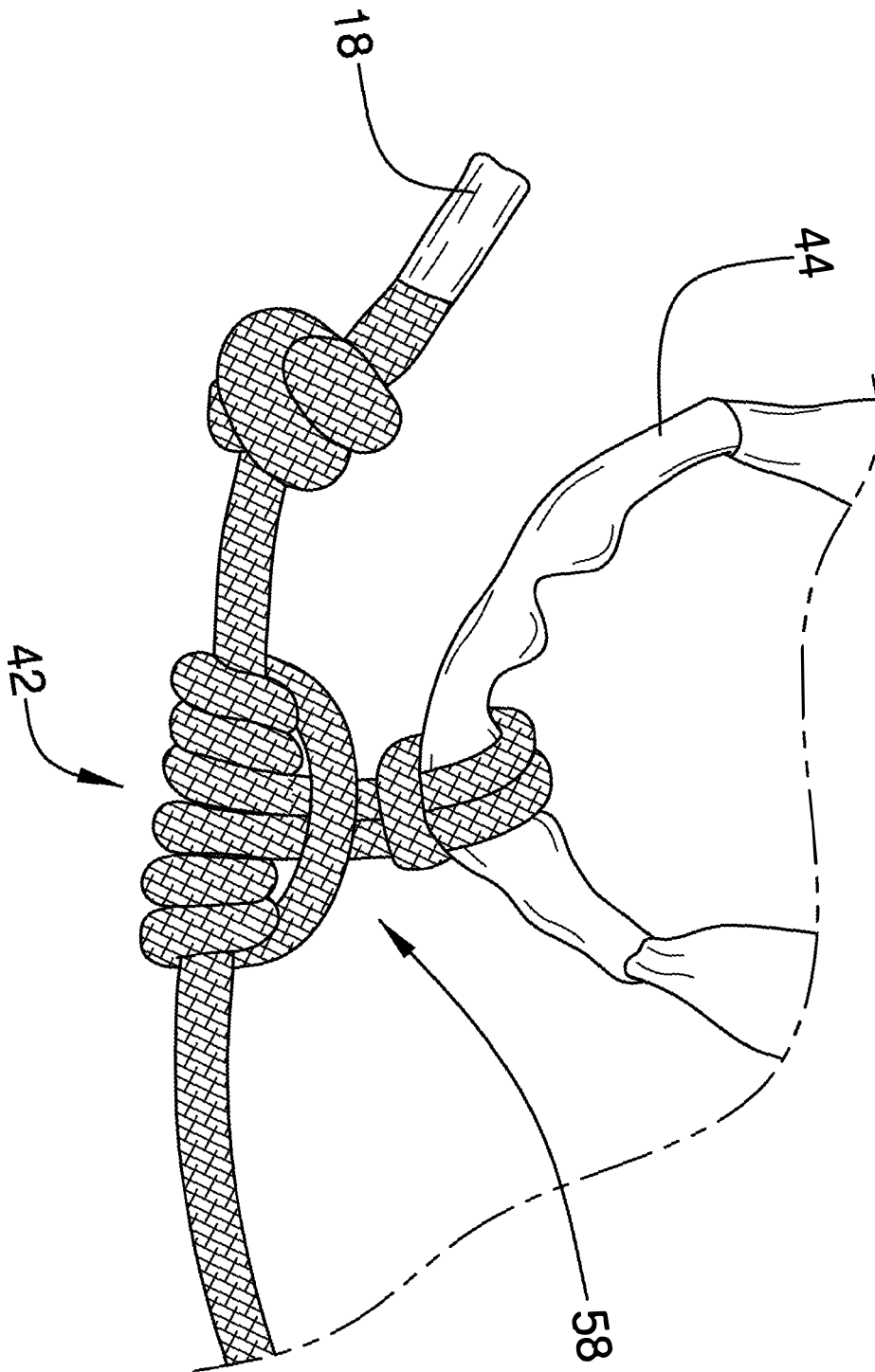


FIG. 14

FIG. 15



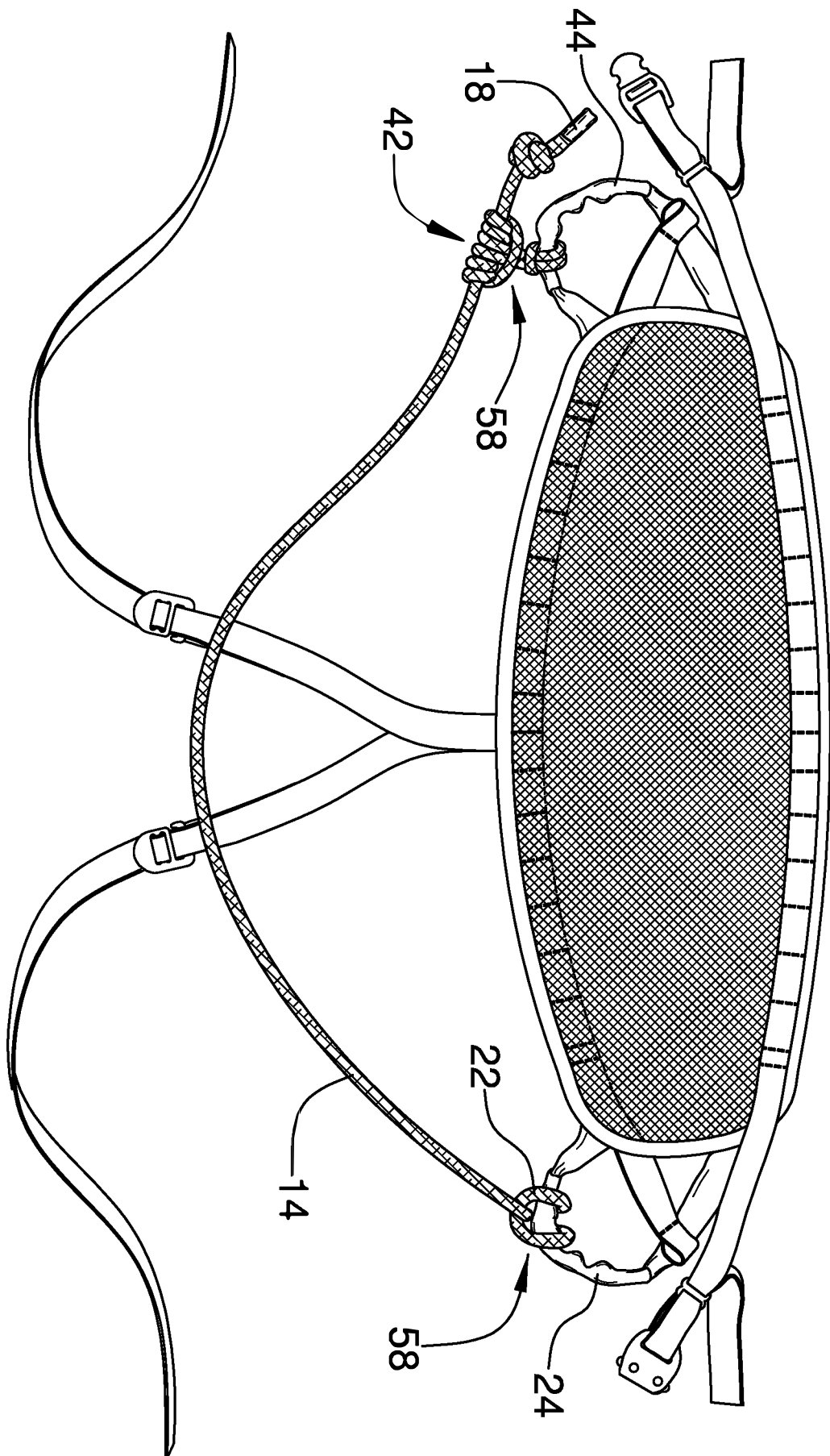


FIG. 16

Placeholder Sheet for Supplemental Content

Application Number: 18671581

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