PTO/SB/80 (11-08)
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 19694

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 19694

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Brainguard Technologies, Inc.
1395 Rifle Range Road
El Cerrito, CA 94530

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

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

Signature	Robert T. Knight	Date	11-3-11
Name	Robert T. Knight	Telephone	510-237-5285
Title	Founder BrainGuard Technologies		

This collection of information is required by 37 CFR 1.31, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

REVELYST 1003

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Robert T. Knight

Application No./Patent No.: Not Yet Assigned Filed/Issue Date: Herewith

Titled: BIOMECHANICS AWARE PROTECTIVE GEAR

Brainguard Technologies, Inc., a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 029836, Frame 0912, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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 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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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

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5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Audrey Kwan/	2015-05-15
Signature	Date
Avery Audrey Kwan	46850
Printed or Typed Name	Title or Registration Number

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP001C2
Application No.: Not Yet Assigned	Examiner: Not Yet Assigned
Filed: Herewith	Group: Not Yet Assigned
Title: BIOMECHANICS AWARE PROTECTIVE GEAR	Confirmation No.: Not Yet Assigned

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on May 15, 2015.
Signed: /Amber Lundy/
Amber Lundy

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

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

Dear Sir:

The references listed in the attached PTO Form 1449 may be material to examination of the above-identified patent application. The Examiner is requested to make the identified references of official record in this application. The above-identified application is a continuation of prior application U.S. Patent Application No. 14/485,993, which is a continuation of prior application U.S. Patent Application No. 13/554,471. Because some of the listed references were either cited by the USPTO, or submitted to the USPTO in the prior applications, under 37 CFR § 1.98(d), Applicants submit that copies of these references need not be provided. Copies of non-U.S. references that were not cited in the priority applications are attached.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that the reference(s) indeed constitutes prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-6367. (Order No. BRGDP001C2).

Respectfully submitted,
Kwan & Olynick LLP

/ Audrey Kwan /

Avery Audrey Kwan
Registration No. 46,850

2000 Hearst Avenue, Ste 305
Berkley, CA 94709
510-900-9501 x705

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		3946441		1976-03-30	Johnson, John R.	
		4352484		1982-10-05	Gertz, David C., et al.	
		5713082		1998-02-03	Bassette, Aldean B., et al.	
		5815846		1998-10-06	Calonge, Rafael	
		5956777		1999-09-28	Popovich, Darko D.	
		6103641		2000-08-15	Gehring Jr., George G.	
		6145348		2000-11-14	Hardegree, Mike et al.	
		6378140		2002-04-30	Abraham, Carl J., et al.	
		6434755		2002-08-20	Halstead, David P., et al.	
		20030088906	A1	2003- 05-15	Baker, Gregg S.	
		6658671		2003-12-09	Von Holst, Hans et al.	

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

		6728969		2004- 05-04	Zeiler, Bernard	
		20040126565	A1	2004-07-01	Naganathan, Ganapathy et al.	
		6996856		2006-02-14	Puchalski, Ione G.	
		20060059605	A1	2006-03-23	Ferrara, Vincent R.	
		7076811		2006-07-18	Puchalski, Ione G.	
		7254843		2007-08-14	Talluri, Srikrishna	
		20080066217	A1	2008-03-20	Depreitere, Bart et al.	
		20110004980	A1	2011-01-13	Leatt, Christopher J., et al.	
		8176574		2012- 05-15	Bryant, Mark et al.	
		20130019384	A1	2013-01-24	Knight, Robert T.	
		8533869		2013-09-17	Capuano, Sonya A.	
		8863319		2014-10-21	Knight, Robert T.	
		20150000014	A1	2015-01-01	Knight, Robert T.	

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

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]
		0145526	WO	A1	2001-06-28	Von Holst, Hans et al.		
		2004032659	WO	A1	2004-04-22	Madey, Steven M., et al.		
		1050905	SE	A1	2011-07-14	Halldin, Peter et al.		
		2011087435	WO	A1	2011-07-21	Halldin, Peter et al.		
		2012109381	WO	A1	2012-08-16	Weber, Robert et al.		
		2013013180	WO	A1	2013-01-24	Knight, Robert		
		2734071	EP		2014- 05-28	Knight, Robert T.		

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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	**Application Number**	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

		"Application Serial No. 13/554,471, Non Final Office Action mailed 05-22-14", 5 pgs.	
		"Application Serial No. 13/554,471, Notice of Allowance mailed 07-15-14", 5 pgs.	
		"Application Serial No. 14/485,993, Non Final Office Action mailed 10-28-14", 6 pgs.	
		"Application Serial No. 14/485,993, Notice of Allowance mailed 03-19-15", 5 pgs.	
		"European Application Serial No. 12814787.3, Search Report and Opinion mailed 03-30-15", 6 pgs.	
		"Helmet with Fluid Layer that Protects Against a Common Cause of Head Injury", Office of Technology Licensing, University of Florida, [Online]. Retrieved from the Internet: < http://apps.research.ufl.edu/otl/pdf/marketing/13586.pdf > Accessed on 7/12/12, 2 pgs.	
		"International Application Serial No. PCT/US2012/047662, Search Report and Written Opinion mailed 10-05-12", 8 pgs.	
		"Int'l Application Serial No. PCT/US2012/047662, Preliminary Report on Patentability mailed 01-30-14", 7 pgs.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

		"Lazer Helmets", [Online]. Retrieved from the Internet: < http://www.lazerhelmets.com/wp-content/uploads/2011/04/Catalogue-Motorcycling-2010-UK.pdf >, Accessed on 7/12/12, 54 pgs.	
		"Proposal for a Novel Helmet Design", Brainguard Technologies, 14 pgs.	
		BOSCH, HENRICUS V. , "Crash Helmet Testing and Design Specifications", University Press Facilities, Eindhoven, The Netherlands, 2006, 179 pgs.	
		COLLINS, MICKY , "Examining Concussion Rates and Return to Play in High School Football Players Wearing Newer Helmet Technology: A Three-Year Prospective Cohort Study", Neurosurgery, Vol. 58, No. 2, February 2006, 12 pgs.	
		GOEL, R , "Design of an Advanced Helmet Liner User Simulations", [Online]. Retrieved from the Internet: < http://mvl.mit.edu/MVLpubs/MVL_10.07_Goel.pdf > Accessed on 3/13/12, 8 pgs.	
		MAY, PHILIP R. , "Woodpecker Drilling Behavior: An Endorsement of the Rotational Theory of Impact Brain Injury", Arch Neural, Vol. 36, June 1979, pgs. 370-373	
		VIANO, DAVID C. , "Concussion in Professional Football: Brain Responses by Finite Element Analysis: Part 9", Neurosurgery, Vol. 57, No. 5, November 2005, pgs. 891-916	
		WANG, LIZHEN , "Why do Woodpeckers Resist Head Impact Injury: A Biomechanical Investigation", PLos One, Vol. 6, No. 10, October 2011, 8 pgs.	

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*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.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Avery Audrey Kwan/Amber Lundy
Attorney Docket Number:	BRGDP001C2

Filed as Small Entity

Filing Fees for **Utility under 35 USC 111(a)**

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**730**

Electronic Acknowledgement Receipt

EFS ID:	22354801
Application Number:	14714093
International Application Number:	
Confirmation Number:	2486
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Avery Audrey Kwan/Amber Lundy
Filer Authorized By:	Avery Audrey Kwan
Attorney Docket Number:	BRGDP001C2
Receipt Date:	15-MAY-2015
Filing Date:	
Time Stamp:	19:39:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$730
RAM confirmation Number	5594
Deposit Account	506367
Authorized User	KWAN, AVERY AUDREY

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

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP001C2_Application_filed_05-15-15.pdf	2424094 c8c2e7dbea046e75054301a848d63d7998a16609	yes	47

Multipart Description/PDF files in .zip description

Document Description	Start	End
Application Data Sheet	1	6
Specification	7	25
Claims	26	28
Abstract	29	29
Drawings-only black and white line drawings	30	35
Oath or Declaration filed	36	36
Power of Attorney	37	37
Assignee showing of ownership per 37 CFR 3.73	38	39
Transmittal Letter	40	41
Information Disclosure Statement (IDS) Form (SB08)	42	47

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	35282 ca1fb81e341b8e369de2cfed920e034b7e155c15	no	2

Warnings:

Information:

Total Files Size (in bytes):	2459376

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP001C2
	Application Number	
Title of Invention	BIOMECHANICS AWARE PROTECTIVE GEAR	

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

Secrecy Order 37 CFR 5.2

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

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert	T.	Knight	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Berkeley	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	1395 Rifle Range Road		
Address 2			
City	El Cerrito	**State/Province**	CA
Postal Code	94530	**Country i**	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	19694		
Email Address	docket@kwanip.com	Add Email	Remove Email

Application Information:

Title of the Invention	BIOMECHANICS AWARE PROTECTIVE GEAR		
Attorney Docket Number	BRGDP001C2	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	**Suggested Figure for Publication (if any)**	

Filing By Reference :

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	BRGDP001C2
	Application Number	
Title of Invention	BIOMECHANICS AWARE PROTECTIVE GEAR	

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

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☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

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

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Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Herewith	Continuation of	14485993	2014-09-15

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14485993	Continuation of	13554471	2012-07-20	8863319	2014-10-21

Prior Application Status	Expired		Remove

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP001C2
	Application Number	
Title of Invention	BIOMECHANICS AWARE PROTECTIVE GEAR	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
13554471	Claims benefit of provisional	61510401	2011-07-21

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Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP001C2
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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.

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- (●) 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. ☒

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP001C2
	Application Number	
Title of Invention	BIOMECHANICS AWARE PROTECTIVE GEAR	

Email Address	

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Assignee Information including Non-Applicant Assignee Information:

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

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

Signature:

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Signature	/Audrey Kwan/			Date (YYYY-MM-DD)	2015-05-15
First Name	Avery Audrey	Last Name	Kwan	Registration Number	46850

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP001C2
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Title of Invention	BIOMECHANICS AWARE PROTECTIVE GEAR	

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.**

Attorney Docket No: BRGDP001C2

BIOMECHANICS AWARE PROTECTIVE GEAR

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BIOMECHANICS AWARE PROTECTIVE GEAR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit under 35 U.S.C. § 120 to U.S. Application No. 14/485,993, entitled BIOMECHANICS AWARE HELMET, filed September 15, 2014 (Attorney Docket No. BRGDP001C1), which claims benefit under 35 U.S.C. § 120 to U.S. Application No.13/554,471, entitled BIOMECHANICS AWARE PROTECTIVE GEAR, filed July 20, 2012, now issued as U.S. Patent No. 8,863,319 on October 21, 2014 (Attorney Docket No. BRGDP001), which claims priority to U.S. Provisional Patent Application No. 61/510,401, entitled SMART BIOMECHANICS AWARE ENERGY CONSCIOUS PROTECTIVE GEAR WITH TISSUE PROTECTION, filed on July 21, 2011 (Attorney Docket No. BRGDP001P), all of which are incorporated herein by reference for all purposes.

TECHNICAL FIELD

[0002] The present disclosure relates to biomechanics aware protective gear.

DESCRIPTION OF RELATED ART

[0003] Protective gear such as sports and safety helmets are designed to reduce direct impact forces that can mechanically damage an area of contact. Protective gear will typically include padding and a protective shell to reduce the risk of physical head injury. Liners are provided beneath a hardened exterior shell to reduce violent deceleration of the head in a smooth uniform manner and in an extremely short distance, as liner thickness is typically limited based on helmet size considerations.

[0004] Protective gear is reasonably effective in preventing injury. Nonetheless, the effectiveness of protective gear remains limited. Consequently, various mechanisms are provided to improve protective gear in a biomechanically aware manner.

Brief Description of the Drawings

[0005] The disclosure may best be understood by reference to the following description taken in conjunction with the accompanying drawings, which illustrate particular embodiments.

[0006] Figure 1 illustrates types of forces on axonal fibers.

[0007] Figure 2 illustrates one example of a piece of protective gear.

[0008] Figure 3 illustrates one example of a container device system.

[0009] Figure 4 illustrates another example of a container device system.

[0010] Figure 5 illustrates one example of a multiple shell system.

[0011] Figure 6 illustrates one example of a multiple shell helmet.

DESCRIPTION OF EXAMPLE EMBODIMENTS

[0012] Reference will now be made in detail to some specific examples of the invention including the best modes contemplated by the inventors for carrying out the invention. Examples of these specific embodiments are illustrated in the accompanying drawings. While the invention is described in conjunction with these specific embodiments, it will be understood that it is not intended to limit the invention to the described embodiments. On the contrary, it is intended to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

[0013] For example, the techniques of the present invention will be described in the context of helmets. However, it should be noted that the techniques of the present invention apply to a wide variety of different pieces of protective gear. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. Particular example embodiments of the present invention may be implemented without some or all of these specific details. In other instances, well known process operations have not been described in detail in order not to unnecessarily obscure the present invention.

[0014] Various techniques and mechanisms of the present invention will sometimes be described in singular form for clarity. However, it should be noted that some embodiments include multiple iterations of a technique or multiple instantiations of a mechanism unless noted otherwise. For example, a protective device may use a single strap in a variety of contexts. However, it will be appreciated that a system can use multiple straps while remaining within the scope of the present invention unless otherwise noted. Furthermore, the techniques and mechanisms of the present invention will sometimes describe a connection between two entities. It should be noted that a connection between two entities does not necessarily mean a direct, unimpeded connection, as a variety of other entities may reside between the two entities. For example, different layers may be connected using a variety of materials. Consequently, a connection does not necessarily mean a direct, unimpeded connection unless otherwise noted.

[0015] Overview

[0016] Protective gear includes an outer shell layer connected to a middle shell layer through an outer energy and impact transformer layer. The middle shell layer is connected to an inner shell layer through an inner energy and impact transformer layer. The outer and inner energy and impact transformer layers flexibly connect the shell layers to absorb impact forces, rotational forces, shear forces, etc., and allow the various shell layers to move and slide relative to the other shell layers. The outer and inner energy and impact transformer layers may be constructed using gels, fluids, electro-rheological elements, magneto-rheological elements, etc. The protective gear may be formed as helmets or body protection for various activities and may be used to protect users from not only impact and penetrative forces, but rotational and shear forces as well.

[0017] Example Embodiments

[0018] Protective gear such as knee pads, shoulder pads, and helmets are typically designed to prevent direct impact injuries or trauma. For example, many pieces of protective gear reduce full impact forces that can structurally damage an area of contact such as the skull or knee. Major emphasis is placed on reducing the likelihood of cracking or breaking of bone. However, the larger issue is preventing the tissue and neurological damage caused by rotational forces, shear forces, oscillations, and tension/compression forces.

[0019] For head injuries, the major issue is neurological damage caused by oscillations of the brain in the cranial vault resulting in coup-contracoup injuries manifested as direct contusions to the central nervous system (CNS), shear injuries exacerbated by rotational, tension, compression, and /or shear forces resulting in demyelination and tearing of axonal fibers; and subdural or epidural hematomas. Because of the emphasis in reducing the likelihood of cracking or breaking bone, many pieces of protective gear do not sufficiently dampen, transform, dissipate, and/or distribute the rotational, tension, compression, and/or shear forces, but rather focus on absorbing the direct impact forces over a small area, potentially exacerbating the secondary forces on the CNS. Initial mechanical damage results in a secondary

cascade of tissue and cellular damage due to increased glutamate release or other trauma induced molecular cascades.

[0020] Traumatic brain injury (TBI) has immense personal, societal and economic impact. The Center for Disease Control and Prevention documented 1.4 million cases of TBI in the USA in 2007. This number was based on patients with a loss of consciousness from a TBI resulting in an Emergency Room visit. With increasing public awareness of TBI this number increased to 1.7 million cases in 2010. Of these cases there were 52,000 deaths and 275,000 hospitalizations, with the remaining 1.35 million cases released from the ER. Of these 1.35 million discharged cases at least 150,000 people will have significant residual cognitive and behavioral problems at 1-year post discharge from the ER. Notably, the CDC believes these numbers under represent the problem since many patients do not seek medical evaluation for brief loss of consciousness due to a TBI. These USA numbers are similar to those observed in other developed countries and are likely higher in third-world countries with poorer vehicle and head impact protection. To put the problem in a clearer perspective, the World Health Organization (WHO) anticipates that TBI will become a leading cause of death and disability in the world by the year 2020.

[0021] The CDC numbers do not include head injuries from military actions. Traumatic brain injury is widely cited as the "signature injury" of Operation Enduring Freedom and Operation Iraqi Freedom. The nature of warfare conducted in Iraq and Afghanistan is different from that of previous wars and advances in protective gear including helmets as well as improved medical response times allow soldiers to survive events such as head wounds and blast exposures that previously would have proven fatal. The introduction of the Kevlar helmet has drastically reduced field deaths from bullet and shrapnel wounds to the head. However, this increase in survival is paralleled by a dramatic increase in residual brain injury from compression and rotational forces to the brain in TBI survivors. Similar to that observed in the civilian population the residual effects of military deployment related TBI are neurobehavioral symptoms such as cognitive deficits and emotional and somatic complaints. The statistics provided by the military cite an incidence of 6.2% of head injuries in combat zone veterans. One might expect these numbers to hold in other countries.

[0022] In addition to the incidence of TBI in civilians from falls and vehicular accidents or military personnel in combat there is increasing awareness that sports-related repetitive forces applied to the head with or without true loss of consciousness can have dire long-term consequences. It has been known since the 1920's that boxing is associated with devastating long-term issues including "dementia pugilistica" and Parkinson-like symptoms (i.e. Mohammed Ali). We now know that this repetitive force on the brain dysfunction extends to many other sports. Football leads the way in concussions with loss of consciousness and post-traumatic memory loss (63% of all concussions in all sports), wrestling comes in second at 10% and soccer has risen to 6% of all sports related TBIs. In the USA 63,000 high school students suffer a TBI per year and many of these students have persistent long-term cognitive and behavioral issues. This disturbing pattern extends to professional sports where impact forces to the body and head are even higher due to the progressive increase in weight and speed of professional athletes. Football has dominated the national discourse in the area but serious and progressive long-term neurological issues are also seen in hockey and soccer players and in any sport with the likelihood of a TBI. Repetitive head injuries result in progressive neurological deterioration with neuropathological findings mimicking Alzheimer's disease. This syndrome with characteristic post-mortem neuropathological findings on increases in Tau proteins and amyloid plaques is referred to as Chronic Traumatic Encephalopathy (CTE).

[0023] The human brain is a relatively delicate organ weighing about 3 pounds and having a consistency a little denser than gelatin and close to that of the liver. From an evolutionary perspective, the brain and the protective skull were not designed to withstand significant external forces. Because of this poor impact resistance design, external forces transmitted through the skull to the brain that is composed of over 100 billion cells and up to a trillion connecting fibers results in major neurological problems. These injuries include contusions that directly destroy brain cells and tear the critical connecting fibers necessary to transmit information between brain cells.

[0024] Contusion injuries are simply bleeding into the substance of the brain due to direct contact between the brain and the bony ridges of the inside of the skull. Unfortunately, the brain cannot tolerate blood products and the presence of blood kicks off a biological cascade that further damages the brain. Contusions are due to

the brain oscillating inside the skull when an external force is applied. These oscillations can include up to three cycles back and forth in the cranial vault and are referred to as coup-contra coup injuries. The coup part of the process is the point of contact of the brain with the skull and the contra-coup is the next point of contact when the brain oscillates and strikes the opposite part of the inside of the skull.

[0025] The inside of the skull has a series of sharp bony ridges in the front of the skull and when the brain is banged against these ridges it is mechanically torn resulting in a contusion. These contusion injuries are typically in the front of the brain damaging key regions involved in cognitive and emotional control.

[0026] Shear injuries involve tearing of axonal fibers. The brain and its axonal fibers are extremely sensitive to rotational forces. Boxers can withstand hundreds of punches directly in the face but a single round-house punch or upper cut where the force comes in from the side or bottom of the jaw will cause acute rotation of the skull and brain and typically a knock-out. If the rotational forces are severe enough, the result is tearing of axons.

[0027] Figure 1 below shows how different forces affect axons. Compression 101 and tension 103 can remove the protective coating on an axon referred to as a myelin sheath. The myelin can be viewed as the rubber coating on a wire. If the internal wire of the axon is not cut the myelin can re-grow and re-coat the “wire” which can resume axonal function and brain communication. If rotational forces are significant, shear forces 105 tear the axon. This elevates the problem since the ends of cut axons do not re-attach. This results in a permanent neurological deficit and is referred to as diffuse axonal injury (DAI), a major cause of long-term neurological disability after TBI.

[0028] Some more modern pieces of protective gear have been introduced with the awareness that significant injuries besides musculoskeletal or flesh injuries in a variety of activities require new protective gear designs.

[0029] U.S. Patent 7,076,811 issued to Puchalski describes a helmet with an impact absorbing crumple or shear zone. "The shell consists of three (or more) discrete panels that are physically and firmly coupled together providing rigid protection

under most circumstances, but upon impact the panels move relative to one another, but not relative to the user's head, thereby permitting impact forces to be dissipated and/or redirected away from the cranium and brain within. Upon impact to the helmet, there are sequential stages of movement of the panels relative to each other, these movements initially being recoverable, but with sufficient vector forces the helmet undergoes structural changes in a pre-determined fashion, so that the recoverable and permanent movements cumulatively provide a protective `crumple zone` or `shear zone`."

[0030] U.S. Patent 5,815,846 issued to Calonge describes "An impact resistant helmet assembly having a first material layer coupled to a second material layer so as to define a gas chamber therebetween which contains a quantity that provides impact dampening upon an impact force being applied to the helmet assembly. The helmet assembly further includes a containment layer disposed over the second material layer and structured to define a fluid chamber in which a quantity of fluid is disposed. The fluid includes a generally viscous gel structured to provide some resistance against disbursement from an impacted region of the fluid chamber to non-impacted regions of the fluid chamber, thereby further enhance the impact distribution and dampening of the impact force provided by the helmet assembly."

[0031] U.S. Patent 5,956,777 issued to Popovich describes "A helmet for protecting a head by laterally displacing impact forces, said helmet comprising: a rigid inner shell formed as a single unit; a resilient spacing layer disposed outside of and in contact with said inner shell; and an articulated shell having a plurality of discrete rigid segments disposed outside of and in contact with said resilient spacing layer and a plurality of resilient members which couple adjacent ones of said rigid segments to one another."

[0032] U.S. Patent 6,434,755 issued to Halstead describes a football helmet with liner sections of different thicknesses and densities. The thicker, softer sections would handle less intense impacts, crushing down until the thinner, harder sections take over to prevent bottoming out.

[0033] Still other ideas relate to using springs instead of crushable materials to manage the energy of an impact. Springs are typically associated with rebound, and energy stored by the spring is returned to the head. This may help in some instances, but can still cause significant neurological injury. Avoiding energy return to the head is a reason that non-rebounding materials are typically used.

[0034] Some of the protective gear mechanisms are not sufficiently biomechanically aware and are not sufficiently customized for particular areas of protection. These protective gear mechanisms also are not sufficiently active at the right time scales to avoid damage. For example, in many instances, materials like gels may only start to convert significant energy into heat after significant energy has been transferred to the brain. Similarly, structural deformation mechanisms may only break and absorb energy after a significant amount of energy has been transferred to the brain.

[0035] Current mechanisms are useful for particular circumstances but are limited in their ability to protect against numerous types of neurological damage. Consequently, an improved smart biomechanics aware and energy conscious protective gear mechanism is provided to protect against mechanical damage as well as neurological damage.

[0036] According to various embodiments, protective gear such as a helmet includes a container device to provide a structural mechanism for holding an energy and impact transformer. The design of this element could be a part of the smart energy conscious biomechanics aware design for protection. The energy and impact transformer includes a mechanism for the dissipation, transformation, absorption, redirection or force/energy at the right time scales (in some cases as small as a few milliseconds or hundreds of microseconds).

[0037] In particular embodiments, the container mechanism provides structure to allow use of an energy and impact transformer. The container mechanism may be two or three shells holding one or more layers of energy and impact transformer materials. That is, a multiple shell structure may have energy and impact transformer materials between adjacent shell layers. The shells may be designed to prevent direct penetration from any intruding or impeding object. In some examples, the outer shell

may be associated with mechanisms for impact distribution, energy transformation, force dampening, and shear deflection and transformation. In some examples, the container mechanism can be constructed of materials such as polycarbonate, fiberglass, Kevlar, metal, alloys, combinations of materials, etc.

[0038] According to various embodiments, the energy and impact transformer provides a mechanism for the dissipation, transformation, absorption, and redirection of force and energy at the appropriate time scales. The energy and impact transformer may include a variety of elements. In some examples, a mechanical transformer element connects multiple shells associated with a container mechanism with mechanical structures or fluids that help transform the impact or shear forces on an outer shell into more benign forces or energy instead of transferring the impact or shear forces onto an inner shell.

[0039] In some examples, a mechanical transformer layer is provided between each pair of adjacent shells. The mechanical transform may use a shear truss-like structure connecting an outer shell and an inner shell that dampens any force or impact. In some examples, shear truss structure layers connect an outer shell to a middle shell and the middle shell to an inner shell. According to various embodiments, the middle shell or center shell may slide relative to the inner shell and reduce the movement and/or impact imparted on an outer shell. In particular embodiments, the outer shell may slide up to several centimeters relative to the middle shell. In particular embodiments, the material used for connecting the middle shell to the outer shell or the inner shell could be a material that absorbs/dissipates mechanical energy as thermal energy or transformational energy. The space between the outer shell, the middle shell, and the inner shell can be filled with absorptive/dissipative material such as fluids and gels.

[0040] According to various embodiments, the energy and impact transformer may also include an electro-rheological element. Different shells may be separated by an electro-rheological element with electric field dependent viscosity. The element may essentially stay solid most of the time. When there is stress/strain on an outer shell, the electric field is activated so that the viscosity changes depending on the level of

stress/strain. Shear forces on an inner shell are reduced to minimize impact transmission.

[0041] In particular embodiments, the energy and impact transformer also includes a magneto-rheological element. Various shells may be separated by magneto rheological elements with magnetic field dependent viscosity. The element may essentially stay solid most of the time. When there is stress/strain on an outer shell, the magnetic field is activated so that the viscosity changes depending on the level of stress/strain. Shear forces on an inner shell are reduced to minimize impact transmission.

[0042] Electro-rheological and magneto-rheological elements may include smart fluids with properties that change in the presence of electric field or a magnetic field. Some smart fluids undergo changes in viscosity when a magnetic field is applied. For example, a smart fluid may change from a liquid to a gel when magnets line up to create a magnetic field. Smart fluids may react within milliseconds to reduce impact and shear forces between shells.

[0043] In other examples, foam and memory foam type elements may be included to absorb and distribute forces. In some examples, foam and memory foam type elements may reside beneath the inner shell. A magnetic suspension element may be used to actively or passively reduce external forces. An inner core and an outer core may be separated by magnets that resist each other, e.g. N-poles opposing each other. The inner and outer cores naturally would want to move apart, but are pulled together by elastic materials. When an outer shell is impact and the magnets are pushed closer, forces between the magnets increase through the air gap.

[0044] According to various embodiments, a concentric geodesic dome element includes a series of inner shells, each of which is a truss based geodesic dome, but connected to the outer geodesic through structural or fluidic mechanisms. This allows each geodesic structure to fully distribute its own shock load and transmit it in a uniform manner to the dome underneath. The sequence of geodesic structures and the separation by fluid provides uniform force distribution and/or dissipation that protects the inner most shell from these impacts.

[0045] In particular embodiments, a fluid/accordion element would separate an inner shell and an outer shell using an accordion with fluid/gel in between. This would allow shock from the outer core to be transmitted and distributed through the enclosed fluid uniformly while the accordion compresses to accommodate strain. A compressed fluid/piston/spring element could include piston/cylinder like elements with a compressed fluid in between that absorbs the impact energy while increasing the resistance to the applied force. The design could include additional mechanical elements like a spring to absorb/dissipate the energy.

[0046] In still other examples, a fiber element involves using a rippled outer shell with texture like that of a coconut. The outer shell may contain dense coconut fiber like elements that separate the inner core from the outer core. The shock can be absorbed by the outer core and the fibrous filling. Other elements may also be included in an inner core structure. In some examples, a thick stretchable gel filled bag wrapped around the inner shell could expand and contract in different areas to instantaneously transfer and distribute forces. The combination of the elasticity of a bag and the viscosity of the gel could provide for cushioning to absorb/dissipate external forces.

[0047] According to various embodiments, a container device includes multiple shells such as an outer shell, a middle shell, and an inner shell. The shells may be separated by energy and impact transformer mechanisms. In some examples, the shells and the energy and impact transformer mechanisms can be integrated or a shell can also operate as an energy and impact transformer.

[0048] Figure 2 illustrates one example of a particular piece of protective gear. Helmet 201 includes a shell layer 211 and a lining layer 213. The shell layer 211 includes attachment points 215 for a visor, chin bar, face guard, face cage, or face protection mechanism generally. In some examples, the shell layer 211 includes ridges 217 and/or air holes for breathability. The shell layer 211 may be constructed using plastics, resins, metal, composites, etc. In some instances, the shell layer 211 may be reinforced using fibers such as aramids. The shell layer 211 helps to distribute mechanical energy and prevent penetration. The shell layer 211 is typically made using lighter weight materials to prevent the helmet itself from causing injury.

[0049] According to various embodiments, a chin strap 221 is connected to the helmet to secure helmet positioning. The shell layer 211 is also sometimes referred to as a container or a casing. In many examples, the shell layer 211 covers a lining layer 213. The lining layer 213 may include lining materials, foam, and/or padding to absorb mechanical energy and enhance fit. A lining layer 213 may be connected to the shell layer 211 using a variety of attachment mechanisms such as glue or Velcro. According to various embodiments, the lining layer 213 is pre-molded to allow for enhanced fit and protection. According to various embodiments, the lining layer may vary, e.g. from 4mm to 40mm in thickness, depending on the type of activity a helmet is designed for. In some examples, custom foam may be injected into a fitted helmet to allow for personalized fit. In other examples, differently sized shell layers and lining layers may be provided for various activities and head sizes.

[0050] The shell layer 211 and lining layer 213 protect the skull nicely and have resulted in a dramatic reduction in skull fractures and bleeding between the skull and the brain (subdural and epidural hematomas). Military helmets use Kevlar to decrease penetrating injuries from bullets, shrapnel etc. Unfortunately, these approaches are not well designed to decrease direct forces and resultant coup-contra coup injuries that result in both contusions and compression-tension axon injuries. Furthermore, many helmets do not protect against rotational forces that are a core cause of a shear injury and resultant long-term neurological disability in civilian and military personnel. Although the introduction of Kevlar in military helmets has decreased mortality from penetrating head injuries, the survivors are often left with debilitating neurological deficits due to contusions and diffuse axonal injury.

[0051] Figure 3 illustrates one example of a container device system. According to various embodiments, protective gear includes multiple container devices 301 and 303. In particular embodiments, the multiple container devices are loosely interconnected shells holding an energy and impact transformer 305. The multiple container devices may be multiple plastic and/or resin shells. In some examples, the containers devices 301 and 303 may be connected only through the energy and impact transformer 305. In other examples, the container devices 301 and 303 may be loosely connected in a manner supplementing the connection by the energy and impact transformer 305.

[0052] According to various embodiments, the energy and impact transformer 305 may use a shear truss-like structure connecting the container 301 and container 303 to dampen any force or impact. In some examples, the energy and impact transformer 305 allows the container 301 to move or slide with respect to container 303. In some examples, up to several centimeters of relative movement is allowed by the energy and impact transformer 305.

[0053] In particular embodiments, the energy and impact transformer 305 could be a material that absorbs/dissipates mechanical energy as thermal energy or transformational energy and may include electro-rheological, magneto-rheological, foam, fluid, and/or gel materials.

[0054] Figure 4 illustrates another example of a container device system. Container 401 encloses energy and impact transformer 403. In some examples, multiple containers or multiple shells may not be necessary. The container may be constructed using plastic and/or resin. And may expand or contract with the application of force. The energy and impact transformer 403 may similarly expand or contract with the application of force. The energy and impact transformer 403 may receive and convert energy from physical impacts on a container 401.

[0055] Figure 5 illustrates one example of a multiple shell system. An outer shell 501, a middle shell 503, and an inner shell 505 may hold energy and impact transformative layers 511 and 513 between them. Energy and impact transformer layer 511 residing between shells 501 and 503 may allow shell 501 to move and/or slide with respect to middle shell 503. By allowing sliding movements that convert potential head rotational forces into heat or transformation energy, shear forces can be significantly reduced.

[0056] Similarly, middle shell 503 can move and slide with respect to inner shell 505. In some examples, the amount of movement and/or sliding depends on the viscosity of fluid in the energy and impact transformer layers 511 and 513. The viscosity may change depending on electric field or voltage applied. In some other examples, the amount of movement and/or sliding depends on the materials and structures of materials in the energy and impact transformer layers 511 and 513.

[0057] According to various embodiments, when a force is applied to an outer shell 501, energy is transferred to an inner shell 505 through a suspended middle shell 503. The middle shell 503 shears relative to the top shell 501 and inner shell 505. In particular embodiments, the energy and impact transformer layers 511 and 513 may include thin elastomeric trusses between the shells in a comb structure. The energy and impact transformer layers 511 and 513 may also include energy dampening/absorbing fluids or devices.

[0058] According to various embodiments, a number of different physical structures can be used to form energy and impact transformer layers 511 and 513. In some examples, energy and impact transformer layer 511 includes a layer of upward or downward facing three dimensional conical structures separating outer shell 501 and middle shell 503. Energy and impact transformer layer 513 includes a layer of upward or downward facing conical structures separating middle shell 503 and inner shell 505. The conical structures in energy and impact transformer layer 511 and the conical structures in energy and impact transformer layer 513 may or may not be aligned. In some examples, the conical structures in layer 511 are misaligned with the conical structures in layer 513 to allow for improved shear force reduction.

[0059] In some examples, conical structures are designed to have a particular elastic range where the conical structures will return to the same structure after force applied is removed. The conical structures may also be designed to have a particular plastic range where the conical structure will permanently deform if sufficient rotational or shear force is applied. The deformation itself may dissipate energy but would necessitate replacement or repair of the protective gear.

[0060] Conical structures are effective in reducing shear, rotational, and impact forces applied to an outer shell 501. Conical structures reduce shear and rotational forces applied from a variety of different directions. According to various embodiments, conical structures in energy and impact transformer layers 511 are directed outwards with bases situated on middle shell 503 and inner shell 505 respectively. In some examples, structures in the energy and impact transformer layer may be variations of conical structures, including three dimensional pyramid structures and three

dimensional parabolic structures. In still other examples, the structures may be cylinders,

[0061] Figure 6 illustrates one example of a multiple shell helmet. According to various embodiments, helmet 601 includes an outer shell layer 603, an outer energy and impact transformer 605, a middle shell layer 607, an inner energy and impact transformer 609, and an inner shell layer 611. The helmet 601 may also include a lining layer within the inner shell layer 611. In particular embodiments, the inner shell layer 611 includes attachment points 615 for a chin strap for securing helmet 601. In particular embodiments, the outer shell layer 603 includes attachment points for a visor, chin bar, face guard, face cage, and/or face protection mechanism 615 generally. In some examples, the inner shell layer 611, middle shell layer 607, and outer shell layer 603 includes ridges 617 and/or air holes for breathability. The outer shell layer 603, middle shell layer 607, and inner shell layer 611 may be constructed using plastics, resins, metal, composites, etc. In some instances, the outer shell layer 603, middle shell layer 607, and inner shell layer 611 may be reinforced using fibers such as aramids. The energy and impact transformer layers 605 and 609 can help distribute mechanical energy and shear forces so that less energy is imparted on the head.

[0062] According to various embodiments, a chin strap 621 is connected to the inner shell layer 611 to secure helmet positioning. The various shell layers are also sometimes referred to as containers or casings. In many examples, the inner shell layer 611 covers a lining layer (not shown). The lining layer may include lining materials, foam, and/or padding to absorb mechanical energy and enhance fit. A lining layer may be connected to the inner shell layer 611 using a variety of attachment mechanisms such as glue or Velcro. According to various embodiments, the lining layer is pre-molded to allow for enhanced fit and protection. According to various embodiments, the lining layer may vary, e.g. from 4mm to 40mm in thickness, depending on the type of activity a helmet is designed for. In some examples, custom foam may be injected into a fitted helmet to allow for personalized fit. In other examples, differently sized shell layers and lining layers may be provided for various activities and head sizes.

[0063] The middle shell layer 607 may only be indirectly connected to the inner shell layer 611 through energy and impact transformer 609. In particular embodiments, the middle shell layer 607 floats above inner shell layer 611. In other examples, the middle shell layer 607 may be loosely connected to the inner shell layer 611. In the same manner, outer shell layer 603 floats above middle shell layer 607 and may only be connected to the middle shell layer through energy and impact transformer 605. In other examples, the outer shell layer 603 may be loosely and flexibly connected to middle shell layer 607 and inner shell layer 611. The shell layers 603, 607, and 611 provide protection against penetrating forces while energy and impact transformer layers 605 and 609 provide protection against compression forces, shear forces, rotational forces, etc. According to various embodiments, energy and impact transformer layer 605 allows the outer shell 603 to move relative to the middle shell 607 and the energy and impact transformer layer 609 allows the outer shell 603 and the middle shell 607 to move relative to the inner shell 611. Compression, shear, rotation, impact, and/or other forces are absorbed, deflected, dissipated, etc., by the various layers.

[0064] According to various embodiments, the skull and brain are not only provided with protection against skull fractures, penetrating injuries, subdural and epidural hematomas, but also provided with some measure of protection against direct forces and resultant coup-contra coup injuries that result in both contusions and compression-tension axon injuries. The skull is also protected against rotational forces that are a core cause of a shear injury and resultant long-term neurological disability in civilian and military personnel.

[0065] In some examples, the energy and impact transformer layers 605 and 609 may include passive, semi-active, and active dampers. According to various embodiments, the outer shell 603, middle shell 607, and the inner shell 611 may vary in weight and strength. In some examples, the outer shell 603 has significantly more weight, strength, and structural integrity than the middle shell 607 and the inner shell 611. The outer shell 603 may be used to prevent penetrating forces, and consequently may be constructed using higher strength materials that may be more expensive or heavier.

[0066] Although the foregoing invention has been described in some detail for purposes of clarity of understanding, it will be apparent that certain changes and modifications may be practiced within the scope of the appended claims. Therefore, the present embodiments are to be considered as illustrative and not restrictive and the invention is not to be limited to the details given herein, but may be modified within the scope and equivalents of the appended claims.

CLAIMS

1. Protective gear comprising:

a first layer;

a second layer connected to an first layer through a first energy transformer, the first energy transformer operable to absorb energy from forces imparted onto the first layer, wherein the first energy transformer includes a first absorptive/dissipative material to allow the first layer to slide relative to the second layer;

an third layer connected to the second layer through a second energy transformer, the second energy transformer including a second absorptive/dissipative material, the second energy transformer operable to absorb energy from forces imparted onto the second layer through the first layer and the first energy transformer.

2. The protective gear of claim 1, wherein the first absorptive/dissipative material comprises a gel.

3. The protective gear of claim 1, wherein the first absorptive/dissipative material comprises a fluid.

4. The protective gear of claim 1, wherein the first absorptive/dissipative material comprises an electro-rheological element.

5. The protective gear of claim 1, wherein the first layer is a first shell layer and the second layer is a second shell layer.

6. The protective gear of claim 1, wherein the first absorptive/dissipative material and the second absorptive/dissipative material are different.

7. The protective gear of claim 1, wherein mechanical forces include impact forces.

8. The protective gear of claim 1, wherein mechanical forces include rotational and shear forces.

9. The protective gear of claim 1, wherein a lining layer is connected to the third layer, wherein the lining layer is configured to conform to a human head.

10. Protective gear comprising:

a first layer;

a second layer connected to a first layer through a first energy transformer, the first energy transformer operable to absorb energy from forces imparted onto the first layer, wherein the first energy transformer includes an absorptive/dissipative material to allow the first layer to slide relative to the second layer;

a lining layer connected to the second layer, wherein the lining layer is configured to conform to a portion of a human body.

11. The protective gear of claim 10, wherein the absorptive/dissipative material comprises a gel.

12. The protective gear of claim 10, wherein the absorptive/dissipative material comprises a fluid.

13. The protective gear of claim 10, wherein the absorptive/dissipative material comprises an electro-rheological element.

14. The protective gear of claim 10, wherein the absorptive/dissipative material comprises a magneto-rheological element.

15. The protective gear of claim 10, wherein the first energy transformer comprises a magneto-rheological element.

16. The protective gear of claim 10, wherein mechanical forces include impact forces.

17. The protective gear of claim 10, wherein mechanical forces include rotational and shear forces.

18. A helmet comprising:

a first layer;

a second layer connected to a first layer through a first energy transformer, the first energy transformer operable to absorb energy from forces imparted onto the first layer, wherein the first energy transformer includes a first absorptive/dissipative mechanism to allow the first layer to slide relative to the second layer;

an third layer connected to the second layer through an second energy transformer, the second energy transformer including a second absorptive/dissipative mechanism, the second energy transformer operable to absorb energy from forces imparted onto the second layer through the first layer and the first energy transformer.

19. The helmet of claim 18, wherein a lining layer is connected to the third layer, wherein the lining layer is configured to conform to a portion of a human body.

20. The helmet of claim 18, wherein the lining layer comprises foam.

BIOMECHANICS AWARE PROTECTIVE GEAR

ABSTRACT OF THE DISCLOSURE

Protective gear includes an outer shell layer connected to a middle shell layer through an outer energy and impact transformer layer. The middle shell layer is connected to an inner shell layer through an inner energy and impact transformer layer. The outer and inner energy and impact transformer layers flexibly connect the shell layers to absorb impact forces, rotational forces, shear forces, etc., and allow the various shell layers to move and slide relative to the other shell layers. The outer and inner energy and impact transformer layers may be constructed using gels, fluids, electro-rheological elements, magneto-rheological elements, etc. The protective gear may be formed as helmets or body protection for various activities and protect users from not only impact and penetrative forces, but rotational and shear forces as well.

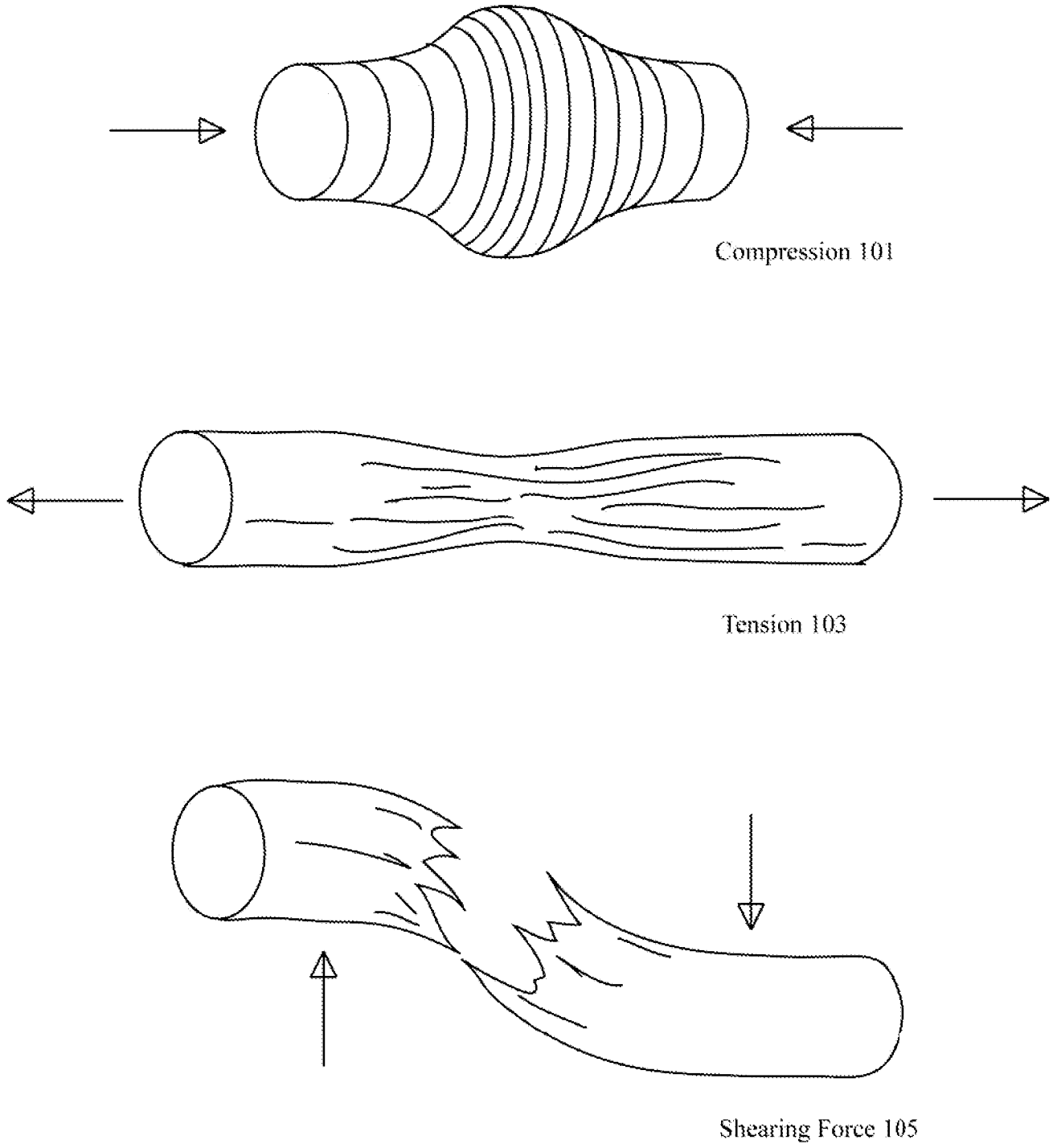

Figure 1

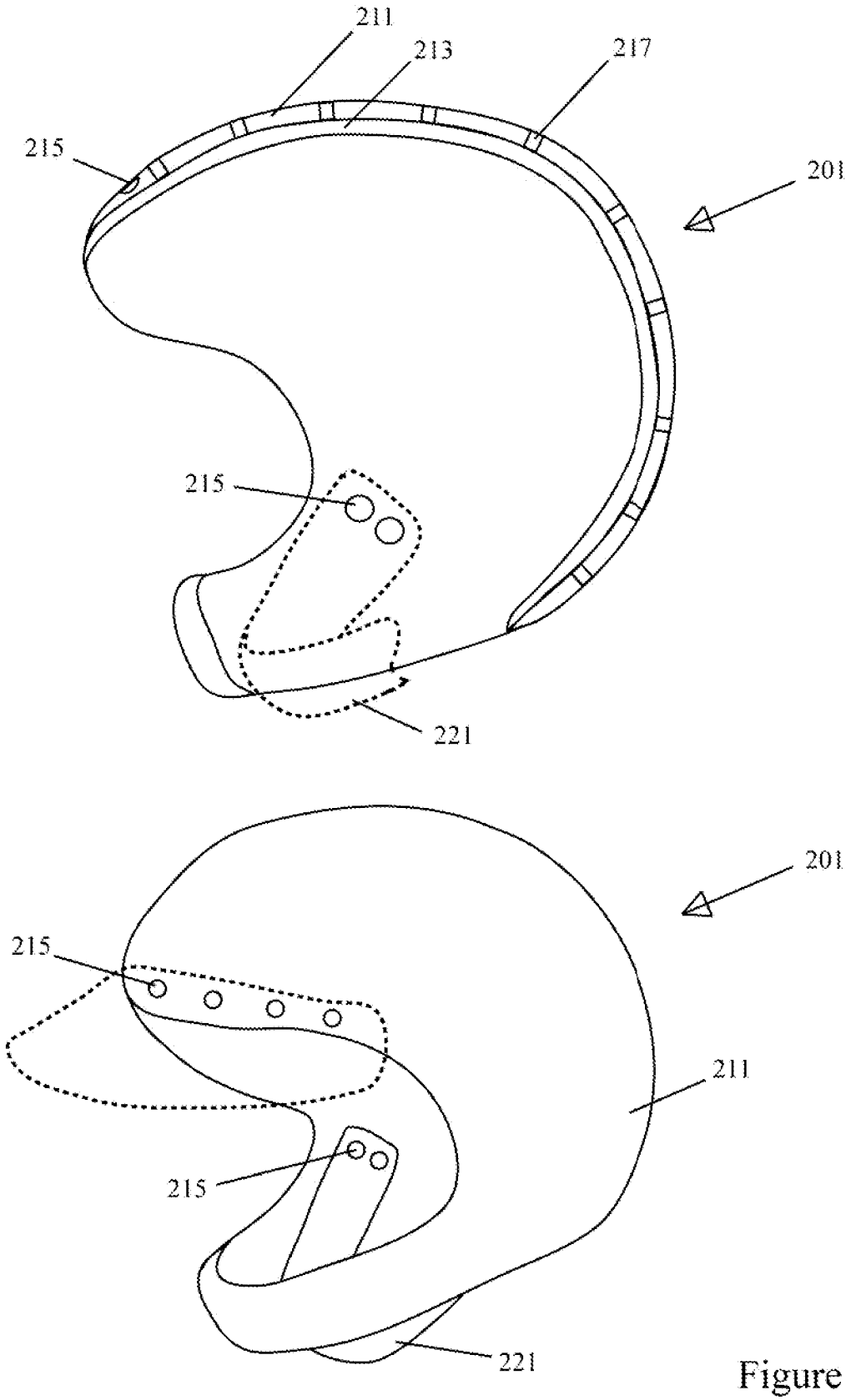

Figure 2

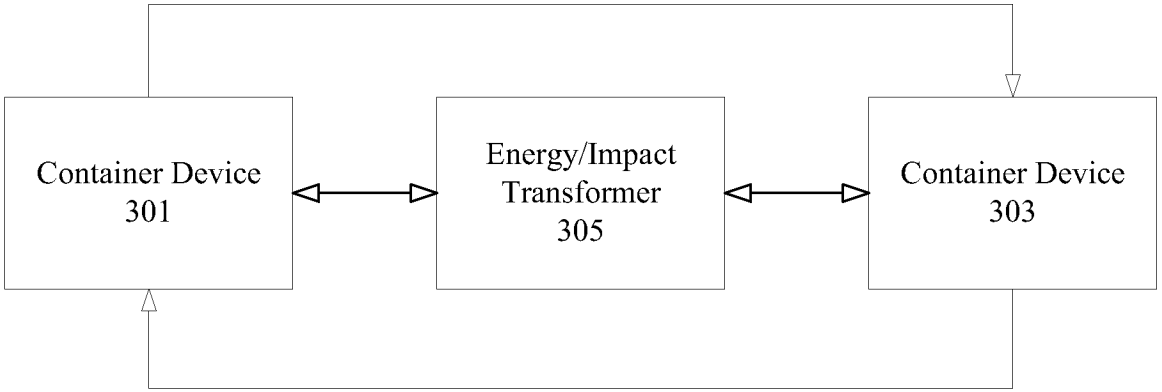
Container Device
301
Energy/Impact
Transformer
305
Container Device
303

Figure 3

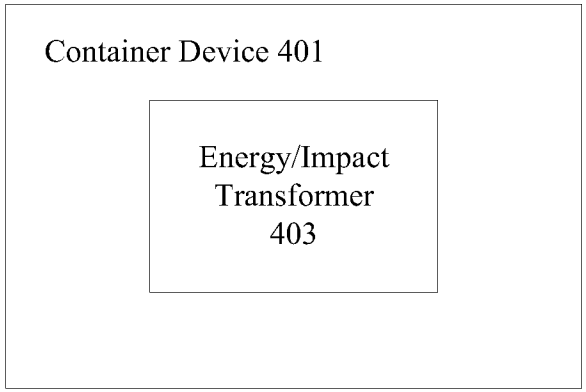

Figure 4

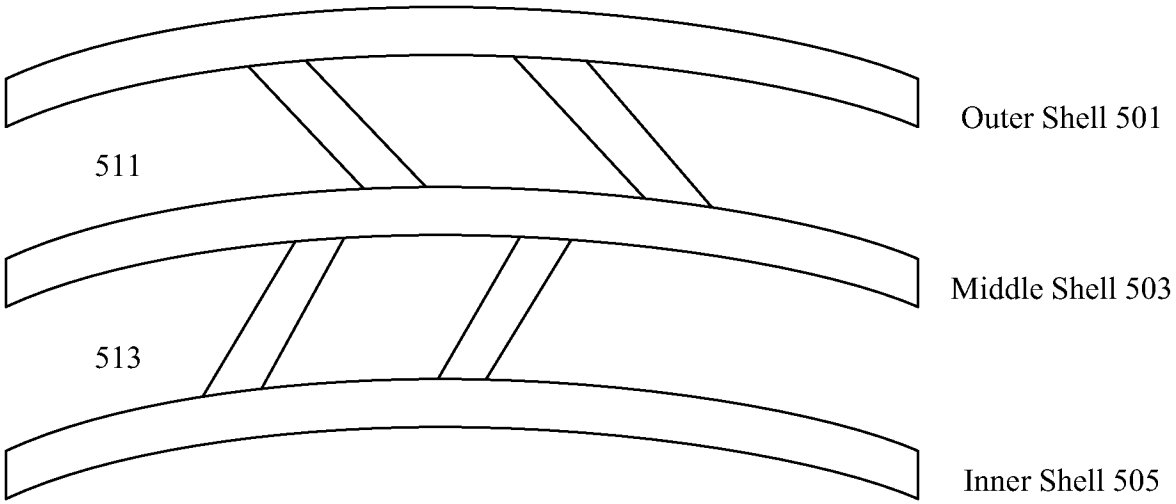

Figure 5

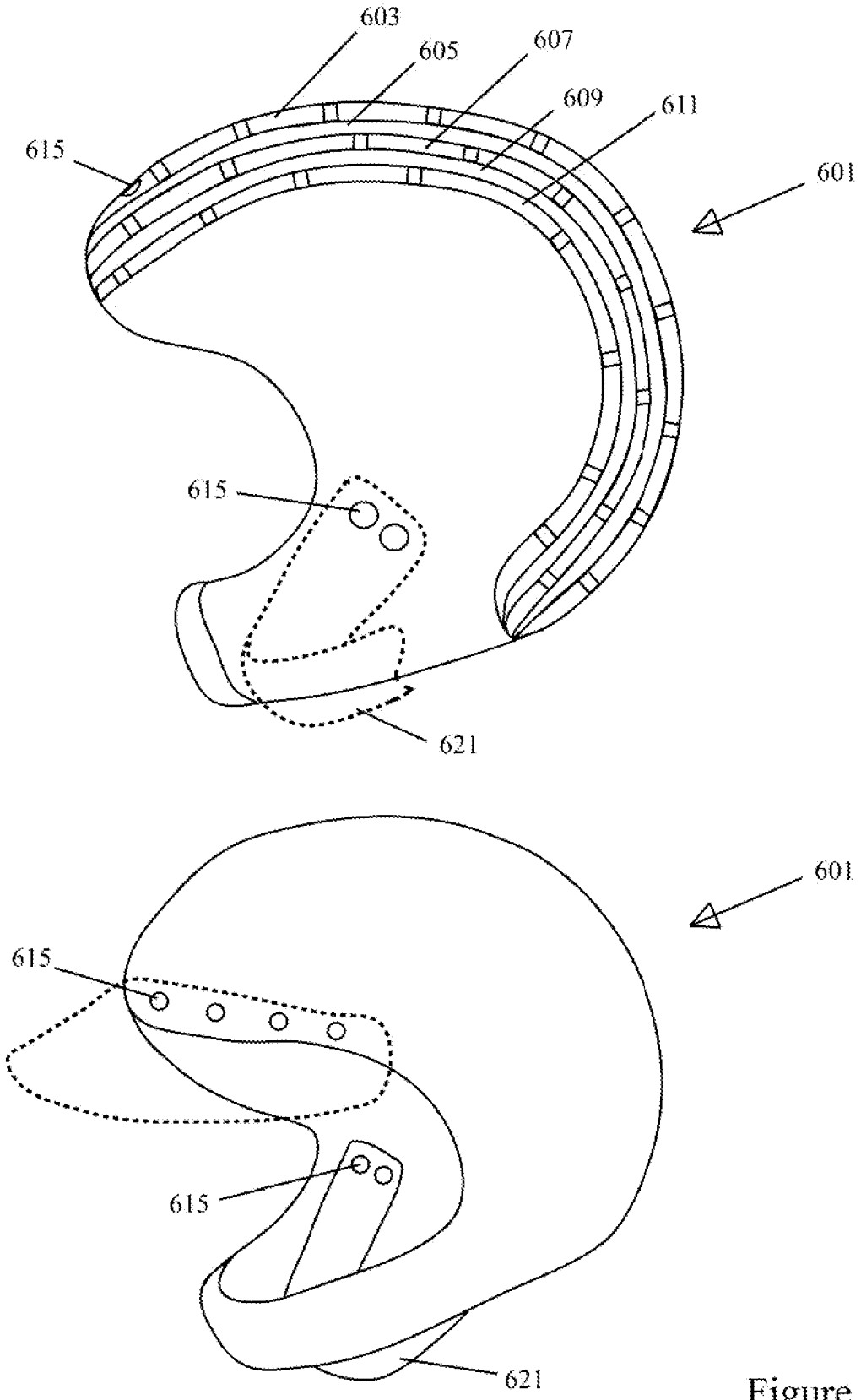

Figure 6

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	BIOMECHANICS AWARE HELMET

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____

filed on _____.

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

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

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

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LEGAL NAME OF INVENTOR

Inventor: Robert T. Knight Date (Optional): _____

Signature: Robert T Knight

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
14/714,093

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

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

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/714,093	05/15/2015	3765	730	BRGDP001C2	20	3

CONFIRMATION NO. 2486

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

FILING RECEIPT

OC000000075378952

Date Mailed: 05/27/2015

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

Inventor(s)

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Applicant(s)

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Assignment For Published Patent Application

Brainguard Technologies, Inc., El Cerrito, CA

Power of Attorney: The patent practitioners associated with Customer Number 19694

Domestic Priority data as claimed by applicant

This application is a CON of 14/485,993 09/15/2014
which is a CON of 13/554,471 07/20/2012 PAT 8863319
which claims benefit of 61/510,401 07/21/2011

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 05/26/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/714,093**
Projected Publication Date: 09/03/2015
Non-Publication Request: No
Early Publication Request: No
**** SMALL ENTITY ****

Title

BIOMECHANICS AWARE PROTECTIVE GEAR

Preliminary Class

002

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

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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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).

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2	2486

19694 7590 08/14/2015
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
PATEL, TAJASH D

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
08/14/2015	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):

docket@kwanip.com
alundy@kwanip.com

Office Action Summary	Application No. 14/714,093	Applicant(s) KNIGHT, ROBERT T.	
	Examiner TEJASH PATEL	Art Unit 3765	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on 5/15/15.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

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

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

Disposition of Claims*

5)☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-20 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

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

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

Application Papers

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

11)☒ The drawing(s) filed on 5/15/15 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 5/15/15.

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

4) ☐ Other: _____.

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

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

For case filed on/after 9/16/12, 37 CFR 1.321 specifies that the applicant can disclaim and the terminal disclaimer must specify the extent of the applicant's ownership. This can be done with a request under 37 CFR 1.46 (c) to change the applicant needs to be filed, which is (1) a request, signed by a 1.33 (b) party, (2) a corrected ADS (37CFR 1.76 (c)) that identifies the "new" applicant in the applicant information, and is underlined since it is new, and (3) a 3.73 (c) statement showing change of title to the new applicant. Along with 1.46 (c) request include a POA that gives power to the attorney who is signing the TD, along with another copy of the TD (No new fee required), unless the TD is signed by the applicant.

2. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 9,060,561. Although the claims at issue are not identical, they are not patentably distinct from each other because the protective gear of pending application '093 claims <u>a first layer connected to a second layer through a first energy transformer layer that allows the first and seconds layers to slide relative to one another and a third layer is connected to the second layer by a second energy transformer layer</u> which is substantially similar in scope to U.S. Patent '561 which claims

a helmet with a first outer shell layer connected to a second shell layer through a first energy transformer layer that allows the first and second shell layers to slide relative to one another and a third shell layer is connected to the second shell layer by a second energy transformer layer.

3. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319. Although the claims at issue are not identical, they are not patentably distinct from each other because the protective gear of pending application '093 claims a first shell layer connected to a second shell layer through a first energy transformer layer that allows the first and seconds shell layers to slide relative to one another and a third shell layer is connected to a second shell by a second energy transformer layer which is substantially similar in scope to U.S. Patent '319 which claims a helmet with an outer shell layer connected to a middle shell layer through an outer energy and impact transformer layer that allows the outer and middle shell layers to slide relative to one another and an inner shell layer is connected to the middle shell layer by an inner energy and impact transformer layer.

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Allowable Subject Matter

4. Claims 1-20 would be allowable if rewritten or amended to overcome the nonstatutory

double patenting rejection(s) set forth in this office action. Claims 1, 10 and 18 with its respective dependents are allowable because the prior art does not teach or suggest the recitation therein including a protector having a second layer connected to each of first and third layers by first and second energy transformer layers, respectively to absorb force of impact therebetween such that first and second layers substantially slides relative to one another while the second and third shells absorb energy through a second energy transformer layer imposed onto by the first transformer layer.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tejash Patel whose telephone number is (571) 272-4993. The examiner can normally be reached on Mon. –Thur. from 8am – 6pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Clinton Ostrup can be reached on (571) 272-5559. The fax phone number for this group is (571) 273-8300.

August 8, 2015

/Tejash Patel/
Primary Examiner

Notice of References Cited	Application/Control No. 14/714,093	Applicant(s)/Patent Under Reexamination KNIGHT, ROBERT T.	
	Examiner TEJASH PATEL	Art Unit 3765	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-8,863,319	10-2014	Knight, Robert T.	2/411
*	B	US-9,060,561	06-2015	Knight, Robert T.	1/1
*	C	US-8,104,593	01-2012	Lin, Keng-Hsien	188/372
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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	I	US-			
	J	US-			
	K	US-			
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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	Q					
	R					
	S					
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NON-PATENT DOCUMENTS

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

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

CPC- SEARCHED

Symbol	Date	Examiner
A 42B 3/322, A 42B 3/00, A 42B 3/06, A 42B 3/122, A 42B 3/14, A 42B 3/08, A 63B 71/10, A 42B 1/066, A 42B 3/04, A42B 3/064	8/8/15	TP

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
2	410, 411, 412, 413, 414, 416, 421, 425, 6.1, 6.2, 7	8/8/15	TP

SEARCH NOTES

Search Notes	Date	Examiner
PALM Searched	8/8/15	TP

INTERFERENCE SEARCH

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

	/TEJASH PATEL/ Primary Examiner.Art Unit 3765

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	Not Yet Assigned
	Filing Date	Herewith
	First Named Inventor	Robert T Knight
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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/T.P./		5713082		1998-02-03	Bassette, Aldean B., et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.P./

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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

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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]
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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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

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/T.P./		"International Application Serial No. PCT/US2012/047662, Search Report and Written Opinion mailed 10-05-12", 8 pgs.	
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/T.P./		"Lazer Helmets", [Online]. Retrieved from the Internet: < http://www.lazerhelmets.com/wp-content/uploads/2011/04/Catalogue-Motorcycling-2010-UK.pdf >, Accessed on 7/12/12, 54 pgs.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.P./

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	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	BRGDP001C2

EXAMINER SIGNATURE			
Examiner Signature	/Tajash Patel/	Date Considered	08/09/2015

*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.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2

CONFIRMATION NO. 2486

PUBLICATION NOTICE

OC000000077244682

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

Title:BIOMECHANICS AWARE PROTECTIVE GEAR

Publication No.US-2015-0245681-A1
Publication Date:09/03/2015

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Atty Dkt No.: BRGDP001C2
Application No.: 14/714,093	Examiner: Tajash D. Patel
Filed: May 15, 2015	Art Unit: 3765
Title: BIOMECHANICS AWARE PROTECTIVE GEAR	Confirmation: 2486

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on November 10, 2015.
Signed: /Amber Lundy/
Amber Lundy

OFFICE ACTION RESPONSE

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

In response to the Non Final Office Action dated August 14, 2015, Applicant submits terminal disclaimers to obviate double patenting rejections over prior patents 8,863,319 and 9,060,561.

It is believed that all claims are allowable over the rejections provided. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached using the contact information provided below.

Please charge any additional fees or credit any overpayment to Deposit Account 50-6367 (BRGDP001C2).

Respectfully submitted,

/Audrey Kwan/

Avery Audrey Kwan
Reg. No. 46,850

Kwan & Olynick LLP
2000 Hearst Ave, Ste 305
Berkeley, CA 94709
510-900-9501 x705
akwan@kwanip.com

Electronic Patent Application Fee Transmittal

Application Number:	14714093
Filing Date:	15-May-2015
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Avery Audrey Kwan/Amber Lundy
Attorney Docket Number:	BRGDP001C2

Filed as Large Entity

Filing Fees for **Utility under 35 USC 111(a)**

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	2	160	320
		Total in USD ($)		**320**

Electronic Acknowledgement Receipt

EFS ID:	24041927
Application Number:	14714093
International Application Number:	
Confirmation Number:	2486
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Avery Audrey Kwan/Amber Lundy
Filer Authorized By:	Avery Audrey Kwan
Attorney Docket Number:	BRGDP001C2
Receipt Date:	10-NOV-2015
Filing Date:	15-MAY-2015
Time Stamp:	16:29:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$320
RAM confirmation Number	3106
Deposit Account	
Authorized User	

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	BRGDP001C2_Terminal_Disclaimer_filed_11-10-15.pdf	137682 51ccdff522def8a0be68a2347128b397ae171e34	no	2
Warnings:					
Information:					
2	Terminal Disclaimer Filed	BRGDP001C2_Terminal_Disclaimer2_filed_11-10-15.pdf	137683 120cc6dcc9ea4892bc97f7ebd3168c354c99d8a6	no	2
Warnings:					
Information:					
3	Amendment/Req. Reconsideration-After Non-Final Reject	BRGDP001C2_Response_filed_11-10-15_.pdf	98121 29685d90de7995aec214edf6dc57a7fdd003d048	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30795 c8609955826df5385131f3dbcf8e0d8d8de7b6ff	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	404281		

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.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/AIA/26 (04-14)
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 displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
BRGDP001C2

In re Application of: Robert T. Knight

Application No.: 14/714,093

Filed: May 15, 2015

For:
BIOMECHANICS AWARE PROTECTIVE GEAR

The applicant, Brainguard Technologies, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 8,863,319 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46850

/Avery Audrey Kwan/	2015-11-10
Signature	Date

Avery Audrey Kwan
Typed or printed name

Attorney of Record	510-900-9501
Title	Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. 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 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.

PTO/AIA/26 (04-14)
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 displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) BRGDP001C2

In re Application of: Robert T. Knight

Application No.: 14/714,093

Filed: May 15, 2015

For:
BIOMECHANICS AWARE PROTECTIVE GEAR

The applicant, Brainguard Technologies, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 9,060,561 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46850

/Avery Audrey Kwan/	2015-11-10
Signature	Date

Avery Audrey Kwan
Typed or printed name

Attorney of Record	510-900-9501
Title	Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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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 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).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public 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 Number	Application/Control No.	Applicant(s)/Patent under Reexamination
	14/714,093	KNIGHT, ROBERT T.

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 11/10/15	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

2 td's
jean proctor

U.S. Patent and Trademark Office

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

19694 7590 12/31/2015
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
PATEL, TAJASH D

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 12/31/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2	2486

TITLE OF INVENTION: BIOMECHANICS AWARE PROTECTIVE GEAR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/31/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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

19694 7590 12/31/2015
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2	2486

TITLE OF INVENTION: BIOMECHANICS AWARE PROTECTIVE GEAR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/31/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, TAJASH D	3765	002-411000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

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

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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.
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2	2486

19694 7590 12/31/2015
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
PATEL, TAJASH D

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 12/31/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 14/714,093	Applicant(s) KNIGHT, ROBERT T.	
	Examiner TEJASH PATEL	Art Unit 3765	AIA (First Inventor to File) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Terminal Disclaimer filed on 11/10/15*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-20*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Tejash Patel/
Primary Examiner

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

CPC		
Symbol	**Type**	**Version**

CPC Combination Sets				
Symbol	**Type**	**Set**	**Ranking**	**Version**

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TEJASH PATEL/ Primary Examiner.Art Unit 3765 (Primary Examiner)	12/17/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED

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

NONE		Total Claims Allowed:
(Assistant Examiner)	(Date)	20
/TEJASH PATEL/ Primary Examiner.Art Unit 3765	12/17/2015	O.G. Print Claim(s) 1 / O.G. Print Figure 5
(Primary Examiner)	(Date)	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
3	3	19	19												
4	4	20	20												
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16	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TEJASH PATEL/ Primary Examiner.Art Unit 3765 (Primary Examiner)	12/17/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

CPC- SEARCHED

Symbol	Date	Examiner
A 42B 3/322, A 42B 3/00, A 42B 3/06, A 42B 3/122, A 42B 3/14, A 42B 3/08, A 63B 71/10, A 42B 1/066, A 42B 3/04, A42B 3/064	8/8/15	TP
Updated above search from 8/8/15	12/17/15	TP

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
2	410, 411, 412, 413, 414, 416, 421, 425, 6.1, 6.2, 7	8/8/15	TP
Updated	Above search from 8/8/15	12/17/15	TP

SEARCH NOTES

Search Notes	Date	Examiner
PALM Searched	8/8/15	TP

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
A42B	3/064	12/17/2015	TP

	/TEJASH PATEL/ Primary Examiner.Art Unit 3765

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

CPC

Symbol					Type	Version
A42B		3	/	063	F	2013-01-01
A42B		3	/	064	I	2013-01-01
A42B		3	/	04	I	2013-01-01
A42B		3	/	12	I	2013-01-01
A42B		3	/	121	I	2013-01-01
A41D		13	/	015	I	2013-01-01
A42B		3	/	125	I	2013-01-01
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CPC Combination Sets

Symbol					Type	Set	Ranking	Version
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TEJASH PATEL/ Primary Examiner.Art Unit 3765 (Primary Examiner)	12/17/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14714093	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	TEJASH PATEL	3765

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TEJASH PATEL/ Primary Examiner.Art Unit 3765 (Primary Examiner)	12/17/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	TEJASH PATEL	3765

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
3	3	19	19												
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15	15														
16	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TEJASH PATEL/ Primary Examiner.Art Unit 3765 (Primary Examiner)	12/17/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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

19694 7590 12/31/2015
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Amber Lundy	(Depositor's name)
/Amber Lundy/	(Signature)
January 26, 2016	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/714,093	05/15/2015	Robert T. Knight	BRGDP001C2	2486

TITLE OF INVENTION: BIOMECHANICS AWARE PROTECTIVE GEAR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/31/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, TAJASH D	3765	002-411000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Kwan & Olynick LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Brainguard Technologies, Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): El Cerrito, CA

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

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Audrey Kwan/ Date January 26, 2016

Typed or printed name Avery Audrey Kwan Registration No. 46850

Electronic Patent Application Fee Transmittal

Application Number:	14714093
Filing Date:	15-May-2015
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Avery Audrey Kwan/Amber Lundy
Attorney Docket Number:	BRGDP001C2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt

EFS ID:	24731141
Application Number:	14714093
International Application Number:	
Confirmation Number:	2486
Title of Invention:	BIOMECHANICS AWARE PROTECTIVE GEAR
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Avery Audrey Kwan/Amber Lundy
Filer Authorized By:	Avery Audrey Kwan
Attorney Docket Number:	BRGDP001C2
Receipt Date:	26-JAN-2016
Filing Date:	15-MAY-2015
Time Stamp:	20:19:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	5479
Deposit Account	
Authorized User	

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	BRGDP001C2_Issue_fee_filed_01-26-16.pdf	1598901 104b23f45e68e4070c7de4e421c6dbffdb92dabd	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30909 b539324493c467b096ba42cdf66aadfcfd25af9e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1629810		

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.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/714,093	03/01/2016	9271536	BRGDP001C2	2486

19694 7590 02/10/2016

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Robert T. Knight, Berkeley, CA;
Brainguard Technologies, Inc., El Cerrito, CA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :Dorethea Allen

Sale Accounting Date:08/18/2023

Sale Item Reference Number	Effective Date
14714093	08/17/2023

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20238HE35055906	2552	MAINTENANCE FEE DUE AT 7.5 YEARS	$1,504.00	Wire