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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	Unknown
Filing Date	Herewith
First Named Inventor	Knight, Robert
Art Unit	Unknown
Examiner Name	Unknown

Sheet	1	of	2	Attorney Docket No: BRGDP002

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Examiner Initials*	Cite No[1]	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[2]
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Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

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Sheet	2	of	2	Attorney Docket No: BRGDP002

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	**Cite No [1]**	**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[2]**
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DECLARATION
AND POWER OF ATTORNEY
FOR ORIGINAL U.S. PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **AN ENERGY AND IMPACT TRANSFORMER LAYER**, the specification of which,

(check one)

1. ☒ is attached hereto.

2. ☐ was filed on _____ as U.S. Application No. _____ and was amended on _____.

3. ☐ was filed on _____ as PCT International Application No. _____ and was amended on _____.

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

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Prior Foreign Application(s)

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or (f), or §365(b) of any foreign application for patent or inventor's certificate listed below, or under §365(a) of any PCT international application which designated at least one country other than the United States listed below, and I have identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT International application having a filing date before that of the application on which priority is claimed:

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Power of Attorney

And I hereby appoint the law firm of Kwan & Olynick LLP and all practitioners who are associated with the Customer Number 19694 as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Direct Correspondence To: **Customer Number 19694**

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

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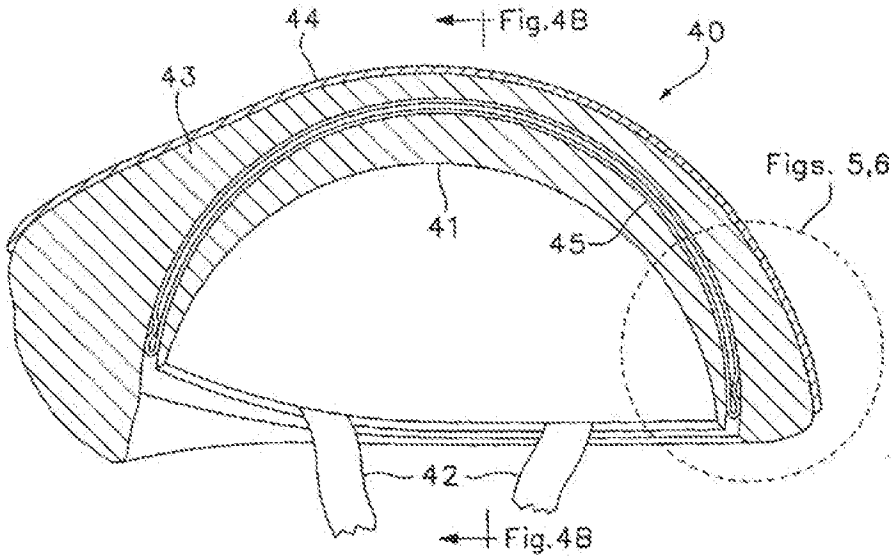
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(54) Title: HEAD PROTECTIVE DEVICES



(57) Abstract: A load-diverting helmet (40) contains an interface layer (45) disposed between inner (41) and outer helmet layers (43, 44). The inner helmet (41) layer is attached to a helmet retention system (42) that can be used to hold the inner helmet layer (41) to a wearer's head. When a tangential impact force is applied to the outer helmet layer (41), the interface layer (45) allows the outer helmet layer (41) to displace with respect to the inner helmet layer, thereby absorbing and/or diverting forces that would be transferred in a conventional helmet design to the wearer's head and neck as rotational acceleration.

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HEAD PROTECTIVE DEVICE

FIELD OF THE INVENTION

This invention relates generally to helmets and other head protective devices, and more particularly to methods and apparatus for lessening the transfer of oblique impact forces to an individual wearing such a device.

BACKGROUND OF THE INVENTION

Traumatic brain injury (TBI) is the leading cause of death and long-term disability in the USA among people below 45 years of age. In the U.S. alone, each year over two million people sustain traumatic brain injury, with a financial impact of about $4 billion annually. To alleviate the impact of TBI, a variety of task-specific helmets have been introduced. To date the use of helmets is no longer confined to high-risk occupational scenarios and motorcyclists, but appreciates wide-spread acceptance and even legal prescription for common recreational and sports activities, such as bicycling. Given the large number of helmets in use, even a small improvement in the protective effect of helmets will evoke a considerable benefit to the health status of the general population.

Helmets are designed to protect the brain and skull during an impact. Conventional helmets perform this function by distributing and absorbing a portion of an impact's kinetic energy by deforming (elastically or inelastically) a compliant layer. Typically, a permanently attached outer shell distributes the impact load, and an interior-padding layer absorbs impact energy. For an activity such as bicycling, the capabilities of the shell and padding layer represent a compromise between the need to maximize energy absorption and minimize object penetration, practical and aesthetic limitations on weight and thickness, and other

factors such as style, aerodynamics, head cooling, etc.

Figure 1 shows a traditional recreational sports hard shell helmet 20 in longitudinal cross-section. A padding layer 22 surrounds and is generally shaped to fit (usually with insert foam padding to adjust for a comfortable fit) the protected portion of the wearer's head. A hard outer shell 24 of glass-reinforced plastic, polycarbonate thermoplastics, or the like, is adhered to padding layer 22. A helmet retention system (e.g., straps 26) allows the user to attach the helmet securely to the head, usually with a chinstrap and increasingly with a suspended rear strap or member that aligns the helmet properly on the wearer's head. The helmet retention system usually attaches directly to outer shell 24.

Figure 2 shows, in cross-section, a micro-shell helmet 27, which has largely replaced the traditional hard shell helmet for most bicycle applications (primarily due to reduced weight). Helmet 27 uses a liner 22 manufactured from expanded polystyrene beads, designed to absorb kinetic energy upon impact. A tape strip (not shown) running along the lower edge of a plastic microshell 28 secures the plastic microshell to the exterior of liner 22. A helmet retention system 26 generally attaches to and/or loops through holes in liner 22. Upon substantial impact, the plastic microshell may tear apart or split, and the underlying liner may crack or shatter as it absorbs energy. Consequently, microshell helmet manufacturers typically recommend replacement after a single crash, even if helmet integrity appears uncompromised.

Particularly with microshell helmet designs, large cross-section integrated vents have been incorporated into the helmet as a selling feature. Figure 3 illustrates a vented microshell helmet 30 in longitudinal cross-section. Although similar in construction to helmet 27, microshell 28 and liner 32 contain substantial shaped voids or ports (e.g., 34) that ostensibly function as vents to allow some airflow through the helmet. The remaining polystyrene struts 32 may be quite thick, in order to restore at least part of the structural integrity lost due to

voids 34.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may be best understood by reading the disclosure with reference to the drawing, wherein:

Figures 1, 2, and 3 show longitudinal cross-sections of three prior art recreational helmet designs;

Figures 4A and 4B contain cross-sections of a helmet according to an embodiment of the invention, shown respectively in longitudinal and transverse cross section;

Figure 5 shows construction and functional detail of the embodiment of Figures 4A and 4B;

Figures 6 and 7 show construction and functional detail of another embodiment employing a different interface layer;

Figures 8A and 8B illustrate yet another embodiment of the invention, which incorporates air vents and uses an interface layer disposed near the outer helmet shell;

Figures 9A and 9B depict an interface layer comprising a lamellar structure, respectively under no-load and tangential force conditions;

Figures 10A and 10B depict an interface layer comprising adjacent rigid shells, respectively under no-load and tangential force conditions;

Figures 11A, 11B, and 11C depict an interface layer employing thin connecting members that pass through the interface layer, respectively under no-load, small tangential force, and large tangential force conditions;

Figure 12 illustrates one possible displacement response characteristic for a non-linear interface layer according to an embodiment of the invention;

Figure 13 shows the construction of an embodiment wherein connecting members are disposed around the periphery of air vents in a helmet; and

Figure 14 demonstrates test results for a standard helmet and an embodiment of the invention when subjected to an oblique impact with a concrete surface.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The increased use of bicycle helmets over the past decade does not seem to have reduced the incidence rate of traumatic brain injury per bicyclist, but has coincided with a 51% increase in the rate of head injuries per active cyclist. This phenomenon may only insufficiently be explained by a more aggressive riding attitude among bicyclists, based on a misleading sense of security provided by helmets. It is now recognized herein that this seeming incongruity may be accounted for, at least in part, by three specific deficiencies in the design of bicycle helmets.

First, prior bicycle helmets are primarily designed to distribute and absorb impact loads by means of a padding layer underlying a generally dome-shaped semi-rigid shell. This design is effective in distributing a focused impact over a larger area of the cranium to reduce the risk of skull fractures. Given geometric constraints of the padding layer, however, its ability to absorb a significant amount of energy is limited. Subsequently, the remaining energy will be transformed into acceleration of the head, where the amount and duration of head acceleration directly correlates to the extent of traumatic brain injury. Therefore, the design of contemporary bicycle helmets may effectively reduce the incident of skull fractures, but falls short in protecting its user from the disabling consequences of traumatic brain injury.

Second, bicycle helmets are primarily designed to absorb impact loads by means of energy-absorbing and load-distributing layers. This design greatly increases the distance of the impact site (i.e., the semi-rigid outer shell) from the apparent rotation axis of the head around the neck, therefore providing an effective lever arm to transform the tangential component of an oblique impact to the helmet into an angular acceleration of the head. Since

the brain is most susceptible to angular acceleration of the head, current helmet designs do not protect the head from closed-head traumatic brain injury due to angular acceleration, but may instead contribute to it.

Third, bicycle helmets are primarily designed to absorb impact loads by means of a padding layer underlying a generally dome-shaped semi-rigid shell. Traditional helmets (for motorcycling, skateboarding, etc., see Figure 1) employ a rigid, dome-shaped outer shell that tends to hold its shape and slide during impact. Modern bicycle helmets (see Figures 2 and 3) have a smooth, semi-rigid, non-continuous surface made of a considerably thin plastic layer. This thin shell primarily improves appearance and aerodynamics but is essentially unsuitable to bear or divert typical impact loads present during head impacts. As a method for energy absorption, the helmet surface (in combination with an underlying foam core) will deform to congruency with the surface geometry of the impacting object. Instead of diverting an impacting object and its associated kinetic energy, this congruency can lead to a prolonged impact duration, and the corresponding form lock between the impacting object and the helmet will cause an effective transfer of energy to the head instead of an effective energy diversion.

In summary, the inefficacy of bicycle helmets to divert tangential impact energy may dramatically limit their ability to decrease the amount and magnitude of head acceleration. The use of contemporary helmets may therefore be ineffective to reduce the incidence of closed head traumatic brain injury, and may in fact increase the stresses to the cervical spine. In contrast, the present invention provides a means of diverting and/or absorbing tangential impact energy before that energy is translated to the wearer's head and neck.

A first embodiment of the present invention is illustrated as helmet 40 of Figures 4A and 4B, in longitudinal and transverse cross-section. Helmet 40 comprises an inner helmet layer (e.g., an energy-absorbing layer) 41, a helmet retention system (e.g., straps 42 and foam

padding inserts, not shown) to affix inner helmet layer 41 to a wearer's head, an outer helmet layer (the combination of energy-absorbing layer 43 and microshell 44 in this embodiment), and an interface layer 45 disposed between the inner and outer helmet layers.

The inside surface of energy-absorbing layer 43 forms a cavity with a spherical curvature. Likewise, the exterior of energy-absorbing layer 41 has a spherical curvature with a slightly smaller radius than that of layer 43. During assembly, interface layer 45 is interposed between layers 41 and 43 and secured (e.g., by adhesive bonding) to the outer surface of layer 41 and the cavity surface of layer 43.

Interface layer 45 can provide, in essence, a spherical bearing of low/controlled friction to allow relative displacement between layers 41 and 43 under oblique impact conditions. Accordingly, assembled helmet 40 allows an inner helmet layer to remain affixed to a wearer's head, while allowing potentially large rotational displacement of outer layers 43 and 44 with respect to the inner layer (and the wearer's head) in response to an applied force.

Figure 5 illustrates further construction and operational details for this first embodiment. In this embodiment, interface layer 45 consists of a distensible flexible envelope filled to a desired thickness with a viscous medium 52. Viscous medium 52 can be, for example, a gel (e.g., silicone), a liquid (e.g., aqueous solutions, an oil, or other lubricant), and/or a filler comprising solid spherical particles. Segment 50 of the envelope is secured to the inner surface of outer helmet layer 43; segment 54 of the envelope is secured to the outer surface of inner helmet layer 41. Along the bottom edge of the interface, a "slack" section of the envelope can be left unattached, to readily permit some limited rotation, with any remaining rotation relying, for example, on distention of the envelope and/or partial separation of the envelope from the attached helmet layers. The slack section can also distend to displace portions of the viscous medium and absorb compression loads placed on the envelope.

Figure 5 depicts the application of an oblique force vector F to the outer helmet 44. Force vector F can be decomposed into two component vectors, one (F_{norm}) normal to the helmet surface at the point of impact, and the other (F_{tang}) acting along the helmet surface. The magnitude of F_{tang} will depend on the coefficient of friction between layer 44 and the striking object. It is noted, however, that large F_{norm} values will generally cause substantial deformation of layers 43, 44 when such use a traditional microshell construction, thereby increasing friction and F_{tang}.

In response to force vector F_{tang}, envelope 45 allows a rotational displacement R of the outer helmet layers with respect to the inner helmet layers, absorbing and/or deflecting at least a portion of a rotational component that would otherwise be communicated to the wearer's head. At the same time, envelope 45 may absorb a portion of force vector F_{norm} as viscous medium 52 pressurizes, forcing envelope 45 to distend along its periphery and allow some of viscous medium 52 to be displaced from between layers 41 and 43. Geometric and constitutive properties of the envelope and viscous medium, such as medium thickness and viscosity, the elastic modulus and area of unattached envelope at the helmet periphery, and the force required to separate the envelope from other helmet layers, can be adapted to meet specific shock-absorbing and shear-deflecting/absorbing properties for specific helmet applications.

An additional advantage that can be achieved in at least some embodiments is improved absorption of force vector F_{norm} due to the displacement of the impact site during impact. Materials such as foam will completely compress, or "bottom out", near the impact site for some value of F_{norm}. To reduce this phenomenon in a prior art helmet, typically one increases the foam thickness. In an embodiment with a displaceable outer layer, however, the area of the inner layer directly under the impact site will generally be changing over the duration of the impact. This movement increases the area over which the inner foam layer is

being compressed, thus potentially delaying and/or preventing bottoming out.

Figure 6 illustrates a second interface layer construction technique. In Figure 6, interface layer 45 consists of a hyper-elastic gel that can be bonded to the inner surface of layer 43 and the outer surface of layer 41 to ensure helmet integrity during normal use. The gel allows rotational displacement—and potentially separation—of the outer helmet assembly with respect to the inner helmet assembly when a tangential impact force is applied to the outer helmet. Further, depending on gel properties, layer 45 may act to absorb a portion of F_{norm} and/or further distribute that force before it is applied to inner helmet layer 41. Geometric and constitutive properties of interface layer 45, such as its thickness, viscosity, and/or elastic modulus can be adapted to meet specific shock-absorbing and shear-deflecting/absorbing properties for specific helmet applications.

Figure 7 illustrates the same helmet cross-section shown in Figure 6, but with a different impact force vector F typical of a cyclist going over her handlebars and hitting the pavement headfirst. In Figure 7, then, the resultant F_{tang} vector causes the outer helmet assembly to rotate forward to partially shield the wearer's face. Thus although not necessary in every embodiment, the helmet geometry can be designed to extend a portion of the outer helmet layers 43, 44 down past the original edge of the helmet due to displacement upon impact, potentially providing increased facial protection in a crash. Such a feature is not necessarily limited to forward rotation—with an appropriate design and a large displacement, the outer helmet layer can generally be designed to act as an extended shield to protect areas of the head that would otherwise not be covered by a protective shell.

In the preceding embodiments, the interface layer was interposed between two, e.g., expanded polystyrene layers. Figures 8A and 8B illustrate another helmet embodiment 80, respectively in transverse and longitudinal cross section, wherein an interface layer 84 is interposed between a rigid outer shell 85 and an energy-absorbing layer 81, 82. Preferably,

rigid outer shell 85 is constructed of a material such as glass-reinforced or carbon fiber-reinforced plastics/resin systems, polycarbonate, titanium, or perhaps high-density polyethylene. Although such an embodiment can potentially use a microshell, a microshell may tend to crack and tear upon impact, exposing the interface layer and allowing the impact surface to ablate the underlying interface layer. Depending on interface layer construction, this characteristic may or may not be tolerable—if not, a hard shell that resists deformation and tearing can be used.

Figures 8A and 8B show other features that may be desirable in a particular application. For instance, helmet 80 incorporates air vents (e.g., 86), with the interface layer attached to support pillars 81, 82 of the helmet. Helmet 80 also illustrates that the inner and outer helmet layers need not have coextensive head coverage (see hidden line 83 in Figure 8B, showing the lower edge 83 of the interface layer 84. In practice, a design may limit the extent of the interface to helmet areas that are most likely to strike the ground so as to cause rotational acceleration, e.g., the frontal helmet quadrants, provided that sufficient clearance is allowed for outer helmet assembly displacement upon impact.

Finally, helmet 80 shows a tail appendage 87 attached to the outside of shell 85. Tail appendage 87 can be used to impart aerodynamic or aesthetic qualities to the helmet without impeding the displacement function of interface layer 84. Other constructs can have, for instance, part of shell 85 covering part of interface layer 84 and part of shell 85 covering part of tail appendage 87, with tail appendage 87 attached directly to a part of interface layer 84.

In addition to the filled envelope and hyper-elastic gel embodiments already described, other interface layer constructions are possible. Figure 9A shows a section of a helmet with an outer helmet layer 90, an inner helmet layer 92, and an interface layer 94 disposed between layers 90 and 92. Interface layer 94 comprises a lamellar structure of hyper-elastic columns 96. Columns 96 buckle under an impact force to absorb impact

energy. And as shown in Figure 9B, application of a force F_{tang} to one of the helmet layers results in a relative displacement *d* as columns 96 bend and stretch in response to the tangential force, thereby deflecting and partially absorbing the tangential force.

The interface layer can also comprise multiple solid shell layers, as shown in Figure 10A. Although such layers can be buried between energy-absorbing layers within the helmet, Figure 10A shows an interface layer comprised of two solid shell layers 106 and 108 near the helmet exterior. Solid shell layer 106 attached to an outer helmet layer 100. Solid shell layer 108 attaches to an inner helmet layer 102. The solid shell layers can be designed to slide readily across each other in response to a force F_{tang} applied to the outer helmet layer (see Figure 10B), thereby deflecting the force instead of transmitting it to the inner helmet layer. Solid shell layers 106 and 108 can be constructed, for example, of materials that exhibit a low coefficient of friction, such as polyethylene or polytetrafluoroethylene (PTFE), and can further employ an intermediate lubricant to further reduce friction between layers 106 and 108.

Optionally, solid shell 106 can function alone as both outer shell 100 and as part of the displaceable interface of the helmet in some embodiments.

Shells 106 and 108 can be held together initially in a fixed position, e.g., by peripheral tape or another connecting member (to be explained below) designed to shear upon impact, thereafter allowing free (or freer) motion between the two shells.

The interface layer with multiple solid shell layers can also comprise more than one translation interface, as shown in Figures 10C and 10D. In Figure 10C, the interface layer 104 comprises four solid (rigid or semi-rigid) shell layers 106, 107, 108, and 109. The layers can be held together initially such that a sufficient force will free all layers to translate simultaneously (for instance, a single tape strip may hold all four layers to the remainder of the helmet). Or, different forces may be required to free the respective layers for translation.

Such an effect can be obtained, e.g., by securing the layers sequentially with multiple tape strips, by otherwise adhering adjacent layers together with different bonding strength materials or different adhesive coverage, using different lubricants between different layers, using differing numbers or thicknesses of connecting members between different pairs of layers, etc. Layers 106, 107, 108, and 109 need not be coextensive—for instance, more layers can be placed in locations likely to receive impacts with larger translational force components. Selected layers also can be segmented, such that one section of the layer can translate independent of other sections of that layer.

Translation between adjacent pairs of these four shell layers 106, 107, 108, and 109 is allowed under impact conditions. For instance, Figure 10D shows the response of part of interface layer 104 under a localized tangential force, where the right side of layers 106, 107, and 108 have begun translating. The layers may be designed to allow tearing of a portion of the layer, or can be pre-segmented such that designated portions of the layers can translate independent of other portions of the layer.

As shown in Figure 10D, layer 106 has undergone a relatively large translation while layers 107 and 108 have undergone relatively smaller translations. Such a behavior may be observable when the static and/or dynamic frictional properties have been tailored between the layers to provide a gradated response to tangential forces. Such behavior may be observable as well when the first layer 106 slides first toward a hard or soft limit in its allowable translation (such as might exist with a non-spherical translation interface), thus transferring more force to lower layers. Or, for instance, as layer 106 translates layer 107 can be exposed, such that an impacting object may contact both in such a way that further relative translation between the two layers becomes difficult or impossible, at which time the layer 107/108 and/or 108/109 interface begins moving to absorb further translational force.

With an interface layer that easily displaces in response to even slight tangential

forces, for example, it may be desirable to restrict such displacement prior to an impact event. Accordingly, Figure 11A shows an interface layer construction with a primary interface medium 114 disposed between an outer helmet layer 110 and an inner helmet layer 112. Intermittent connecting members 116 pass through primary interface medium 114 to join the inner and outer helmet layers. The connecting members 116 are depicted as integral to inner helmet layer 112, but can, in the alternative: be integral to outer helmet layer 110; contain sections integral to both the inner and outer helmet layers that are engaged/connected during assembly; or be completely separate from the inner and outer helmet layers until connected during assembly.

Preferably, connecting members 116 substantially prevent displacement of the outer helmet layer with respect to the inner helmet layer under normal usage and handling, thereby imparting a unitary feel to the helmet. For instance, Figure 11B illustrates the response of the interface layer 114 with connecting members 116 when a tangential force F_{tang} less than a design shear force F_S is applied to outer helmet layer 110. A small displacement *d* is observed as connecting members 116 resist the propensity of interface layer 114 to displace.

Connecting members 116 are designed to shear or otherwise disconnect, however, when a tangential force F_{tang} exceeds the design shear force F_S. The design shear force F_S is preferably set low enough that connecting members 116 fail at tangential impact forces indicative of a crash—and lower than a force that would cause a potentially injurious head acceleration. As shown in Figure 11C, once connecting members 116 fail, interface layer 114 can allow a relatively large displacement *D*.

In some embodiments, it may not be necessary that members 116 actually connect the inner and outer helmet layers. For instance, members 116 can substantially impede large displacements of a hyper-elastic layer by virtue of protruding through a portion of the layer's thickness and extending along the layer perpendicular to the direction in which displacement

is to be constrained.

Another way to view an interface layer with connecting and/or displacement-impeding members is as an interface layer that responds non-linearly to tangential forces. Figure 12 contains a graph 120 showing displacement of an outer layer 122 with respect to an inner layer 124 as a function of an applied tangential force F_{tang}. A connecting/displacement-impeding member 128 within an interface layer 126 initially resists tangential forces less than F_{PEAK} (shown for illustrative purposes at about 0.6 KN). Forces less than F_{PEAK} cause a relatively small and temporary displacement, with the helmet elastically restoring itself to zero displacement once the force is removed. Once F_{PEAK} is exceeded, however, member 128 fails, causing an inelastic change in the response characteristic of interface layer 126, which can then move through relatively large displacements in response to tangential forces much smaller than F_{PEAK}.

Connecting members can take a variety of forms. For instance, Figure 13 illustrates a cross-section of a vented helmet 130. Helmet 130 contains connecting members 139 molded into an inner helmet layer 132 at the periphery of air vents and along the outer periphery of the inner helmet layer 132 where it joins the outer periphery of an outer helmet layer 135. Accordingly, the outwardly facing surface of inner helmet layer 132 contains formed depressions, between connecting members 139, into which an interface medium 138 can be inserted. Outer helmet layer 135 is subsequently positioned as shown and adhered to both interface medium 138 and connecting members 139. Thus the cross-sectioned inner helmet support pillar 131 adheres to cross-sectioned outer helmet support pillar 134, encapsulating a portion of interface medium 138 and forming one surface of an air vent and a lower helmet exterior surface. Cross-sectioned inner helmet support pillar 133 adheres to cross-sectioned outer helmet support pillar 136, encapsulating another portion of interface medium 138 and forming two air vent surfaces. Similar construction can be used in the rest of the helmet.

Thus helmet 130 contains an encapsulated interface medium 138 and has the outward appearance of a prior art helmet. Under a large impact force, however, connecting members 139 readily fail, allowing the outer helmet assembly to rotate about the inner helmet assembly due to the previously described properties of interface medium 138.

Figure 14 shows the results of a guided free-fall drop test comparing a standard bicycle helmet with the same helmet type equipped with a low-friction interface layer. One standard helmet was modified by attaching a distensible silicone-filled envelope to the outside of the outer helmet layer. A segment of an outer helmet layer from an identical helmet was then attached to the outside of the silicone-filled envelope, forming a low-friction interface (LFI) helmet.

Drop tests on the standard and modified helmets were then performed by attaching the helmets to a headform with a hinged "neck" joint and dropping each helmet onto a concrete anvil. The concrete anvil had a top surface angled at 30 degrees to horizontal to simulate an oblique impact that might occur in a bicycle crash where a rider is launched onto pavement.

Peak linear acceleration, peak angular acceleration, and neck moment were measured for the standard and LFI helmets. Upon impact, the inner assembly of the LFI helmet translated parallel to the surface of the anvil, inducing a backward rotation of the head around the neck joint. The standard helmet did not slide on the anvil surface, and therefore induced a head flexion moment. The head flexion moment further form-locked the standard helmet to the anvil, prevented sliding of the standard helmet. Accordingly, compared to the standard helmet, the LFI helmet exhibited an 87% smaller peak linear acceleration, a 68% lower peak angular acceleration, and a 74% decrease in neck moments.

Helmet materials are widely selectable, depending on design. By way of example, energy-absorbing layers can be constructed of polystyrene foam, expanded polystyrene foam, hexagonal honeycomb structures, and the like. Some outer shell materials are: titanium /

titanium alloys; epoxies; fiberglass-epoxy composites; carbon-fiber-epoxy composites; polyethylene; polycarbonate; and fluoropolymers. Some potential interface layer materials are: silicon-based gels; hyper-elastic materials (e.g., rubber based on latex, silicon, or polyurethane); and sliding interface layer pairs of polyethylene, fluoropolymers, or polycarbonate. Those skilled in the art will recognize from the preceding disclosure the large number of potential combinations of these, as well as other materials not explicitly listed, that can be combined in an embodiment of the present invention.

One of ordinary skill in the art will recognize that the concepts taught herein can be tailored to a particular application in many other advantageous ways, and that the embodiments presented are merely exemplary. Some preferred embodiments utilize an interface layer with a spherical curvature, thus allowing rotational displacement of an outer helmet assembly in a plurality of axes of rotation. Other arrangements are possible, however. For instance, the helmet layers could contain features, such as longitudinal channels or ridges, that constrain displacement to fore-and-aft rotation. Or, particularly as the arc length of the interface decreases, it could depart significantly from a spherical curvature while still allowing considerable displacement. A displaceable outer helmet section that primarily protects the forward helmet quadrants could even employ a canted planar interface. Although the innermost layer in the described embodiments was an energy-absorbing layer, that layer can alternately be a hard layer, with the helmet retention system providing head cushioning.

Although the specification may refer to "an", "one", "another", or "some" embodiment(s) in several locations, this does not necessarily mean that each such reference is to the same embodiment(s), or that the feature only applies to a single embodiment.

WHAT IS CLAIMED IS:

1. A helmet comprising:

an inner helmet layer;

an outer helmet layer; and

an interface layer disposed between the inner and outer helmet layers, the interface layer allowing displacement of the outer helmet layer with respect to the inner helmet layer in response to a tangential impact force applied to the outer helmet layer.

2. The helmet of claim 1, wherein the outer helmet layer comprises a hard shell, and wherein the inner helmet layer comprises an energy-absorbing layer.

3. The helmet of claim 1, wherein the outer helmet layer comprises a first energy-absorbing layer and a microshell at least partially overlying the first energy-absorbing layer, and wherein the inner helmet layer comprises a second energy-absorbing layer.

4. The helmet of claim 1, further comprising a helmet retention system to secure the inner helmet layer to a wearer's head.

5. The helmet of claim 1, the helmet comprising features to constrain the allowable displacement to rotational displacement along a single axis of rotation.

6. The helmet of claim 1, wherein the interface layer has a spherical curvature, such that the allowable displacement comprises rotational displacement in a plurality of axes of rotation.

7. The helmet of claim 6, wherein the interface layer has a substantially uniform thickness.

8. The helmet of claim 1, wherein the interface layer substantially fills a gap between the inner and outer helmet layers.

9. The helmet of claim 1, further comprising a plurality of air vents passing through the inner and outer helmet layers to allow air movement between the exterior of the helmet and the interior of the helmet.

10. The helmet of claim 9, wherein a connecting member joins the inner and outer helmet layers around the periphery of one or more of the air vents.

11. The helmet of claim 10, wherein the connecting member substantially prevents displacement of the outer helmet layer with respect to the inner helmet layer, and fails when a tangential impact force indicative of a crash is applied to the outer helmet layer.

12. The helmet of claim 1, wherein at least one connecting member joins the inner and outer helmet layers, substantially prevents displacement of the outer helmet layer with respect to the inner helmet layer, and fails when a tangential impact force indicative of a crash is applied to the outer helmet layer.

13. The helmet of claim 12, wherein the connecting member is positioned around the

periphery of the helmet.

14. The helmet of claim 1, wherein the interface layer responds non-linearly to tangential forces, such that tangential forces less than a threshold force result in relatively small elastic displacements, and a tangential force larger than the threshold force causes an inelastic change in the interface layer after which tangential forces smaller than the threshold force cause relatively large displacements.

15. The helmet of claim 1, wherein the interface layer comprises an envelope attached to the inner and outer helmet layers, the envelope containing a viscous medium.

16. The helmet of claim 1, wherein the interface layer comprises a hyper-elastic structure.

17. The helmet of claim 16, wherein the hyper-elastic structure comprises a formable gel.

18. The helmet of claim 16, wherein the hyper-elastic structure comprises an elastomer-based lamellar structure.

19. The helmet of claim 1, wherein the outer helmet layer comprises a first solid shell, and the interface layer comprises a second solid shell attached to the inner helmet layer and in contact with the first solid shell, such that allowed displacement occurs between the first and second solid shells.

20. The helmet of claim 19, further comprising a lubricant disposed between the first and second solid shells.

21. The helmet of claim 19, further comprising at least a third solid shell sandwiched between the first and second solid shells, such that allowed displacement occurs between the first and third solid shells and between the second and third solid shells.

22. The helmet of claim 1, wherein the interface layer is adapted to at least partially dampen impact energy applied normal to the surface of the outer helmet layer.

23. The helmet of claim 1, wherein the outer helmet layer has a front lower surface capable of extending, during a forward displacement, to provide additional facial protection to a wearer.

24. The helmet of claim 1, wherein at least one displacement-impeding member protrudes into the interface layer from the inner or outer helmet layer, the at least one displacement-impeding member substantially impedes displacement of the outer helmet layer with respect to the inner helmet layer, and fails when a tangential impact force indicative of a crash is applied to the outer helmet layer.

25. The helmet of claim 1, wherein the outer helmet layer comprises a multilayer laminate structure, wherein the allowed displacement includes relative displacement between adjacent layers of the multilayer laminate structure such that the allowed displacement can occur at multiple interfaces within the overall helmet structure.

26. The helmet of claim 25, wherein at least one layer of the multilayer laminate structure has the capability to allow one portion of the at least one layer to translate in response

to a tangential impact force indicative of a crash while another portion of the at least one layer remains stationary.

27. The helmet of claim 25, wherein at least one of the multiple interfaces has different static frictional properties than another of the multiple interfaces.

28. The helmet of claim 27, wherein different static frictional properties exist at least in part due to differences in the manner of attaching different layers of the multilayer laminate structure to the overall helmet structure.

29. The helmet of claim 25, wherein at least one of the multiple interfaces has different dynamic frictional properties than another of the multiple interfaces.

30. A method of head protection, comprising:

joining an inner helmet layer, an outer helmet layer, and an interposed interface layer that allows relative displacement between the inner and outer helmet layers; and

in response to a tangential impact force applied to the outer helmet layer, displacing the outer helmet layer with respect to the inner helmet layer.

31. The method of claim 30, wherein displacing the outer helmet layer with respect to the inner helmet layer comprises responding to a tangential force less than a threshold force with a relatively small elastic displacement, and responding to a tangential force larger than the threshold force by inelastically changing the interface layer, after which tangential forces smaller than the threshold force cause relatively large

displacements.

32. The method of claim 31, wherein the interface layer comprises at least one connecting member connecting the outer and inner helmet layers, and wherein inelastically changing the interface layer comprises severing the connection formed by the connecting member.

33. The method of claim 30, wherein the interface layer has a substantially spherical curvature, and wherein displacing the outer helmet layer with respect to the inner helmet layer comprises rotationally displacing the outer helmet layer with respect to the inner helmet layer.

34. The method of claim 30, wherein the inner helmet layer comprises at least an energy-absorbing sublayer, the method further comprising absorbing normal impact forces applied to the outer helmet layer over an extended area of the inner helmet layer during the displacement of the outer layer.

35. A helmet comprising:

an inner helmet assembly having a first energy-absorbing layer and a helmet retention system to secure the first energy-absorbing layer to a wearer's head;

an outer helmet assembly having a second energy-absorbing layer; and

an interface layer disposed in a region of substantially spherical curvature between the inner and outer helmet assemblies, the interface layer allowing rotational displacement of the outer helmet assembly with respect to the inner helmet assembly in response to a tangential impact force applied to the outer helmet assembly.

36. The helmet of claim 35, further comprising at least one connecting element to attach the inner and outer helmet assemblies and substantially impede rotational displacement between the two assemblies until the helmet is subjected to a significant impact force.

37. The helmet of claim 35, further comprising at least one displacement-impeding element protruding from either the inner or outer helmet assembly into the interface layer and substantially impeding rotational displacement between the two assemblies until the helmet is subjected to a significant impact force.

38. A helmet comprising:

an inner helmet assembly having a first energy-absorbing layer and a helmet retention system to secure the first energy-absorbing layer to a wearer's head;

an outer helmet assembly having a rigid layer; and

an interface layer disposed in a region of substantially spherical curvature between the inner and outer helmet assemblies, the interface layer allowing rotational displacement of the outer helmet assembly with respect to the inner helmet assembly in response to a tangential impact force applied to the outer helmet assembly.

39. The helmet of claim 38, further comprising at least one connecting element to attach the inner and outer helmet assemblies and substantially impede rotational displacement between the two assemblies until the helmet is subjected to a significant impact force.

40. The helmet of claim 38, further comprising at least one displacement-impeding element protruding from either the inner or outer helmet assembly into the interface layer and substantially impeding rotational displacement between the two assemblies until the helmet is subjected to a significant impact force.

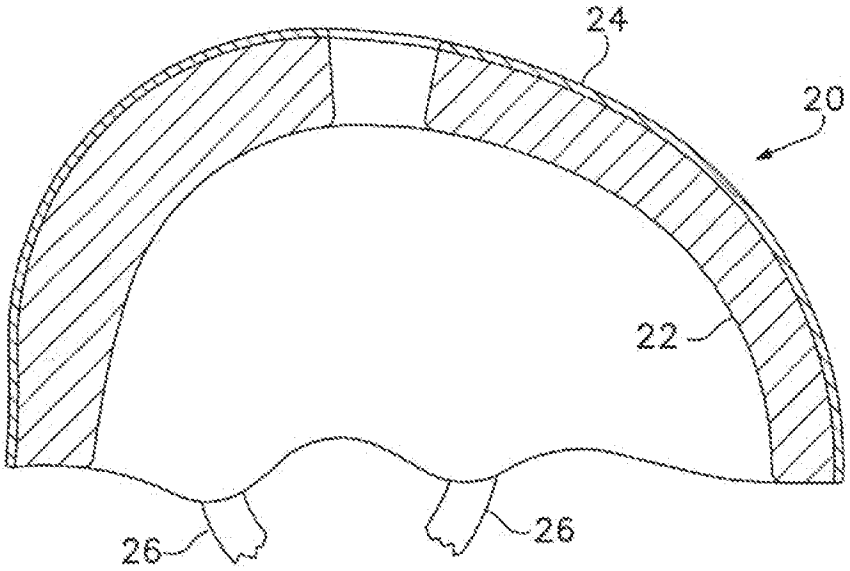


Fig.1
(PRIOR ART)

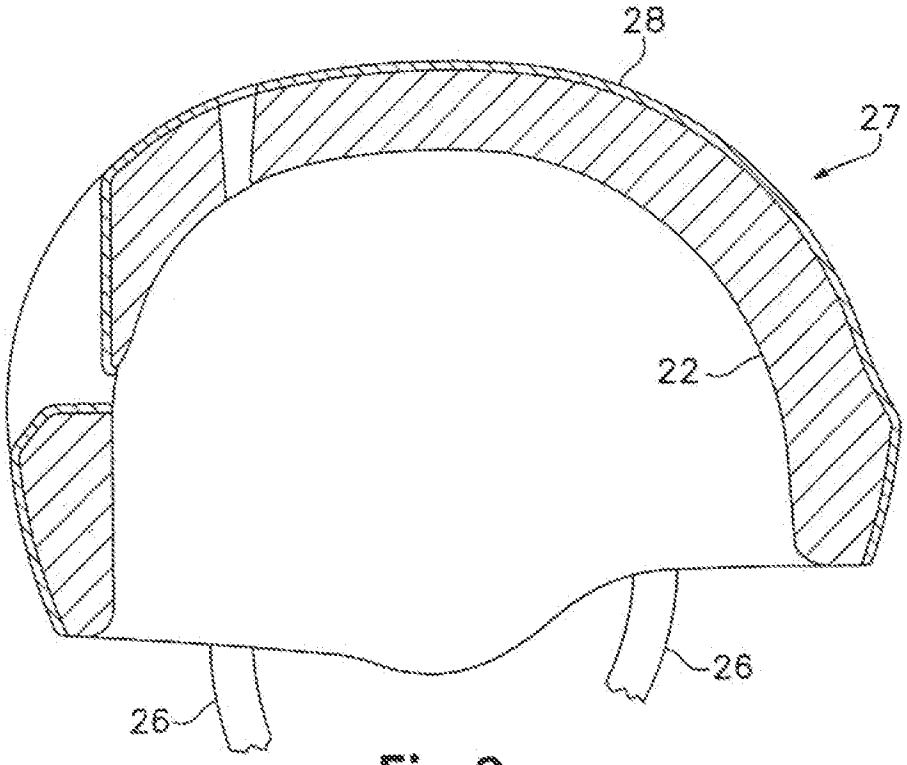


Fig.2
(PRIOR ART)

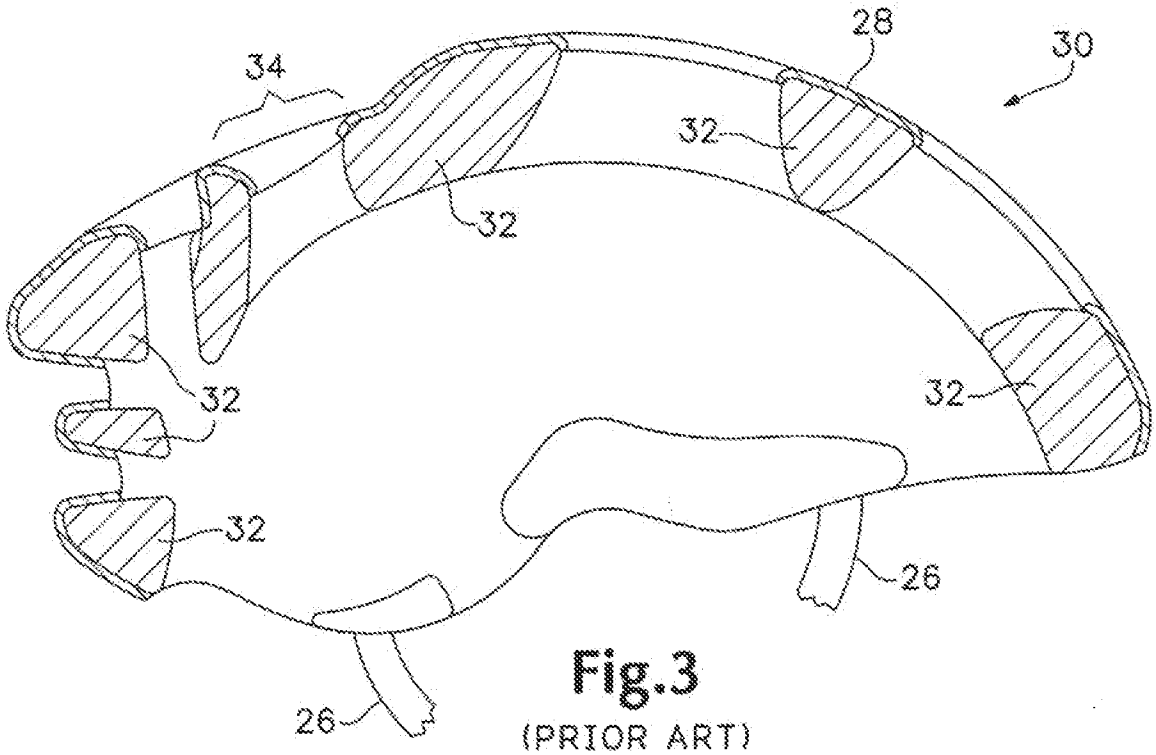


Fig.3
(PRIOR ART)

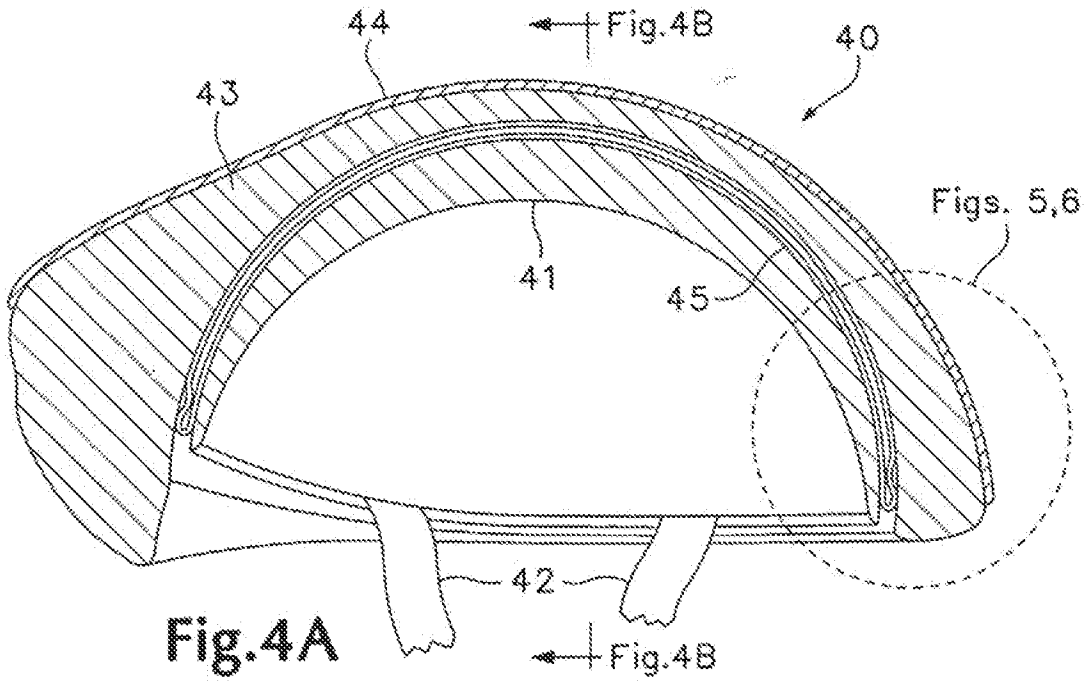


Fig.4A

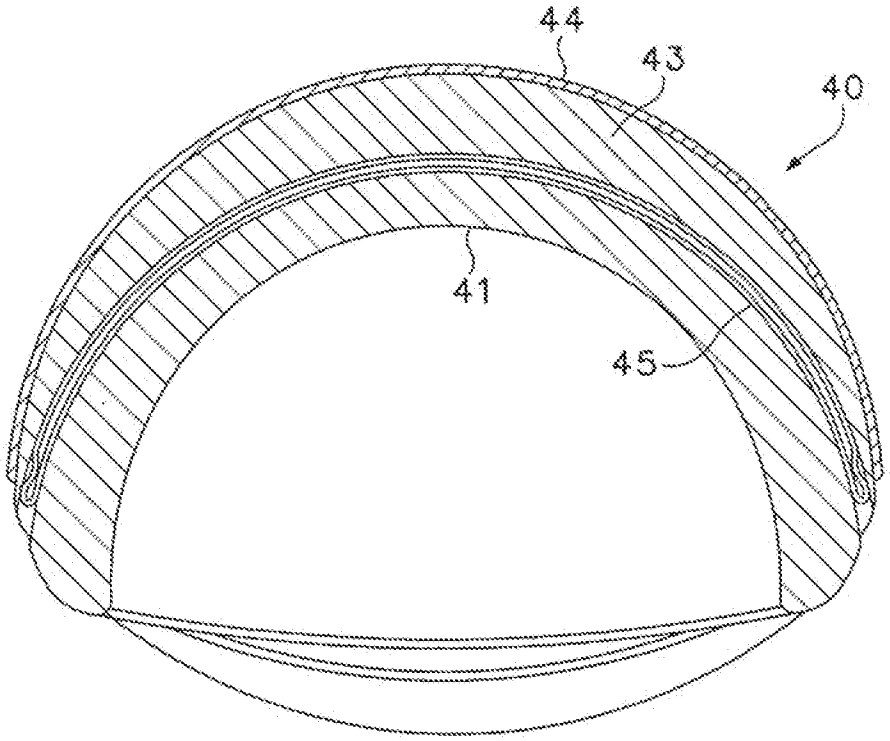


Fig.4B

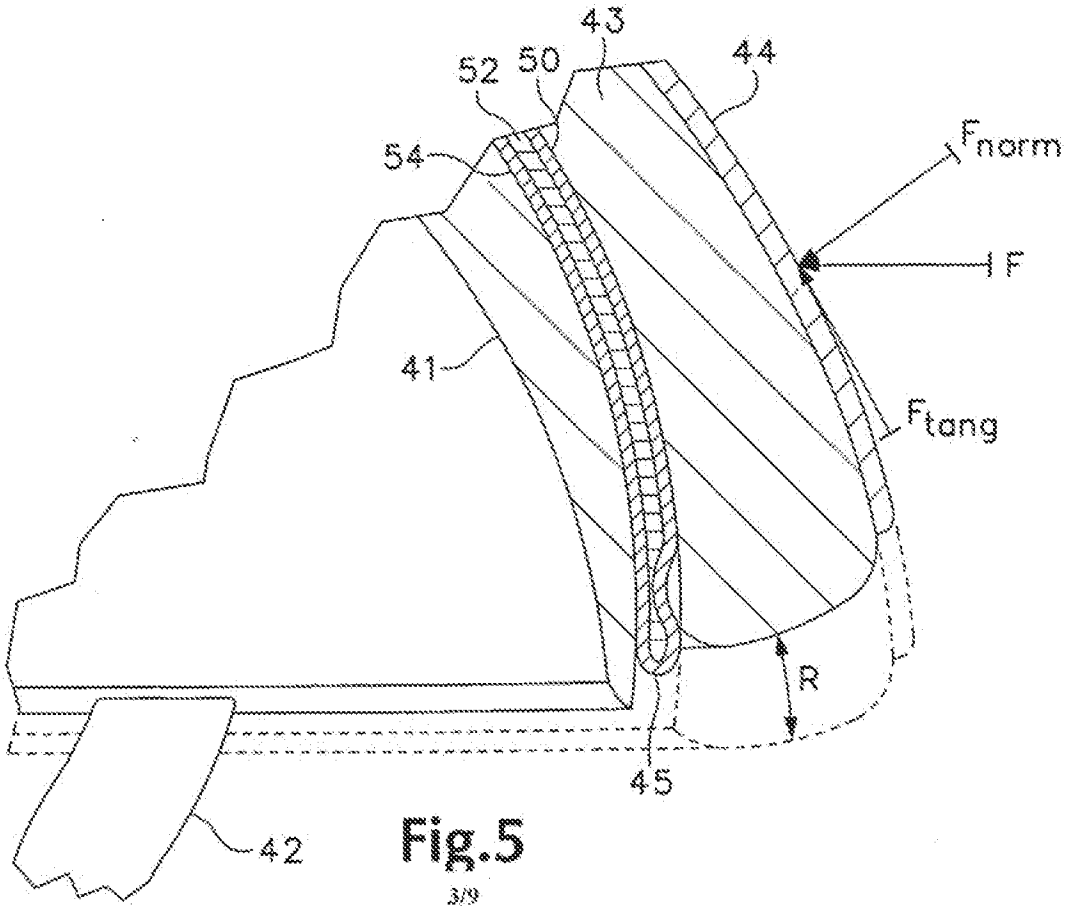


Fig.5

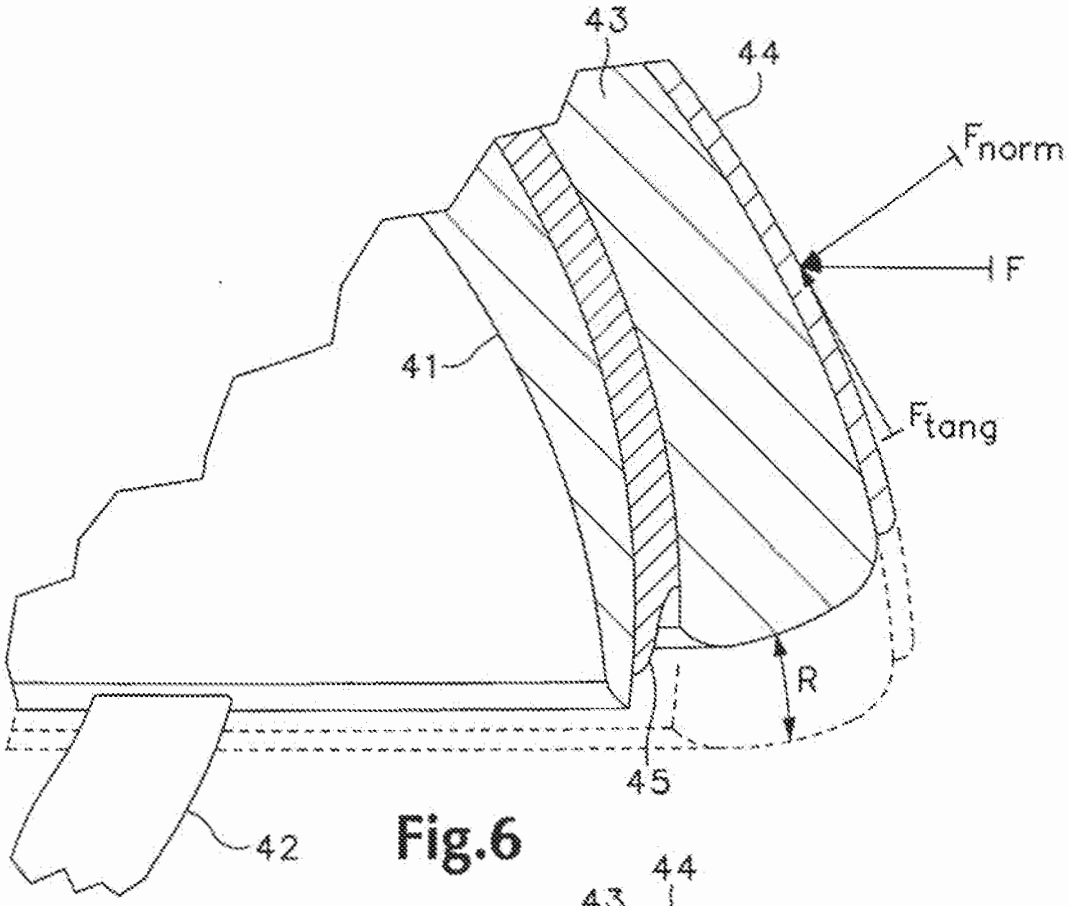


Fig.6

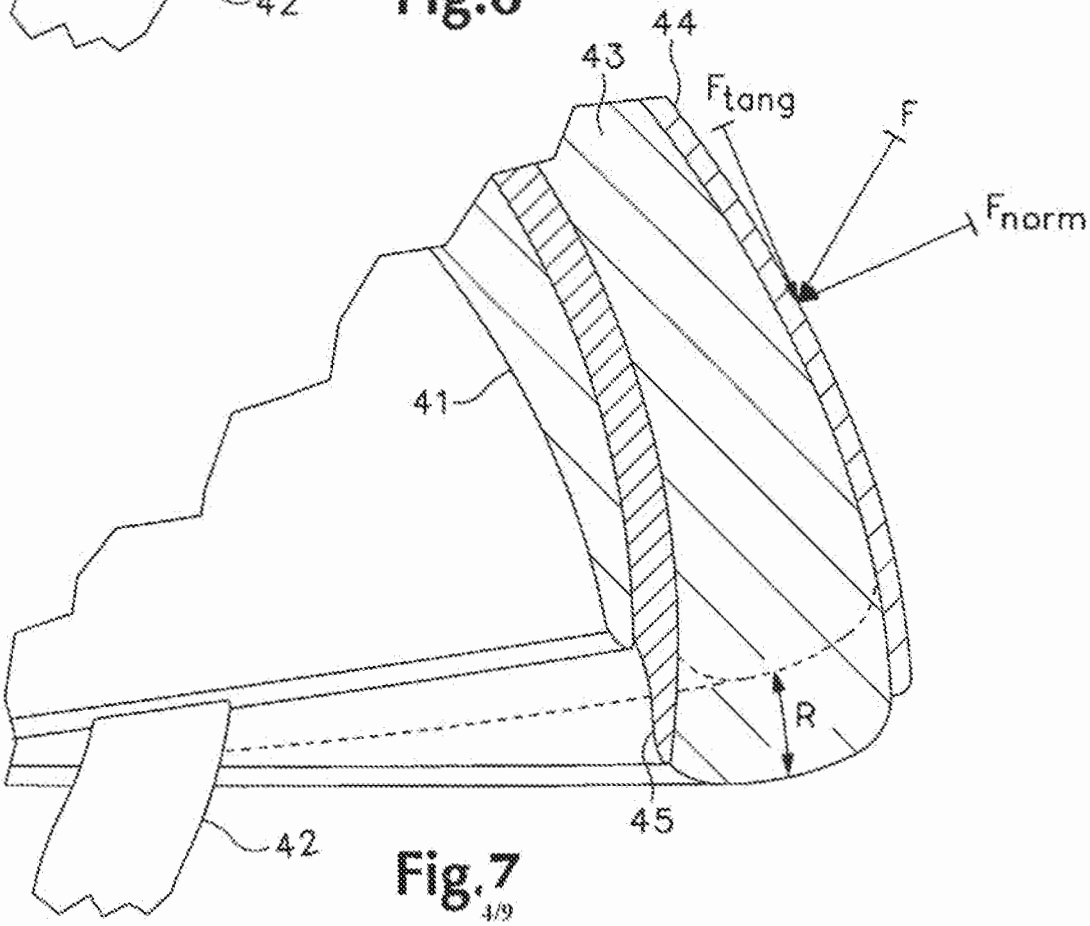


Fig.7

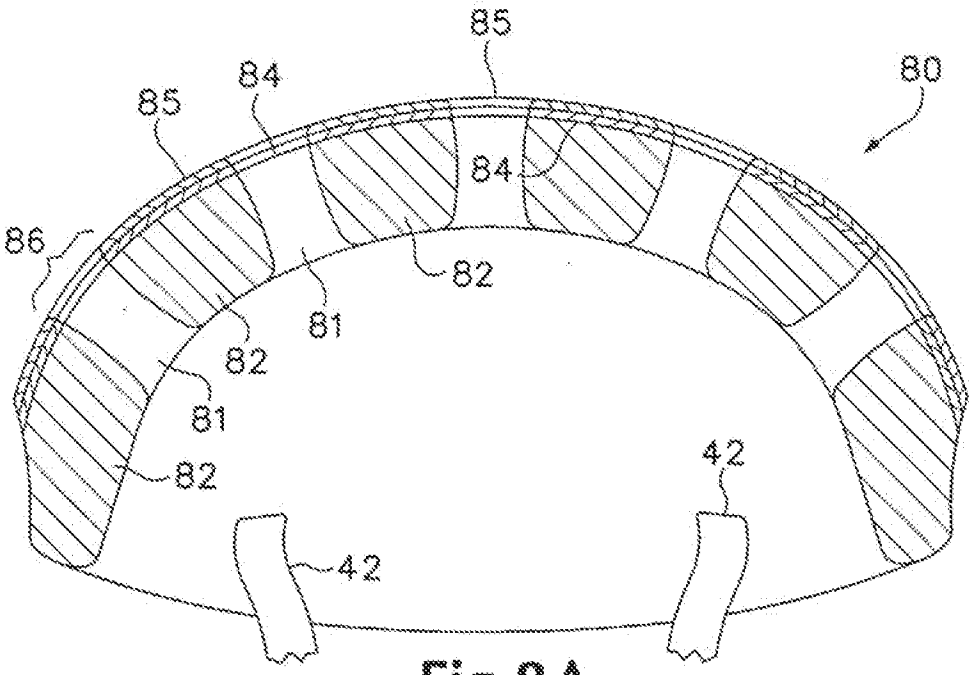

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Fig.8A

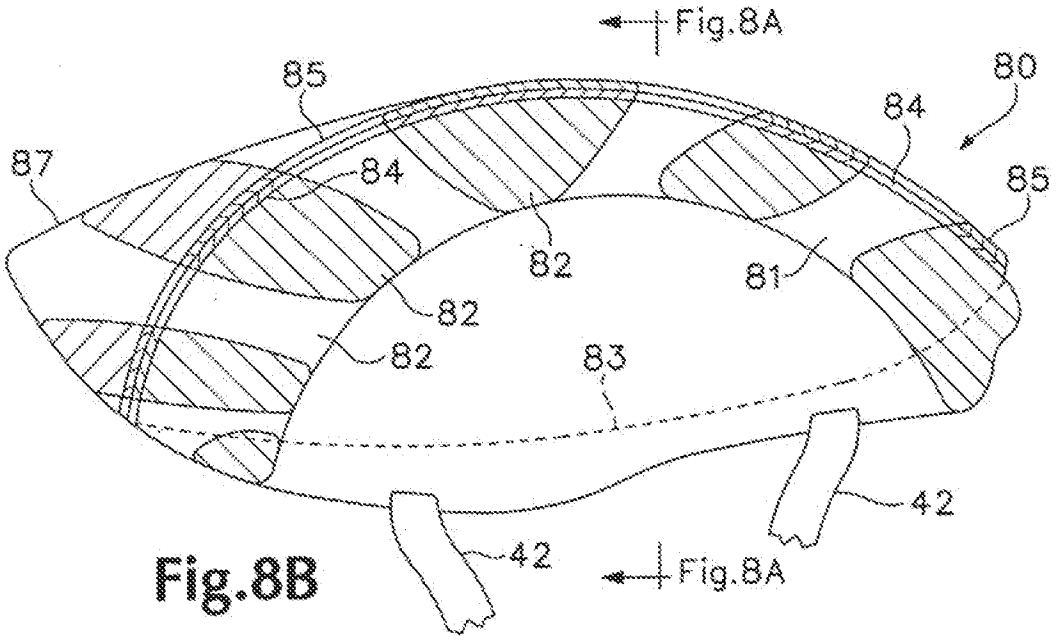

Fig.8A
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Fig.8A

Fig.8B

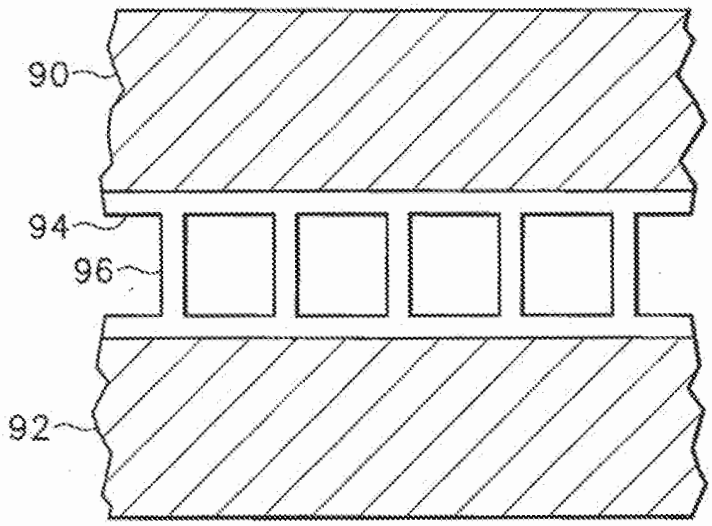


Fig.9A

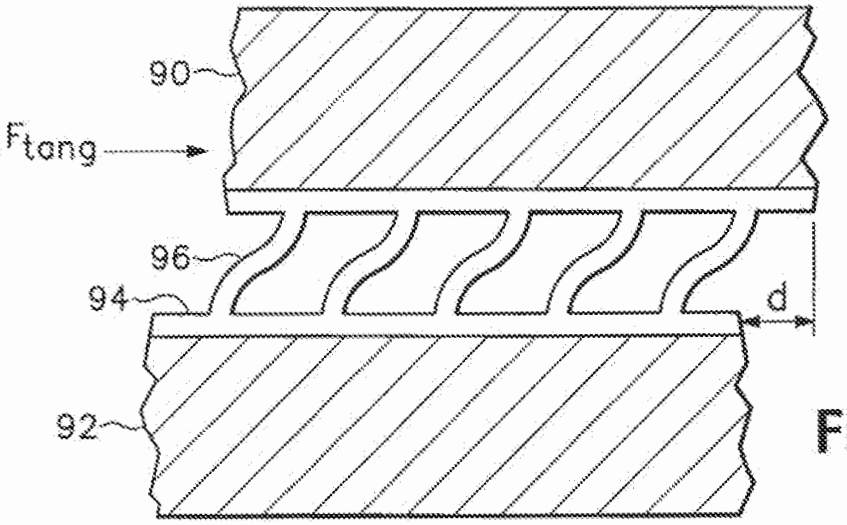


Fig.9B

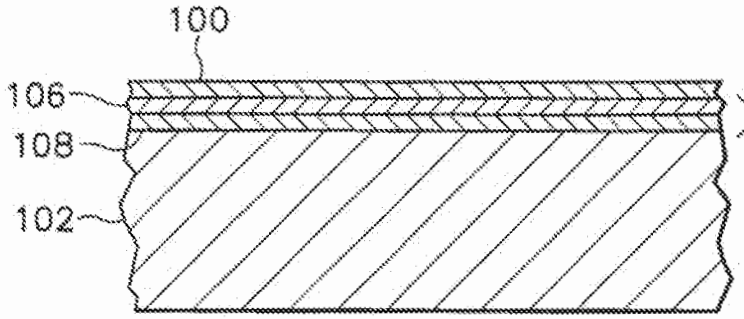


Fig.10A

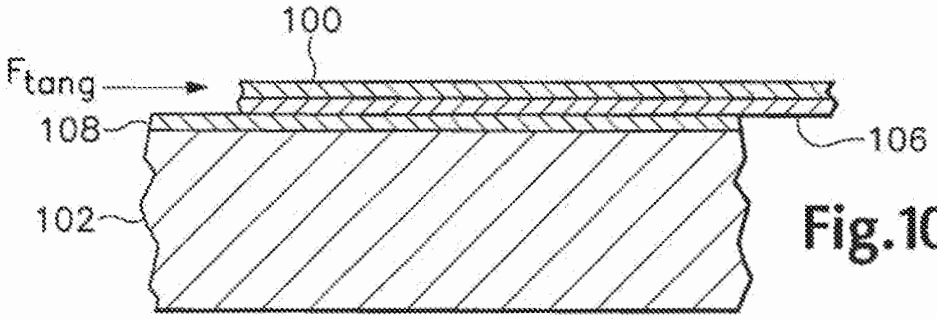


Fig.10B

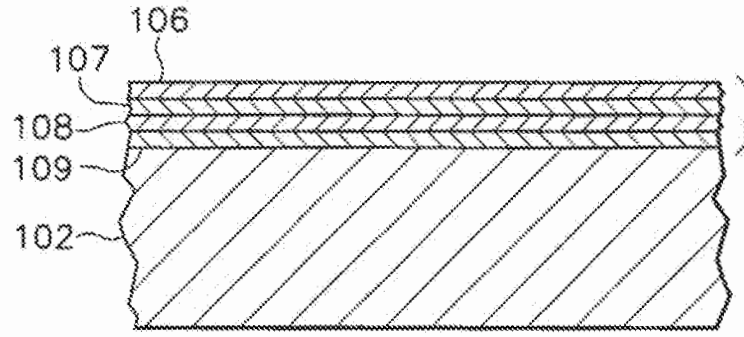


Fig.10C

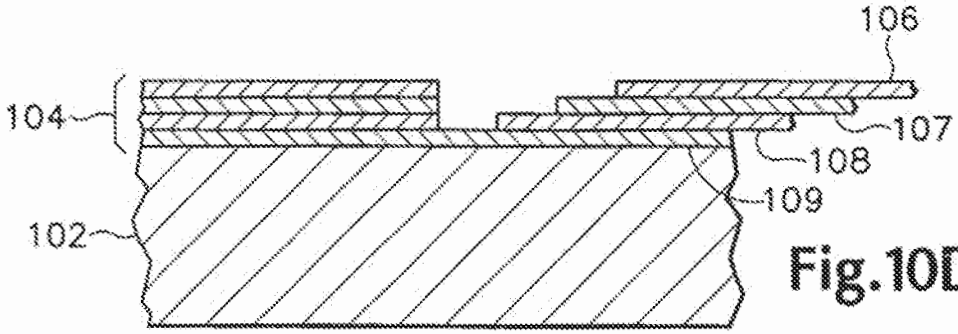


Fig.10D

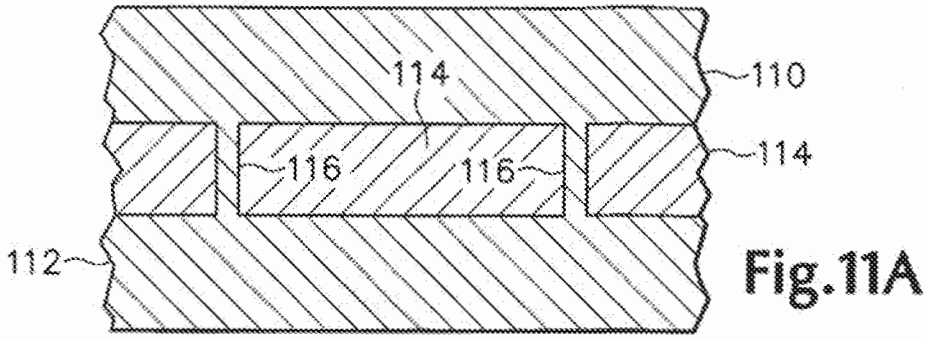


Fig.11A

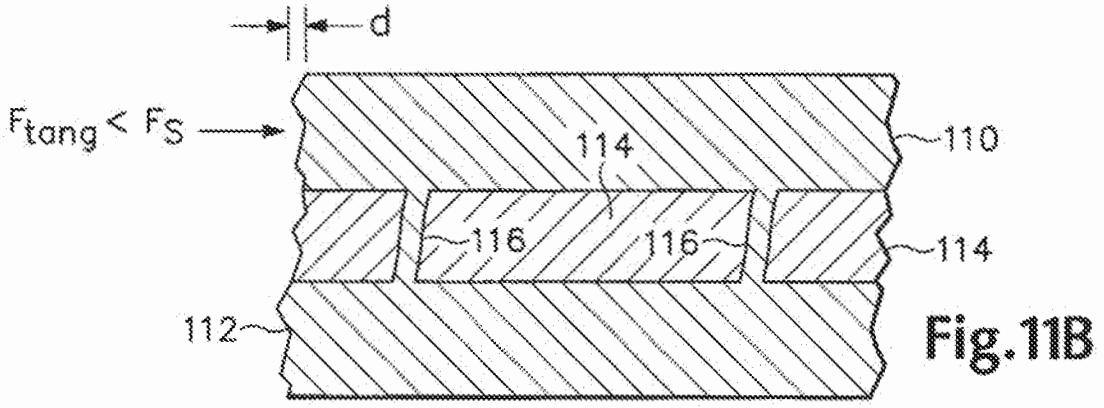


Fig.11B

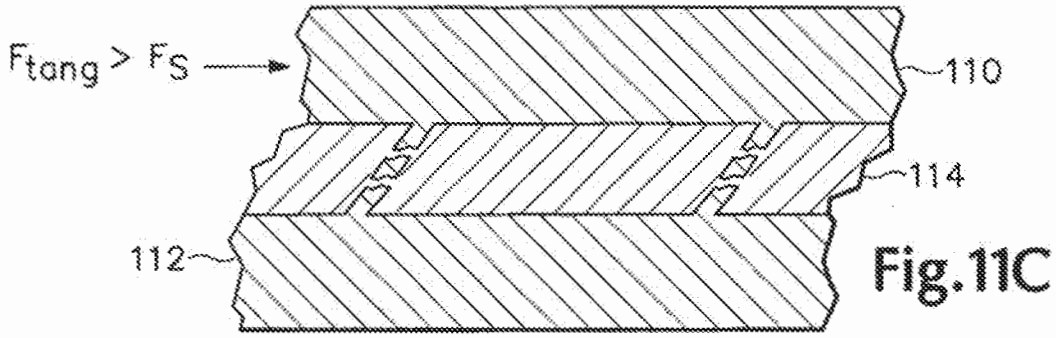


Fig.11C

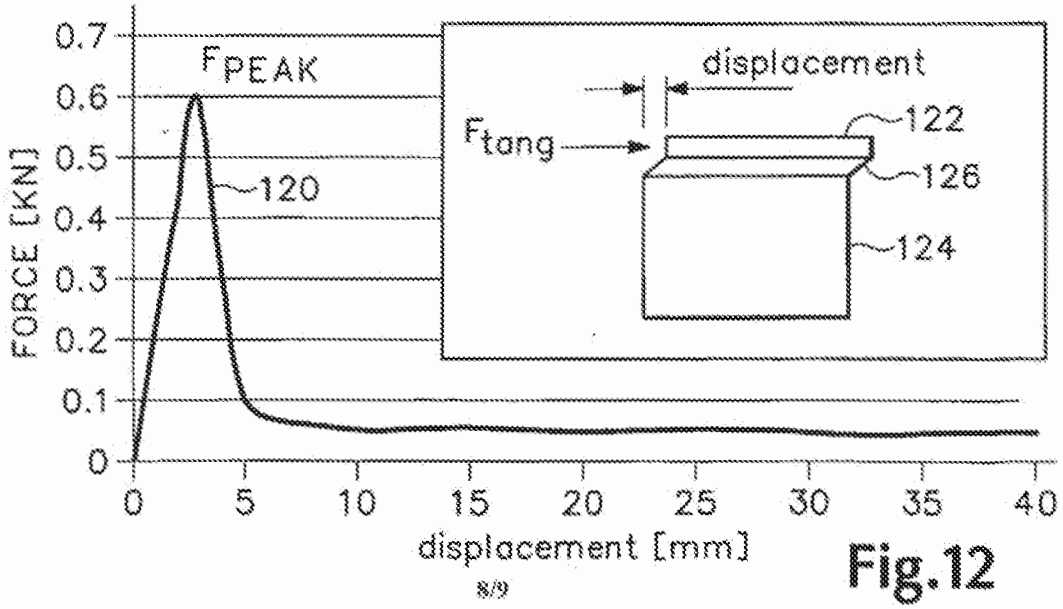


Fig.12

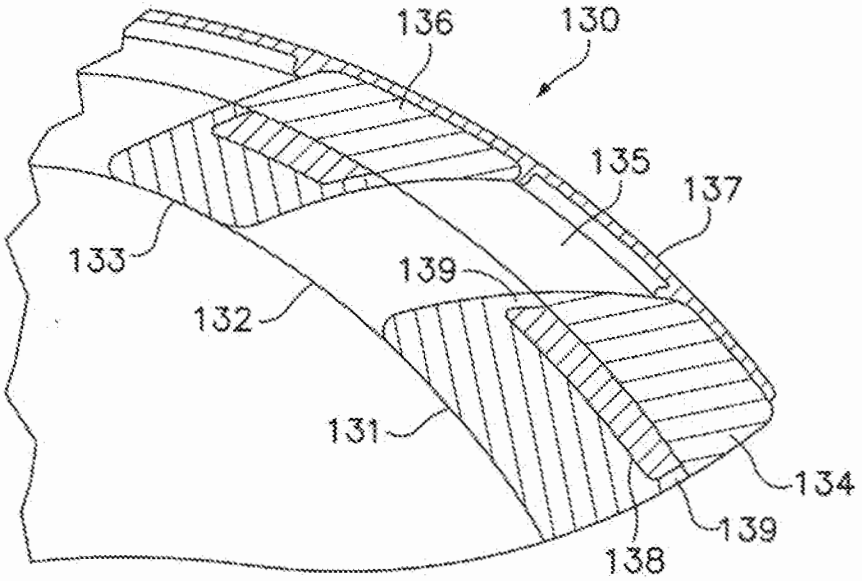

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Fig.13

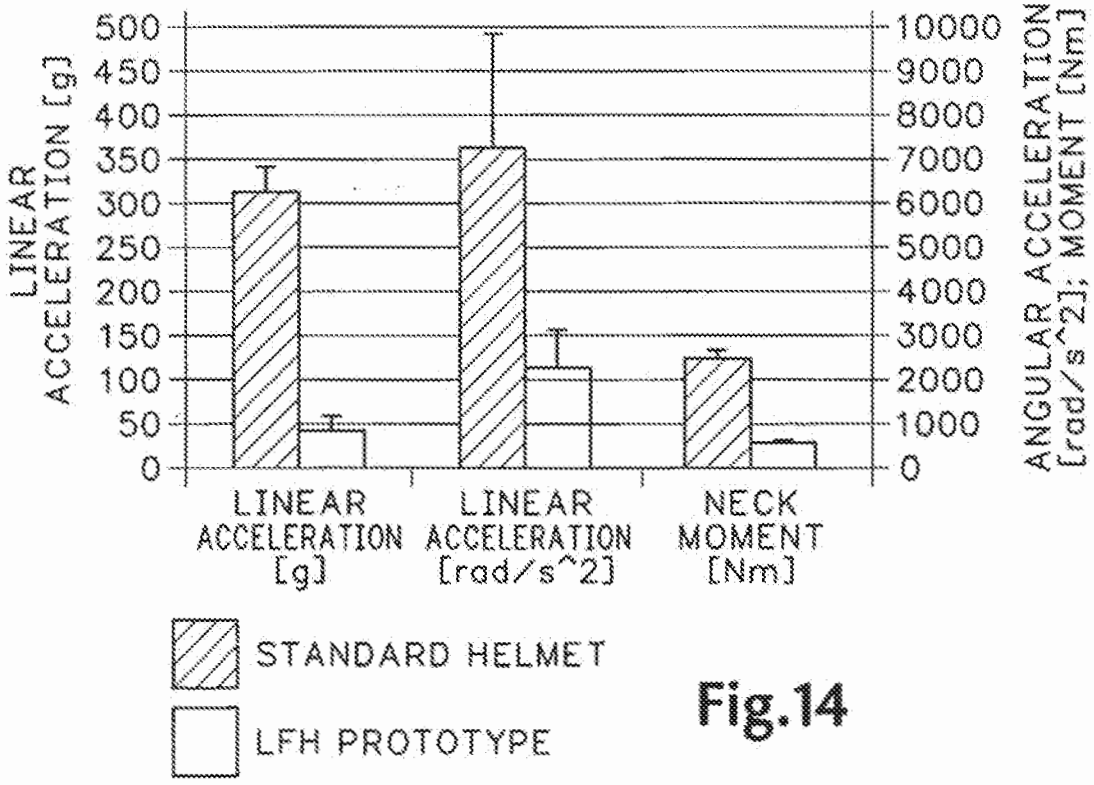

LINEAR ACCELERATION [g]
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7000
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5000
4000
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1000
0
ANGULAR ACCELERATION [rad/s^2]; MOMENT [Nm]
LINEAR ACCELERATION [g]
LINEAR ACCELERATION [rad/s^2]
NECK MOMENT [Nm]
STANDARD HELMET
LFH PROTOTYPE

Fig.14

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/31407

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A42B3/12 A42B3/06

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A42B

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 142 495 A (HONDA GIKEN KOGYO KABUSHIKI KAISHA) 10 October 2001 (2001-10-10) column 1, line 25 - column 2, line 9 column 2, line 41 - column 3, line 32 column 4, line 55 - column 5, line 16 column 5, line 37 - line 50 claims 2-4; figures 1,2,7,8 -/--	1-9, 14-18, 22,23, 30,31, 33-35

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 March 2004	23/03/2004

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax. (+31-70) 340-3016	Bourseau, A-M

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/31407

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/45526 A (H. VON HOLST ; P. HALLDIN) 28 June 2001 (2001-06-28) page 2, line 30 - page 3, line 11 page 4, line 10 - page 6, line 16 page 7, line 26 - page 8, line 18 claims 1,4-10; figures 1-3c,8,9	1-8,12, 14, 19-22, 24-40
A	WO 96/14768 A (K. D. PHILLIPS) 23 May 1996 (1996-05-23) page 1, line 1 - line 4 page 2, last paragraph page 3, paragraph 1 - page 4, paragraph 4 page 5, last paragraph page 6, paragraph 1 - paragraph 2 claims 1,11-18,23,24	1,4
A	FR 2 222 034 A (ROYAL INDUSTRIES, INC.) 18 October 1974 (1974-10-18) page 5, line 19 - line 22 page 7, line 10 - line 17 claim 3; figures 1-3	1
P,A	WO 03/005844 A (PHILLIPS HELMETS LIMITED) 23 January 2003 (2003-01-23) abstract; claims 1-55,58,59; figures 3-10b	1-8,12, 13,24, 30-40

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 03/31407

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	AN ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Avery Audrey Kwan/Amber Lundy
Attorney Docket Number:	BRGDP002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

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Utility filing Fee (Electronic filing)	4011	1	95	95
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
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:				
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Electronic Acknowledgement Receipt

EFS ID:	13303128
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	AN ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Avery Audrey Kwan/Amber Lundy
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		BRGDP002_Application_filed_07-20-12.pdf	462034 aae412107247b5286c0c79d3da7e9c2104583759	yes	34

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Application Data Sheet	1	3
	Specification	4	21
	Claims	22	23
	Abstract	24	24
	Drawings-only black and white line drawings	25	30
	Transmittal Letter	31	32
	Information Disclosure Statement (IDS) Form (SB08)	33	34

Warnings:					
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2	Oath or Declaration filed	BRGDP002_DEC_signed.pdf	447990 f01e0f4dcfc364b0efae3cd98bd4d4ec233d8340	no	2
Warnings:					
Information:					
3	Foreign Reference	WO2004032659_.pdf	5110342 d4f3e06c0ad7dc5863863c8cf38ae3faeb531353	no	36
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4	Non Patent Literature	Helmet_fluid_layer_.pdf	288825 dba282596a2b779145722ab7cec4d5ac8e16b480	no	2
Warnings:					
Information:					
5	Non Patent Literature	Goel_Design_.pdf	221523 95d34fd67ab3282b2ff83de11a6f5e98b24d8f4d	no	8
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8	Non Patent Literature	Bosch_Crash_.pdf	3631403 8a0b3c97b541b0e845f1518cb5d03bef0f772cfa	no	179
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10	Non Patent Literature	Lazer_Helmets_1.pdf	24027337 a5ec5d431bc6a6173e1f2581729fa3cee615cffe	no	54
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11	Non Patent Literature	May_woodpecker_.pdf	1457720 23359f31370cbccf018bf518ef9ae9573bec7bcc	no	4
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13	Fee Worksheet (SB06)	fee-info.pdf	33051 b5b594a7fe9f3ab97629a28d0de8e58a0212a850	no	2
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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.

PTO/SB/14 (11-08)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP002
	Application Number	
Title of Invention	AN ENERGY AND IMPACT TRANSFORMER LAYER	

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

Secrecy Order 37 CFR 5.2

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

Applicant Information:

Applicant 1

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert	T	Knight	

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

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Citizenship under 37 CFR 1.41(b) US

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Address 2			
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Postal Code	94530	Country	US

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

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	19694		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	AN ENERGY AND IMPACT TRANSFORMER LAYER		
Attorney Docket Number	BRGDP002	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	6	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP002
	Application Number	
Title of Invention	AN ENERGY AND IMPACT TRANSFORMER LAYER	

Publication Information:

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

Representative Information:

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

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	19694		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Herewith	non provisional of	61510401	2011-07-21

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

			Remove
Application Number	Country	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1

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Approved for use through 01/31/2014. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BRGDP002
	Application Number	
Title of Invention	AN ENERGY AND IMPACT TRANSFORMER LAYER	

If the Assignee is an Organization check here. ☐				
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country	US	Postal Code	
Phone Number		Fax Number	
Email Address			

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

Signature:

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

Signature	/Audrey Kwan/			Date (YYYY-MM-DD)	2012-07-20
First Name	Avery Audrey	Last Name	Kwan	Registration Number	46850

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.**

AN ENERGY AND IMPACT TRANSFORMER LAYER

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AN ENERGY AND IMPACT TRANSFORMER LAYER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application 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), the entirety of which is incorporated herein by reference for all purposes.

TECHNICAL FIELD

[0002] The present disclosure relates to an energy and impact transformer layer.

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 and energy and impact transformer layers between protective gear shell layers.

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 such as a helmet includes multiple shell layers connected through energy and impact transformer layers. The energy and impact transformer layers may include conical structures used to dissipate mechanical energy applied to an outer shell layer while allowing an outer shell layer the ability to rotate with respect to a middle or inner shell layer. The conical structures may be three dimensional pyramids, three dimensional parabolic structures, and may be outwardly or inwardly oriented.

[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. A helmet, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

2. The helmet of claim 1, wherein an inner energy and impact transformer layer connects the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

3. The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. The helmet of claim 1, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

5. The helmet of claim 1, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

6. The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. The helmet of claim 1, wherein mechanical forces include impact forces.

9. The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. The helmet of claim 10, wherein the lining layer comprises foam.

12. Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. The helmet of claim 12, wherein mechanical forces include impact forces.

20. The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

AN ENERGY AND IMPACT TRANSFORMER LAYER

ABSTRACT OF THE DISCLOSURE

Protective gear such as a helmet includes multiple shell layers connected through energy and impact transformer layers. The energy and impact transformer layers may include conical structures used to dissipate mechanical energy applied to an outer shell layer while allowing an outer shell layer the ability to rotate with respect to a middle or inner shell layer. The conical structures may be three dimensional pyramids, three dimensional parabolic structures, and may be outwardly or inwardly oriented.

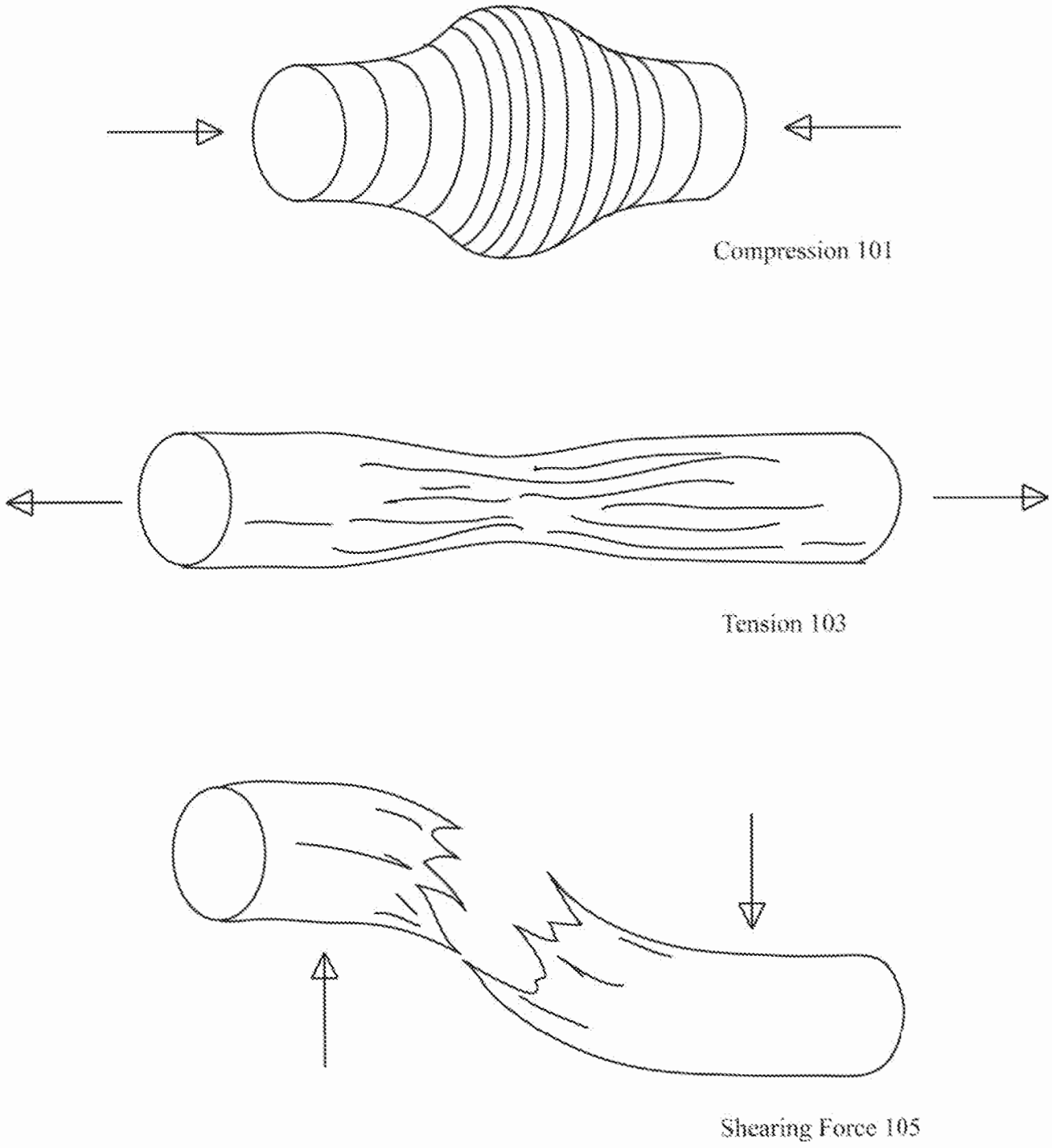


Figure 1

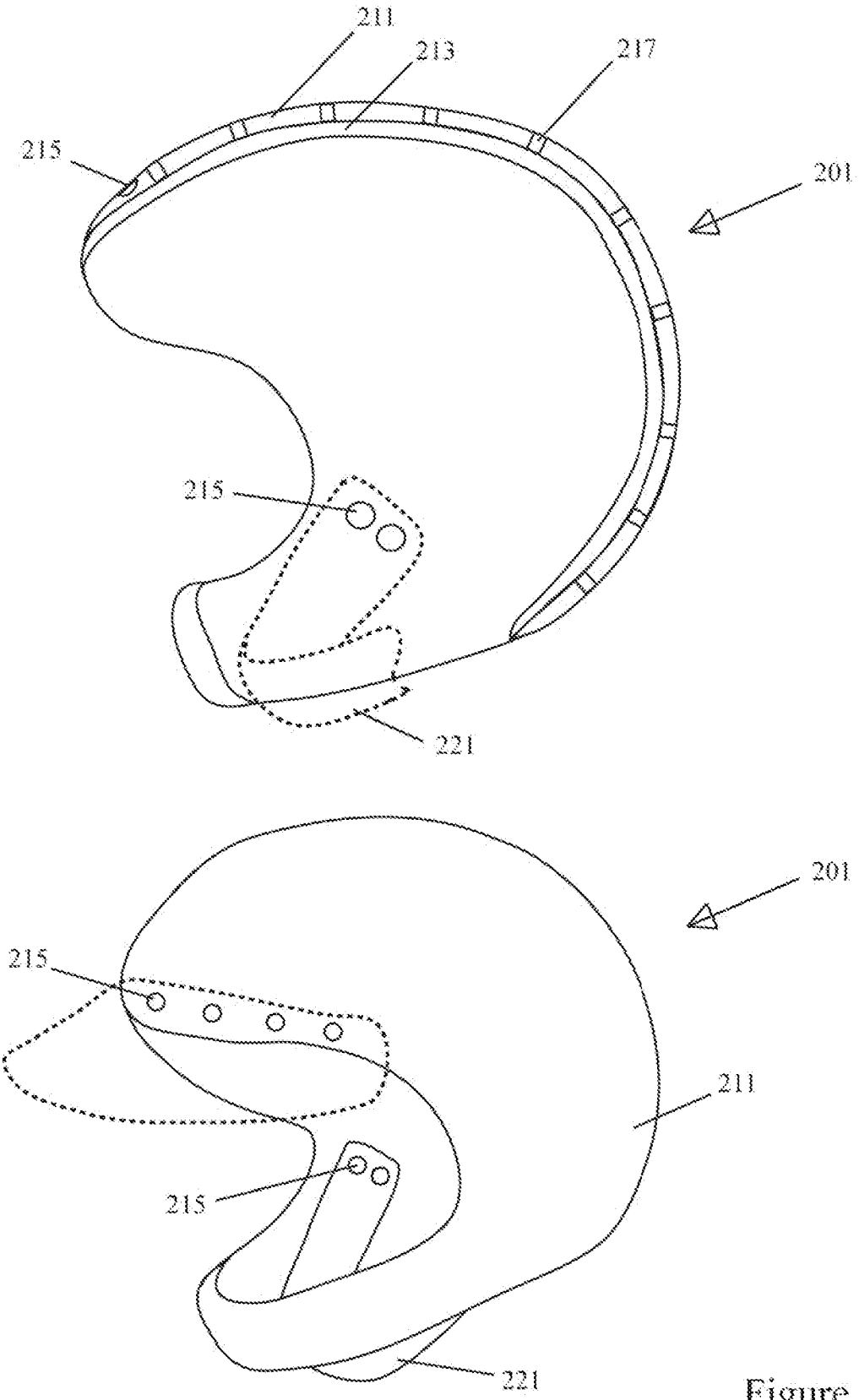


Figure 2

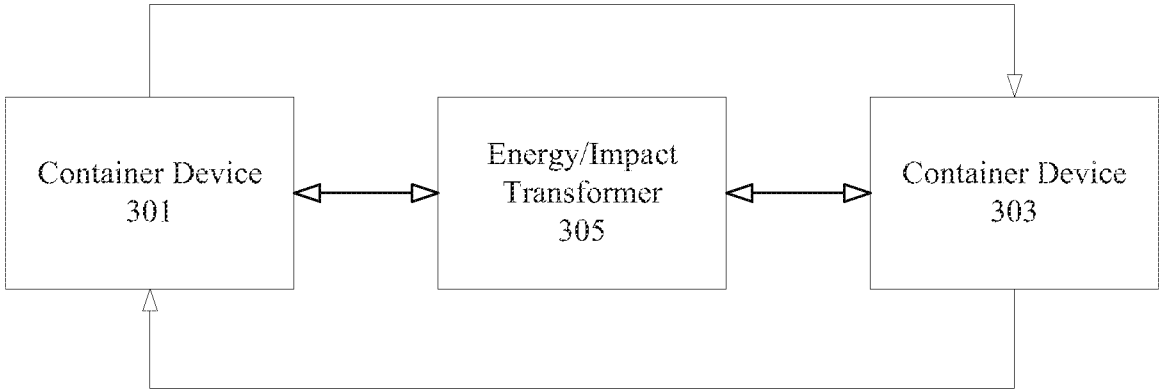

Container Device
301
Energy/Impact
Transformer
305
Container Device
303

Figure 3

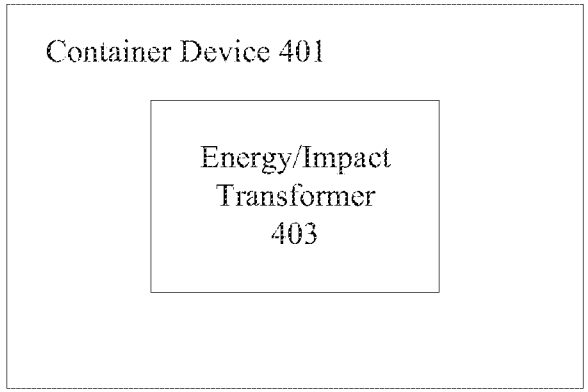


Figure 4

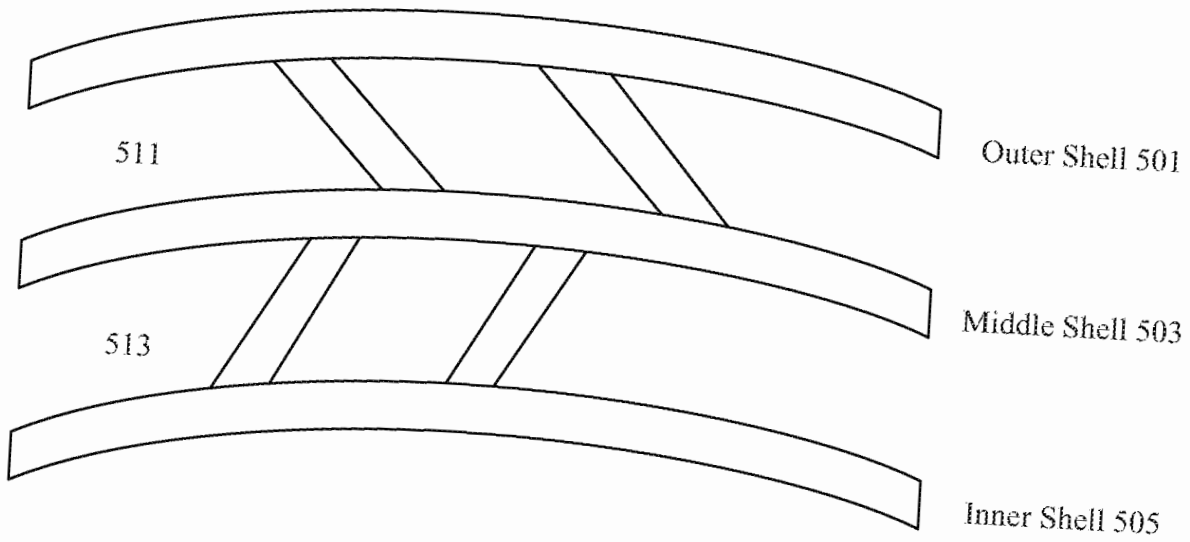


Figure 5

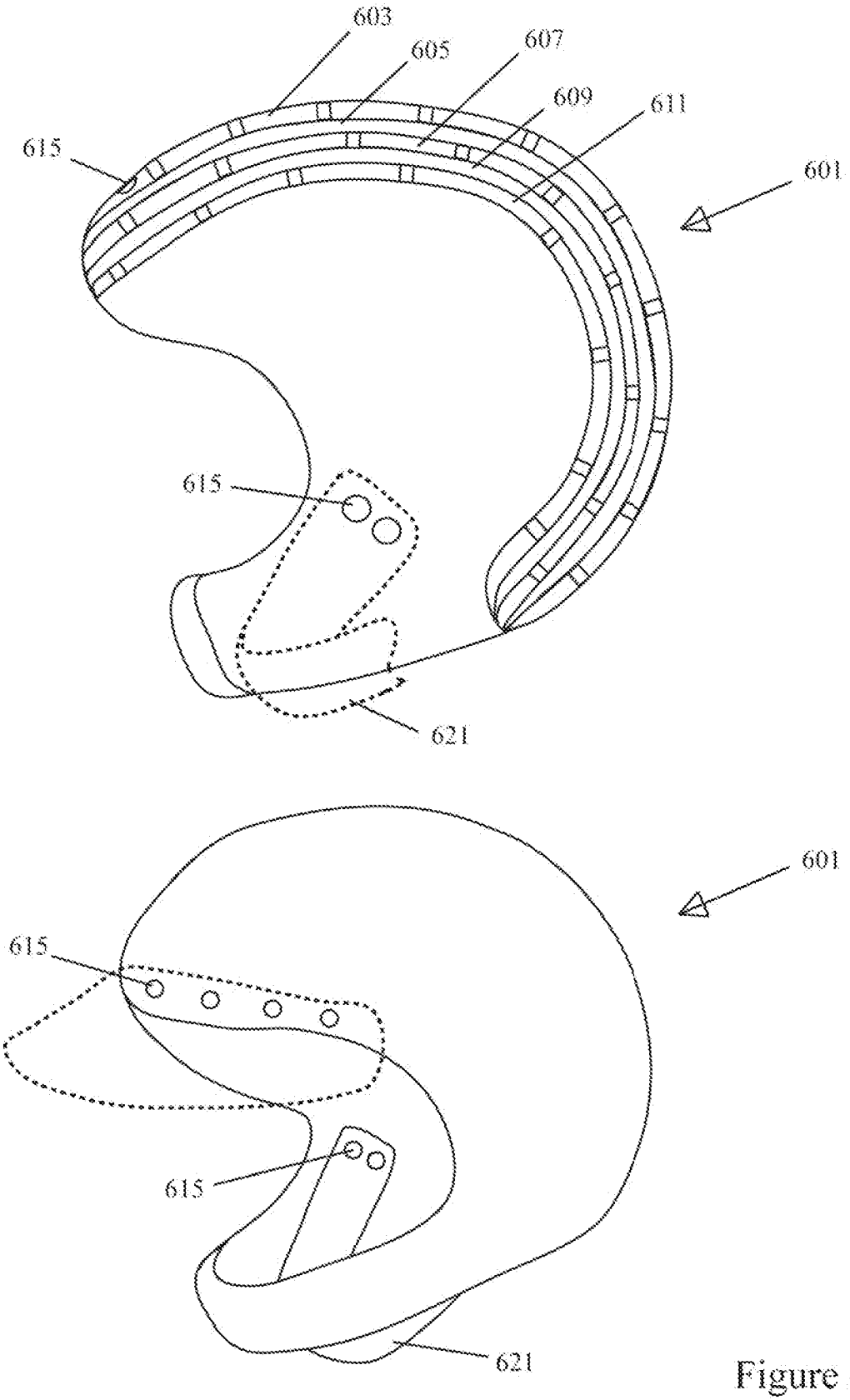


Figure 6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: Unknown	Examiner: Unknown
Filed: Herewith	Group: Unknown
TITLE: AN ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: Unknown

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 July 20, 2012.

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 reference(s) identified in the attached PTO Form 1449 (copies of non-U.S. references are attached) may be material to examination of the above-identified patent application. Applicants identify the reference(s) in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make the identified reference(s) of official record in this application.

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 50-5612.

Respectfully submitted,
Kwan & Olynick LLP

/ Audrey Kwan /

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/554,563

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	95		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	310		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 30 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 125 =	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	530		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 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	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	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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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
13/554,563	07/20/2012	3765	530	BRGDP002	20	2

CONFIRMATION NO. 9273

19694
Kwan & Olynick LLP
1300 Clay St, Suite 600
Oakland, CA 94612

FILING RECEIPT

OC00000055703640

Date Mailed: 08/02/2012

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**

Applicant(s)

Robert T. Knight, El Cerrito, CA;

Assignment For Published Patent Application

Brainguard Technologies, Inc.

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

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/510,401 07/21/2011

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 07/31/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/554,563**

Projected Publication Date: 01/24/2013

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****

Title

ENERGY AND IMPACT TRANSFORMER LAYER

Preliminary Class

002

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

NOT GRANTED

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

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage, facilitate, and accelerate 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Robert T. Knight	Examiner: Unknown
Serial No.:	13/554,563	Group Art Unit: 3765
Filed:	July 20, 2012	Docket: BRGDP002
		Confirmation No.: 9273
Title:	AN ENERGY AND IMPACT TRANSFORMER LAYER	

COMMUNICATION RE: INCORRECT FILING RECEIPT

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

Applicants hereby request correction of the Filing Receipt with respect to the above-identified patent application. In the Filing Receipt mailed August 2, 2012, the title is missing the first word - "An" - and should read "AN ENERGY AND IMPACT TRANSFORMER LAYER", as evidenced in the application as filed on July 20, 2012.

Applicants respectfully request that the above-identified printing error(s) be corrected and that a Corrected Filing Receipt be sent to Applicants' representatives at the address given below.

Respectfully submitted,

Kwan & Olynick LLP
1300 Clay Street, Ste. 600
Oakland, CA 94612
(408) 883-5025

Date August 2, 2012 By /Audrey Kwan/
Avery Audrey Kwan
AK:al Reg. No. 46,850

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 2nd day of August, 2012.

Amber Lundy /Amber Lundy/
Name Signature

Electronic Acknowledgement Receipt

EFS ID:	13403152
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
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:	BRGDP002
Receipt Date:	02-AUG-2012
Filing Date:	20-JUL-2012
Time Stamp:	14:09:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Corrected Filing Receipt	BRGDP002_Request_Correct_FR_08-02-12.pdf	25516 a2f94642d8bfbf445fa2d6e74a4058c9aa985c54	no	1

Warnings:	
Information:	

Total Files Size (in bytes):	25516

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/554,563	07/20/2012	Robert T. Knight	BRGDP002

CONFIRMATION NO. 9273

IMPROPER CFR REQUEST

19694
Kwan & Olynick LLP
1300 Clay St, Suite 600
Oakland, CA 94612

OC000000055829305

Date Mailed: 08/10/2012

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Power of Attorney, Claims, Fees, System Limitations, and Miscellaneous

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

- The articles such as "a", "an", and "the" are not included as the first words in the title of an application. They are considered to be unnecessary to the understanding of the title.

/ktesfaye/

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

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
US Patent & Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	13/554,563
Filing Date	July 20, 2012
First Named Inventor	Knight, Robert
Art Unit	3765
Examiner Name	Unknown

Sheet	1	of	1	Attorney Docket No: BRGDP002

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		6658671	12/9/2003	Von Holst, et al.	6/20/2002

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T^2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	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^2

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Electronic Acknowledgement Receipt

EFS ID:	14712109
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
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:	BRGDP002
Receipt Date:	16-JAN-2013
Filing Date:	20-JUL-2012
Time Stamp:	12:19:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_IDS_filed_01-16-13.pdf	185257 da84fe5443de5b5f1b77fd82bcda92efdde7096f	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			
	Total Files Size (in bytes):	185257	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Unknown
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 January 16, 2013.
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 reference(s) identified in the attached PTO Form 1449 (copies of non-U.S. references are attached) may be material to examination of the above-identified patent application. Applicants identify the reference(s) in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make the identified reference(s) of official record in this application.

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 50-5612.

Respectfully submitted,
Kwan & Olynick LLP

/ Audrey Kwan /

Avery Audrey Kwan
Registration No. 46,850

1300 Clay Street, Ste. 600
Oakland, CA 94612
(408) 883-5025

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/554,563	07/20/2012	Robert T. Knight	BRGDP002

CONFIRMATION NO. 9273

PUBLICATION NOTICE

19694
Kwan & Olynick LLP
1300 Clay St, Suite 600
Oakland, CA 94612

OC000000058840502

Title:ENERGY AND IMPACT TRANSFORMER LAYER

Publication No.US-2013-0019385-A1
Publication Date:01/24/2013

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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 07/08/2015

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

EXAMINER	
HOEY, ALISSA L	

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
07/08/2015	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. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner ALISSA L. HOEY	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 2 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 *07/20/12*.

☐ 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) _____ is/are rejected.

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

9)☒ Claim(s) *1-20* 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 _____ 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

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

Election/Restrictions

2. This application contains claims directed to the following patentably distinct species:

I) Claims 1-11: energy and impact layer between the outer shell and the middle layer.

II) Claims 12-20: energy and impact layer between the inner shell and middle layer.

The species are independent or distinct because the different species claim different structure. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic to both species.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

- *the species or groupings of patentably indistinct species have acquired a separate status in the art in view of their different classification*

- *the species or groupings of patentably indistinct species require a different field of search (e.g., searching different classes /subclasses or electronic resources, or employing different search strategies or search queries).*

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the

evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Sub-Species

3. Claim(s) 1 or 12 is/are generic to the following disclosed patentably distinct species:

If group I or II is elected from above, then a further election is required between the following:

A) The first plurality of conical structures are:

a) Claims 3 or 14: oriented outwardly

b) Claims 5 or 16: oriented inwardly

B) The second plurality of conical structures:

a) Claims 4 or 15: oriented outwardly

b) Claims 6 or 17: oriented inwardly

The species are independent or distinct because as disclosed the different species have mutually exclusive characteristics for each identified species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

- *the species or groupings of patentably indistinct species have acquired a separate status in the art in view of their different classification*
- *the species or groupings of patentably indistinct species require a different field of search (e.g., searching different classes /subclasses or electronic resources, or employing different search strategies or search queries).*

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species** or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after

the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISSA L. HOEY whose telephone number is (571)272-4985. The examiner can normally be reached on M-F (9:00-6:30)Second Friday Off.

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 the organization where this application or proceeding is assigned is 571-273-8300.

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

/ALISSA L HOEY/
Primary Examiner, Art Unit 3765

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 September 8, 2015.
Signed: _____/Amber Lundy/_____
Amber Lundy

RESPONSE TO RESTRICTION REQUIREMENT

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

In response to the Restriction Requirement dated July 8, 2015, Applicant hereby elects, without traverse, species I, Claims 1-11, to prosecute in the above-identified patent application.

If the Examiner has any questions or concerns for the Applicant, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Audrey Kwan/
Avery Audrey Kwan
Reg. 46,850

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Electronic Acknowledgement Receipt

EFS ID:	23428099
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
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:	BRGDP002
Receipt Date:	08-SEP-2015
Filing Date:	20-JUL-2012
Time Stamp:	15:56:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	BRGDP002_Response_RR_filed_09-08-15.pdf	68077 fbe9d6d3e210f1f36f3919f8cec030f1b278ead6	no	1

Warnings:	
Information:	

Total Files Size (in bytes):	68077

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 09/22/2015

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

EXAMINER	
HOEY, ALISSA L	

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
09/22/2015	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

Notice of Non-Compliant Amendment (37 CFR 1.121)	Application No. 13/554,563	Applicant(s) KNIGHT, ROBERT T.
	Examiner ALISSA L. HOEY	Art Unit 3765

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

The amendment document filed on *08 September 2015* is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
  - ☐ A. Amended paragraph(s) do not include markings.
  - ☐ B. New paragraph(s) should not be underlined.
  - ☐ C. Other _____.
- ☐ 2. Abstract:
  - ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
  - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
  - ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
  - ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
  - ☐ C. Other _____.
- ☐ 4. Amendments to the claims:
  - ☐ A. A complete listing of all of the claims is not present.
  - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
  - ☐ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
  - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
  - ☐ E. Other: _____.
- ☒ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):
  The election of species requriement on page 4 was not addressed. Please select one from group A and one from group B.

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment or an amendment filed after allowance. If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.
2. Applicant is given **two months** from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a *Quayle* action. If any of above boxes 1. to 4. are checked, the correction required is only the **corrected section** of the non-compliant amendment in compliance with 37 CFR 1.121.

   Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.

   Failure to timely respond to this notice will result in:
   Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or
   Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

/ALISSA L HOEY/
Primary Examiner, Art Unit 3765

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 October 6, 2015.

Signed: _____/Amber Lundy/_____
Amber Lundy

SUPPLEMENTAL RESPONSE TO RESTRICTION REQUIREMENT

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

In response to the Restriction Requirement dated July 8, 2015, Applicant hereby elects, without traverse, species I, Claims 1-11, to prosecute in the above-identified patent application.

Furthermore, Applicant elects species A(b) corresponding to dependent claim 5 and B(a) corresponding to dependent claim 4. Claim 1 is believed to represent a generic species. The claims shall be restricted to this species if no generic claim is finally held to be allowable. The remaining dependent claims can be associated with this species.

If the Examiner has any questions or concerns for the Applicant, the Examiner is encouraged to contact the Undersigned using the information provided below.

Please charge any fees or credit any overpayment to Deposit Account 50-6367 (BRGDP002).

Respectfully submitted,

/Audrey Kwan/

Avery Audrey Kwan
Reg. 46,850

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94702
(510) 900-9501 x705
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Electronic Acknowledgement Receipt

EFS ID:	23711136
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
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:	BRGDP002
Receipt Date:	06-OCT-2015
Filing Date:	20-JUL-2012
Time Stamp:	20:16:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	BRGDP002_SuppResponse_RR_filed_10-06-15.pdf	96268 369d3d1466504c18e8c9a9c2f2ca161dd6b1760e	no	2

Warnings:	
Information:	

Total Files Size (in bytes):	96268

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 10/20/2015

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

EXAMINER
HOEY, ALISSA L

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
10/20/2015	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. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner ALISSA L. HOEY	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 *10/06/15*.

☐ 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) *3,6 and 12-20* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,2,4,5 and 7-11* 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 *07/21/11* 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 *1/16/13; 07/20/12*.

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

4) ☐ Other: _____.

DETAILED ACTION

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

Election/Restrictions

2. Claims 3, 6 and 12-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention/embodiment, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/06/15.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the conical structures of claims 1-11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer” and “the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell" of claims 4 and 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 4 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. It is unclear what "the second plurality of conical structures" is referring to, there is no antecedent basis for this structure in independent claim 1, from which claim 4 depends.

7. Claims 4 and 5 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. It is unclear what “with bases” is referring to, is this a base of the conical structure?

Double Patenting

8. 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. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for

applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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.

9. Claims 1, 5, 8, 9, 10 and 11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 9,095,179 in view of Ferrara (US 2006/0059606). The patent teaches a helmet with and impact transformer layer between an outer and middle shell with an interior lining (see claims 1-10 of US 9,905,179). Ferrara teaches an impact transformer layer having conical structures (see figures 4-10; paragraph 0068). It would have been obvious to have provided the impact transformer layer of '179 with the conical structures as taught by Ferrara, since the impact transformer layer of '179 provided with conical structures would provide a layer with good compression and movement between the outer layer and the middle layer.

10. Claims 1, 5, 7, 8 and 9 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 9,060,561 in view

of Ferrara (US 2006/0059606). The patent teaches a helmet with and impact transformer layer between an outer and middle shell with an interior lining (see claims 1-20 of US 9,060,561). Ferrara teaches an impact transformer layer having conical structures (see figures 4-10; paragraph 0068). It would have been obvious to have provided the impact transformer layer of '561 with the conical structures as taught by Ferrara, since the impact transformer layer of '561 provided with conical structures would provide a layer with good compression and movement between the outer layer and the middle layer.

11. Claims 1, 2, 5, 7, 8, 9 10 and 11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319 in view of Ferrara (US 2006/0059606). The patent teaches a helmet with and impact transformer layers between an outer and outer shell, middle shell and interior lining (see claims 1-20 of US 8,863,319). Ferrara teaches an impact transformer layer having conical structures (see figures 4-10; paragraph 0068). It would have been obvious to have provided the impact transformer layers of '319 with the conical structures as taught by Ferrara, since the impact transformer layers of '319 provided with conical structures would provide layers with good compression and movement between the outer layer middle and inner layers.

Claim Rejections - 35 USC § 102

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

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 2, 4, 5, 8 and 9 are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Larry (US 4,213,202).

Larry teaches the following:

1. A helmet, comprising: an outer shell layer (12); a middle shell layer (13) an inner shell layer (14); and an outer energy and impact transformer layer (upper: 16, 16, 16) connecting the outer shell layer (12) to the middle shell layer (13), wherein the outer energy and impact transformer layer (upper: 16, 16, 16) comprises a first plurality of conical structures (16, 16, 16) configured to absorb energy from mechanical forces imparted onto the outer shell layer (see figures 1 and 2), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer (figures 1 and 2: sufficient structure, capable of performing).

2. The helmet of claim 1, wherein an inner energy and impact transformer layer (lower: 16, 16, 16) connects the middle shell layer (13) to the inner shell layer (14), wherein the inner energy and impact transformer layer comprises a second plurality of conical structures (16, 16, 16) configured to absorb energy from mechanical forces imparted onto the middle shell layer (figures 1 and 2), wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer (figures 1 and 2: sufficient structure, capable of performing).

4. The helmet of claim 1, wherein the second plurality of conical structures (16, 16, 16) are oriented outwardly, with bases situated on the inner shell layer (see figure 1).

5. The helmet of claim 1, wherein the first plurality of conical structures (16, 16, 16) are oriented inwardly, with bases situated on the outer shell layer (see figure 1).

8. The helmet of claim 1, wherein mechanical forces include impact forces (see figures 1 and 2).

9. The helmet of claim 1, wherein mechanical forces include rotational and shear forces (see figures 1 and 2: capable of performing, sufficient structure).

14. Claims 1, 2, 4, 5, 8, 9 and 10 are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Nichols (US 3,872,511).

Nichols teaches the following:

1. A helmet, comprising: an outer shell layer (32); a middle shell layer (31) an inner shell layer (12); and an outer energy and impact transformer layer (33) connecting the outer shell layer (32) to the middle shell layer (31)(Fig. 6), wherein the outer energy and impact transformer layer (33) comprises a first plurality of conical structures (38) configured to absorb energy from mechanical forces imparted onto the outer shell layer (see figures 7 and 8)(column 3, lines 53-61 through column 4, lines 1-6), wherein the outer energy and impact transformer layer (33) allows the outer shell layer to rotate relative to the middle shell layer (Figs. 7 and 8).

2. The helmet of claim 1, wherein an inner energy and impact transformer layer (14) connects the middle shell layer (35) to the inner shell layer (12)(Figs. 6-8), wherein

the inner energy and impact transformer layer (35) comprises a second plurality of conical structures (35, 35, 35, 35) configured to absorb energy from mechanical forces imparted onto the middle shell layer (Figs. 6-8)(column 3, lines 53-61 through column 4, lines 1-6), wherein the inner energy and impact transformer layer (35) allows the middle shell layer to rotate relative to the inner shell layer (column 3, lines 53-61 through column 4, lines 1-6).

4. The helmet of claim 1, wherein the second plurality of conical structures (35, 35, 35) are oriented outwardly, with bases situated on the inner shell layer (Figs. 6-8).

5. The helmet of claim 1, wherein the first plurality of conical structures (38, 38, 38) are oriented inwardly, with bases situated on the outer shell layer (Fig. 8).

8. The helmet of claim 1, wherein mechanical forces include impact forces (Figs. 7 and 8).

9. The helmet of claim 1, wherein mechanical forces include rotational and shear forces (Figs. 7 and 8)(column 3, lines 53-61 through column 4, lines 1-6).

10. The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head (see figures 6-8: inner layer would be 35 and inner lining would be 12).

15. Claims 1, 5, 8 and 9 are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2007/0190293).

Ferrara teaches the following:

1. A helmet, comprising: an outer shell layer (242); a middle shell layer (244) an inner shell layer (224); and an outer energy and impact transformer layer (246)

connecting the outer shell layer (242) to the middle shell layer (244), wherein the outer energy and impact transformer layer (246) comprises a first plurality of conical structures (222, 222, 222) configured to absorb energy from mechanical forces imparted onto the outer shell layer (Fig. 19)(paragraphs 0101, 0102), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer (Fig. 19)(paragraphs 0101, 0102).

5. The helmet of claim 1, wherein the first plurality of conical structures (222, 222, 222) are oriented inwardly, with bases situated on the outer shell layer (242)(Fig. 19).

8. The helmet of claim 1, wherein mechanical forces include impact forces (paragraphs 0101, 0102).

9. The helmet of claim 1, wherein mechanical forces include rotational and shear forces (paragraph 0101, 0102: sufficient structure, capable of performing as desired).

16. Claims 1, 5, 8 and 9 are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2006/0059606).

Ferrara teaches the following:

1. A helmet, comprising: an outer shell layer (20'); a middle shell layer (28') an inner shell layer (32'); and an outer energy and impact transformer layer (24') connecting the outer shell layer (20') to the middle shell layer (32'), wherein the outer energy and impact transformer layer (24') comprises a first plurality of conical structures (50', 50') configured to absorb energy from mechanical forces imparted onto the outer shell layer (see figures 7-8), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer (figures 7A, 7B).

5. The helmet of claim 1, wherein the first plurality of conical structures (50', 50', 50') are oriented inwardly, with bases situated on the outer shell layer (figures 7 and 8).

8. The helmet of claim 1, wherein mechanical forces include impact forces (figure 7A).

9. The helmet of claim 1, wherein mechanical forces include rotational and shear forces (figure 7B).

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 2, 3 and 10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ferrara (US 2007/0190293) in view of Nichols (US 3,872,511).

Ferrara teaches a helmet as described above in claim 1. However, Ferrara fails to teach an inner energy and impact transformer layer connects the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

In regard to claim 2, Ferrara teaches an inner energy and impact transformer layer (224) connects the middle shell layer (244), wherein the inner energy and impact transformer layer (224) comprises a second plurality of conical structures (224, 224,

224) configured to absorb energy from mechanical forces imparted onto the middle shell layer (244)(figure 19), wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the user's head (figure 19).

Nichols teaches a helmet structure with an inner layer between the second impact transformer layer and the user's head (Fig. 6, identifier 12).

It would have been obvious to have provided the helmet structure of Ferrara with the inner cushioning layer of Nichols, since the inner cushioning layer provided between the second impact transformer layer of Ferrara and the user's head would provide greater protection and comfort during use.

In regard to claim 4, the inner shell layer (12) of Nichols would allow the second plurality of conical structures of Ferrara to be oriented outwardly, with bases situated on the inner shell layer of Nichols instead of directly on the user's head (see Ferrara: Fig. 19).

It would have been obvious to have provided the helmet structure of Ferrara with the inner cushioning layer of Nichols, since the inner cushioning layer provided between the second impact transformer layer of Ferrara and the user's head would provide greater protection and comfort during use.

In regard to claim 10, when the inner shell of Ferrara is 224, Nichols teaches an inner lining configured to conform to a user's head (Fig. 6, identifier 12).

It would have been obvious to have provided the helmet structure of Ferrara with the inner lining of Nichols, since the inner shell (224) of Ferrara provided with an inner lining would provide greater comfort and protection to the user.

19. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ferrara (US 2007/0190293) in view of Ellis (US 2008/0086916).

Ferrara teaches a helmet as described above in claim 1. However, Ferrara fails to teach the outer energy and impact transformer layer comprises a magneto-rheological element.

In regard to claim 7, Ellis teaches a helmet with an energy and impact transformer layer comprising a magneto-rheological element (Figs. 24A-24D; paragraphs 0017, 0026 and 0098).

It would have been obvious to have provided the helmet of Ferrara with the magneto-rheological element of Ellis, since the helmet of Ferrara provided with a magneto-rheological element in the impact transformer layer would allow for good motion between the inner and outer layer along with additional support and cushioning.

20. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ferrara (US 2007/0190293) in view of Copeland (US 2006/0070170).

Ferrara teaches a helmet as described above in claim 1. However, Ferrara fails to teach a lining layer is connected to the inner shell layer and wherein the lining layer is configured to conform to a human head and wherein the lining layer comprises foam.

In regard to claims 10 and 11, Copeland teaches an inner lining (19) of foam (paragraph 0023) connected to the inner shell to conform to a human head (see figures 3 and 8).

It would have been obvious to have provided the helmet of Ferrara with the inner lining of foam as taught by Copeland, since the helmet of Ferrara provided with an inner lining foam layer would provide additional comfort and protection to the user's head.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and can be found cited in PTO-892 form submitted herewith.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISSA L. HOEY whose telephone number is (571)272-4985. The examiner can normally be reached on M-F (9:00-6:30)Second Friday Off.

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 the organization where this application or proceeding is assigned is 571-273-8300.

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

/ALISSA L HOEY/
Primary Examiner, Art Unit 3765

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Notice of References Cited	Application/Control No. 13/554,563	Applicant(s)/Patent Under Reexamination KNIGHT, ROBERT T.	
	Examiner ALISSA L. HOEY	Art Unit 3765	Page 4 of 4

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	Unknown13/554,563
Filing Date	Herewith
First Named Inventor	Knight, Robert
Art Unit	Unknown3765
Examiner Name	UnknownA. Hoey

Sheet	1	of	2

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	Unknown
Filing Date	Herewith
First Named Inventor	Knight, Robert
Art Unit	Unknown
Examiner Name	Unknown

Sheet	2	of	2	Attorney Docket No: BRGDP002

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	Art Unit
	ALISSA L HOEY	3765

CPC- SEARCHED		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06; A42B3/064	10/15/15	ALH

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US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
2	411, 425, 410	10/15/15	ALH

SEARCH NOTES		
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

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EAST Search History

EAST Search History (Prior Art)

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EAST Search History (Interference)

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	13/554,563
Filing Date	July 20, 2012
First Named Inventor	Knight, Robert
Art Unit	3765
Examiner Name	Unknown

Sheet	1	of	1	Attorney Docket No: BRGDP002

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
/AH/		6658671	12/9/2003	Von Holst, et al.	6/20/2002

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T^2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	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^2

EXAMINER /ALISSA HOEY/ **DATE CONSIDERED** 10/13/2015

Substitute Disclosure Statement Form (PTO-1449)

[1] EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 April 20, 2016.

Signed: _____/Sally Austin/_____
Sally Austin

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Non Final Office Action dated October 20, 2015, a response to which is due April 20, 2016.

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

Remarks/Arguments begin on page 4 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A helmet, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of ~~conical structures~~ thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

2. (Currently Amended) The helmet of claim 1, wherein an inner energy and impact transformer layer connects the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of ~~conical structures~~ thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Currently Amended) The helmet of claim [[1]]2, wherein the second plurality of ~~conical structures~~ thin elastomeric trusses are oriented ~~outwardly, with bases situated on the inner shell layer~~in a different direction than the first plurality of thin elastomeric trusses.

5. (Currently Amended) The helmet of claim 1, wherein ~~the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer~~the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Final Office action mailed September 30, 2015 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected claim 4 under 35 U.S.C. 112 (b) or 35 U.S.C. 112 (pre-AIA, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention;
- rejected claims 4 and 5 under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention;
- rejected the claims over non-statutory double patenting;
- rejected claims 1, 2, 4, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 1, 2, 4, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Nichols (US 3,872,511) (Hereinafter "Nichols");
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2007/0190293) (Hereinafter "Ferrara '293");
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2006/0059606) (Hereinafter "Ferrara '606");
- rejected claims 2, 3 and 10 under 35 U.S.C. 103(a) as being unpatentable Ferrara '293 in view of Nichols;
- rejected claims 7 under 35 U.S.C. 103(a) as being unpatentable Byers in view of Ferrara '293, further in view of Ellis (US Patent Application 2008/0086916) (hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Byers in view of Ferrara '293, further in view of Copeland (US Patent Application 2006/0070170) (hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

Amendments to the Claims

Claim 1 has been amended to recite: "a first plurality of ~~conical structures~~ thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer."

Support for the amendments can be found throughout the specification, for example, at 0057 and Figure 5 of the application as filed.

Claims 2 and 4 have been similarly amended.

Claim 5 has been additionally amended to recite "the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force." Support for the amendments can be found throughout the specification, for example, at 0045 of the application as filed.

112 rejections

In the Office Action, the Examiner rejected claims 4 and 5 under 35 USC 112 for being indefinite. However, Applicants have subsequently amended the claims thereby rendering the rejection moot. Therefore, Applicants respectfully request that the 35 U.S.C. §112 rejections of claims 4 and 5 be withdrawn.

Non-statutory Double Patenting

In the Office Action, the Examiner rejected the claims under non-statutory double patenting over various references. Should it be deemed necessary at the close of prosecution, Applicants will timely file the appropriate terminal disclaimers in order to get an allowance.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 102

In the Office Action, the Examiner rejected the claims under 35 USC 102(b) as being anticipated by Larry, Nichols, Ferrara '293 and Ferrara '606. However, as mentioned above, the claims have been amended to recite: "a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer." Applicants submit that none of the references teaches "elastomeric trusses" in the energy and impact transformer layers. While Larry teaches bellows in between middle layer and outer layer, a bellows is a "device with an air bag that emits a stream of air." (Google definition, "bellows"). Thus, one of ordinary skill in the art would not consider bellows to be the same as "thin elastomeric trusses," as recited in the claims and depicted in Figure 5 of the application as filed. Thus, Applicants submit that Larry, along with

the other 102(b) references, do not teach all elements of the claims. Consequently, the cited references do not anticipate the claims. Therefore, Applicants respectfully request that the 35 U.S.C. §102(b) rejections of the claims be withdrawn.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the dependent claims under 35 USC 103(a) over various references. However, the dependent claims, by virtue of their dependency, incorporate all features of their respective independent claims and are patentable over the cited art for at least the same reasons as given for their respective independent claims. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the dependent claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Joshua W. Chang/

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Reg. 70,831

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Electronic Patent Application Fee Transmittal

Application Number:	13554563
Filing Date:	20-Jul-2012
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Joshua Chang/Sally Austin
Attorney Docket Number:	BRGDP002

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($)
Extension - 3 months with $0 paid	1253	1	1400	1400
Miscellaneous:				
			Total in USD ($)	**1400**

Electronic Acknowledgement Receipt

EFS ID:	25552956
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Sally Austin
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	21-APR-2016
Filing Date:	20-JUL-2012
Time Stamp:	00:40:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1400
RAM confirmation Number	9944
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 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 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		BRGDP002_RESPONSE_filed_042016.pdf	135558 fd83b62c58b176f61579ea1f34f85557fa5ffd01	yes	6

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	3
Applicant Arguments/Remarks Made in an Amendment	4	6

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30661 cff5f44127a3474ad6815614027f1ce938d755a1	no	2

Warnings:

Information:

Total Files Size (in bytes):	166219

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New Applications Under 35 U.S.C. 111

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

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **04/21/2016**

	(Column 1)		(Column 2)	(Column 3)		
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DENISE T. LILES/

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 April 25, 2016.

Signed: _____/Sally Austin/_____
Sally Austin

SUPPLEMENTAL RESPONSE TO OFFICE ACTION

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

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Non Final Office Action dated October 20, 2015, a previous response to which was filed April 20, 2016.

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

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) ~~A helmet~~Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; [[and]]

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of ~~conical structures~~ thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Currently Amended) The helmet of claim 1, wherein ~~the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer~~the outer energy and

impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Final Office action mailed September 30, 2015 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected claim 4 under 35 U.S.C. 112 (b) or 35 U.S.C. 112 (pre-AIA, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention;
- rejected claims 4 and 5 under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention;
- rejected the claims over non-statutory double patenting;
- rejected claims 1, 2, 4, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 1, 2, 4, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Nichols (US 3,872,511) (Hereinafter "Nichols");
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2007/0190293) (Hereinafter "Ferrara '293");
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Ferrara (US 2006/0059606) (Hereinafter "Ferrara '606");
- rejected claims 2, 3 and 10 under 35 U.S.C. 103(a) as being unpatentable Ferrara '293 in view of Nichols;
- rejected claims 7 under 35 U.S.C. 103(a) as being unpatentable Byers in view of Ferrara '293, further in view of Ellis (US Patent Application 2008/0086916) (hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Byers in view of Ferrara '293, further in view of Copeland (US Patent Application 2006/0070170) (hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

Amendments to the Claims

Claim 1 has been amended as presented above. Support for the amendments can be found throughout the specification, for example, at Figure 5 of the application as filed.

Interview Summary

Applicants thank Examiner Alissa Hoey for her comments during a telephonic interview on April 22, 2016 with Applicants' representative. In the interview, the Examiner and Applicants' representative discussed the claims, the previously filed amendments, the amendments presented above, and the prior art references. The Examiner agreed that the amendments presented above were sufficient for overcoming the current rejections. No other agreement has been reached.

REMARKS CONCERNING ALL REJECTIONS

In the Office Action, the Examiner rejected the claims under 35 USC 112, non-statutory double patenting, 35 USC 102(b), and 35 USC 103(a). However, as mentioned above, the Examiner agreed that the amendments presented above are sufficient for overcoming the current rejections. Therefore, Applicants respectfully request that the current rejections of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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

Electronic Acknowledgement Receipt

EFS ID:	25583259
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Sally Austin
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	25-APR-2016
Filing Date:	20-JUL-2012
Time Stamp:	12:27:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_SUPP_RESPONSE_filed_042516.pdf	131617 7110ae09ac69f7710a975da5f2e160da46d81448	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	1
	Claims	2	3
	Applicant Arguments/Remarks Made in an Amendment	4	6
Warnings:			
Information:			
	Total Files Size (in bytes):	131617	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for 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.

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New International Application Filed with the USPTO as a Receiving Office
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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **04/25/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DENISE T. LILES/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 04/28/2016

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

EXAMINER	
HOEY, ALISSA L	

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
04/28/2016	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
lsmith@kwanip.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	ALISSA L. HOEY	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *ALISSA L. HOEY*. (3)_____.

(2) *JOSHUA CHANG*. (4)_____.

Date of Interview: *22 April 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1,2 and 4*.

Identification of prior art discussed: *Summers et al. (US 3,877,076)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Discussed the amendment submited 04/21/16 and ways to get around the prior art of record by incorporating claims 2 and 4 into claim 1 and detailing the adjacent parallel and oppoisitely orientated diagonal trusses of the two different layers. Further, the double patenting rejections would be moot based upon the discussed proposed claim amendments .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/ALISSA L HOEY/ Primary Examiner, Art Unit 3765	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 05/05/2016

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

EXAMINER
HOEY, ALISSA L

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
05/05/2016	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
lsmith@kwanip.com

Office Action Summary	Application No. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner ALISSA L. HOEY	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 *04/25/16*.

☐ 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) *1,3 and 5-20* is/are pending in the application.

5a) Of the above claim(s) *3,6 and 12-20* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1, 5 and 7-11 are* 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 _____ 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

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

Response to Amendment

2. This is in response to amendment received on 04/25/16. Claims 1 and 5 have been amended, claims 3, 6 and 12-20 have been withdrawn and claims 2 and 4 have been cancelled. Claims 1, 5 and 7-11 are examined below.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the amended language of claim 1 is not found in the specification: "wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and an inner energy and impact transforming layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer; wherein the second plurality of thin elastomeric trusses are arranged such that

each thin elastomeric truss is parallel to adjacent thin elastomeric trusses wherein the second direction is opposite to the first direction".

Double Patenting

4. 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. See MPEP §

717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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.

5. Claims 1, 5 and 7-11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319 in view of Hawkins (US 2002/0172783). The patent teaches a helmet with and impact transformer layers (elastomeric trusses or means) between an outer and outer shell, middle shell and interior lining (see claims 1-20 of US 8,863,319). Hawkins teaches an impact transformer layer having a first layer of parallel and diagonally orientated trusses and a second layer of parallel, diagonally and oppositely orientated trusses (see figure 5: paragraph 0063). It would have been obvious to have provided the impact transformer layers of '319 with the trusses arrangement as taught by Hawkins et al., since the impact transformer layers of '319 provided with oppositely orientated trusses would

provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 5 and 8-9 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783).

In regard to claim 1, Hawkins '755 teaches a protective gear, comprising:

a helmet (figure 16), the helmet comprising:

an outer shell layer (310);

a middle shell layer (can be stacked: paragraph 0050 which would provide a middle shell layer;

an inner shell layer (302);

an outer energy and impact transformer layer (308) connecting the outer shell layer to the middle shell layer (302)(paragraph 0050), wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses (312)(paragraph

0061) configured to absorb energy from mechanical forces imparted onto the outer shell layer (paragraphs 0051-0053), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer (figures 4A-4C), wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses (figures 4A-4C and figure 16); and an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (see paragraph 0050: stacked layered), wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer and wherein the inner energy and impact second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses (figure 16: paragraphs 0050 and 0061)

However, Hawkins et al. fails to teach wherein the second plurality of elastomeric trusses lies in a second direction that is opposite to the first plurality of elastomeric trusses direction.

Hawkins et al. '783 teaches trusses that are stacked, diagonal and lie in opposed directions (see figure 5: paragraph 0063).

It would have been obvious to have provided the impact transformer layers of Hawkins et al. '755 with the trusses arrangement as taught by Hawkins et al. '783, since the impact transformer layers of '755 provided with oppositely orientated trusses would

provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer creating a more protective and impact absorbing structure.

In regard to claim 5, Hawkins et al. '755 teaches wherein the outer energy and impact transformer laver includes a fluid (122) for absorbing impact energy and increasing the resistance to an applied force (paragraph 0053).

In regard to claim 8, Hawkins et al. '755 teaches wherein mechanical forces include impact forces (paragraph 0061; figures 4A-4C).

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces (paragraph 0061; figures 4A-4C).

8. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) and Hawkins et al. (US 2002/0172783) in further view of Ellis (US 2008/0086916).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fails to teach the outer energy and impact transformer layer comprises a magneto-rheological element, Hawkins et al. teaches a fluid located in the energy and impact transforming layer (122)(paragraph 0053).

In regard to claim 7, Ellis teaches a helmet with an energy and impact transformer layer comprising a magneto-rheological element (Figs. 24A-24D; paragraphs 0017, 0026 and 0098).

It would have been obvious to have provided the helmet of Hawkins et al. and Hawkins et al. with the magneto-rheological element of Ellis, since the helmet of Hawkins et al. and Hawkins et al. provided with a magneto-rheological element in the impact transformer layer would allow for controlled motion and impact cushioning level between the inner and outer layer depending upon the manipulating of the magnetro-rheological element.

9. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) and Hawkins et al. (US 2002/0172783) in view of Copeland (US 2006/0070170).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fail to teach a lining layer is connected to the inner shell layer and wherein the lining layer is configured to conform to a human head and wherein the lining layer comprises foam.

In regard to claims 10 and 11, Copeland teaches an inner lining (19) of foam (paragraph 0023) connected to the inner shell to conform to a human head (see figures 3 and 8).

It would have been obvious to have provided the helmet of Hawkins et al.. with the inner lining of foam as taught by Copeland, since the helmet of Hawkins et al. provided with an inner lining foam layer would provide additional comfort and protection to the user's head.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 5 and 7-11 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and can be found cited in PTO-892 form submitted herewith.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISSA L. HOEY whose telephone number is (571)272-4985. The examiner can normally be reached on M-F (9:00-6:30)Second Friday Off.

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 the organization where this application or proceeding is assigned is 571-273-8300.

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

/ALISSA L HOEY/
Primary Examiner, Art Unit 3765

Notice of References Cited	Application/Control No. 13/554,563	Applicant(s)/Patent Under Reexamination KNIGHT, ROBERT T.	
	Examiner ALISSA L. HOEY	Art Unit 3765	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-3,809,420 A	05-1974	Weller; Peter A.	B60R19/26	188/268
*	B	US-2002/0172783 A1	11-2002	Hawkins, Gary F.	B29C70/70	428/34.1
*	C	US-8,931,606 B2	01-2015	Hawkins; Gary F.	F16F1/50	188/371
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	Art Unit
	ALISSA L HOEY	3765

CPC- SEARCHED		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06; A42B3/064	10/15/15	ALH
Updated Search	04/28/16	ALH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
2	411, 425, 410	10/15/15	ALH
2	Updated Search	04/28/16	ALH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search, see for details	10/15/15	ALH

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	ALISSA L HOEY	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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

CLAIM		DATE								
Final	Original	10/15/2015	04/28/2016							
	1	✓	✓							
	2	✓	-							
	3	N	N							
	4	✓	-							
	5	✓	✓							
	6	N	N							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	N	N							
	13	N	N							
	14	N	N							
	15	N	N							
	16	N	N							
	17	N	N							
	18	N	N							
	19	N	N							
	20	N	N							

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 July 5, 2016.

Signed: _____/Leslie Russell/_____
Leslie Russell

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Final Office Action dated May 5, 2016, a response to which is due July 5, 2016.

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

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Previously Presented) The helmet of claim 1, wherein the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Final Office action mailed May 5, 2016 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins -755 and Hawkins '783 in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins -755 and Hawkins '783 in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

OBJECTION TO THE SPECIFICATION

In the Office Action, the Examiner objected to the specification because the specification allegedly does not provide proper antecedent basis for the claimed subject matter. While Applicants disagree and submit that the specification does provide proper antecedent basis, Applicants will nonetheless amend the specification should it be deemed necessary at the close of prosecution.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and various other references for some dependent claims. However, Applicants respectfully disagree. Applicants agree that Hawkins '755 does show parallel structures, or "machine elements," used for diverting and absorbing forces. However, Applicants disagree with the Examiner about Hawkins '755 teaching a middle shell layer separating two

different energy and impact transformer layers. The Examiner cites 0050 of Hawkins '755 for teaching such a feature. Paragraph 0050 is reproduced below.

> [0050] It should be noted that the machine elements 108 are not limited to the configuration and arrangement described above. By way of example, but not limitation, the end portions 110 and/or end portions 112 of adjacent machine elements 108 may be attached to one another. The machine elements 108 may also be spaced longitudinally (i.e. end to end) in addition to laterally. The machine elements 108 may also be stacked so that there will be more than one layer of machine elements. Other shapes may also be employed. For example, Z-shaped machine elements with only a single transverse portion may be employed. Another exemplary machine element configuration, which consists solely of a single transverse structure, is discussed below with reference to FIG. 7.

The Examiner states in the Office Action that since machine elements 108 may be stacked, stacking would provide a middle shell layer (Office Action, p. 5). However, Applicants respectfully disagree with the Examiner's inference based on the stacking. From reading paragraph 0050 of Hawkins '755 in view of other portions of Hawkins '755, it becomes clear that stacking, as mentioned in paragraph 0050, refers to stacking of machine elements 108 on top of one another but still within structure 104 and structure 118, which form the boundaries of the machine elements 108. Structure 104 is a force spreading structure preferably made of rigid materials (Hawkins '755, paragraph 0051) and structure 118 is the structure being protected. Nowhere in the reference does it say multiple structures layers of 104 are stacked in between machine element 108 layers, or that multiple machine element 108 layers are stacked in between multiple 104 layers (or structure 118 layers for that matter). In addition, none of the 23 figures of Hawkins '755 show multiple "rigid" layers 104 (or 118) corresponding to the multiple shell layers recited in the claims. Therefore, Applicants submit that Hawkins '755 does not teach or suggest a middle shell layer as recited in the claims.

Further, Hawkins '783 also does not teach or suggest such feature. While Figure 5 shows two layers 114a and 114b, the two layers are not separated by an additional layer 112. Thus, neither Hawkins '775 nor Hawkins '783 teaches the middle shell layer recited in the claims. The dependent claims, by virtue of their dependency, incorporate all features of their respective independent claims and are patentable over the cited art for at least the same reasons as given for

their respective independent claims. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Joshua Chang/

Joshua Chang
Reg. 70,831

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2000 Hearst Street, Ste. 305
Berkeley, CA 94709
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jchang@kwanip.com

Electronic Acknowledgement Receipt

EFS ID:	26262369
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Leslie Russell
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	06-JUL-2016
Filing Date:	20-JUL-2012
Time Stamp:	00:00:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_RESPONSE_to_FOA_filed_7_5_16.pdf	114403 af94015948778d43bddc99062f9f2de1db0f623a	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	7
Warnings:			
Information:			
	Total Files Size (in bytes):	114403	

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **07/06/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
RUBY JOHNSON

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 07/13/2016

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

EXAMINER
HOEY, ALISSA L

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
07/13/2016	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
lsmith@kwanip.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	CLINTON T. OSTRUP	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CLINTON T. OSTRUP*. (3)_____.

(2) *Joshua Chang*. (4)_____.

Date of Interview: *07 July 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *n/a*.

Identification of prior art discussed: *See Continuation Sheet*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

See Continuation Sheet .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

	/CLINTON T. OSTRUP/ Supervisory Patent Examiner, Art Unit 3765

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Identification of prior art discussed: Mr. Chang asked for clarification to the Specification objection and SPE Ostrup indicated that the specification should provide antecedent basis for claimed subject matter and that he should indicate where in the application, as originally filed, support could be found for said subject matter. Mr. Chang indicated that it was located in the figures and that he would point to where it was found. The combination of references was discussed and it was agreed that an examiner assigned to the application would determine whether an interview would be appropriate due to the application currently being under Final Rejection with an After Final Response filed.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 07/26/2016

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

EXAMINER	
HADEN, SALLY CLINE	

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
07/26/2016	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.

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docket@kwanip.com
alundy@kwanip.com
lsmith@kwanip.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	Sally Haden	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Sally Haden*. (3)_____.

(2) *Joshua Chang*. (4)_____.

Date of Interview: *19 July 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *Hawkins et al. (US 2007/0068755)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant and Examiner discussed Applicant's request for consideration received on 06 July 2016. As shown in Hawkins' figure 6, machine element 108 is comprised of upper 110 and lower 112 portions, as well as elements 114 and 116 which extend between the upper and lower portions. Examiner is interpreting 114 and 116 as the claimed thin elastomeric trusses. Hawkins' pp 0050 discloses machine elements 108 may be stacked so that there will be more than one layer of machine elements. When there are two layers of machine elements, the upper portion 110 of the upper layer is attached to 310 and the lower portion 112 of the lower layer is attached to 302. The lower portion 112 of the upper layer and the upper portion 110 of the lower layer would in combination form the middle shell layer. No agreement was reached. An advisory action is included with this interview summary.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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☒ Attachment

/Sally Haden/ Examiner, Art Unit 3765	

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- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
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3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
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Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/554,563	**Applicant(s)** KNIGHT, ROBERT T.	
	Examiner Sally Haden	**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 --

THE REPLY FILED 06 July 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;

(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☐ The period for reply expires _____months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☐ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

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

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.

13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

14. ☒ Other: Please see attached interview summary PTO-413.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: .

Claim(s) objected to: .

Claim(s) rejected: 1,5 and 7-11.

Claim(s) withdrawn from consideration: 3,6 and 12-20.

/Sally Haden/
Examiner

Continuation of 12. does NOT place the application in condition for allowance because: As shown in Hawkins' figure 6, machine element 108 is comprised of upper 110 and lower 112 portions, as well as elements 114 and 116 which extend between the upper and lower portions. Examiner is interpreting 114 and 116 as the claimed thin elastomeric trusses. Hawkins' pp 0050 discloses machine elements 108 may be stacked so that there will be more than one layer of machine elements. When there are two layers of machine elements, the upper portion 110 of the upper layer is attached to 310 and the lower portion 112 of the lower layer is attached to 302. The lower portion 112 of the upper layer and the upper portion 110 of the lower layer would in combination form the middle shell layer.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	Sally Haden	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Sally Haden*. (3)_____.

(2) *Joshua Chang*. (4)_____.

Date of Interview: *19 July 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *Hawkins et al. (US 2007/0068755)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant and Examiner discussed Applicant's request for consideration received on 06 July 2016. As shown in Hawkins' figure 6, machine element 108 is comprised of upper 110 and lower 112 portions, as well as elements 114 and 116 which extend between the upper and lower portions. Examiner is interpreting 114 and 116 as the claimed thin elastomeric trusses. Hawkins' pp 0050 discloses machine elements 108 may be stacked so that there will be more than one layer of machine elements. When there are two layers of machine elements, the upper portion 110 of the upper layer is attached to 310 and the lower portion 112 of the lower layer is attached to 302. The lower portion 112 of the upper layer and the upper portion 110 of the lower layer would in combination form the middle shell layer. No agreement was reached. An advisory action is included with this interview summary.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☒ Attachment

/Sally Haden/ Examiner, Art Unit 3765	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

DO NOT ENTER: /S.C.H/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 July 5, 2016.

Signed: _____/Leslie Russell/_____
Leslie Russell

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Final Office Action dated May 5, 2016, a response to which is due July 5, 2016.

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

Remarks/Arguments begin on page 5 of this paper.

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
BRGDP002	13/554,563	July 20, 2012
First Named Inventor:	**Title:**	
Robert T. Knight	ENERGY AND IMPACT TRANSFORMER LAYER	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) (a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)), or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
   - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
   - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
     - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
     - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
       - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
       - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Joshua Chang/	2016-08-04
Name (Print/Typed) Joshua Chang	**Practitioner Registration No.** 70831

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 August 4, 2016.

Sigued: _____/Sally Austin/_____
Sally Austin

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Advisory Action dated July 26, 2016 affirming the Final Office Action dated May 5, 2016, a response to which is due August 5, 2016.

Amendments to the Specification begin on page 2 of this paper.
Amendments to the Claims are reflected in the listing of claims which begin on page 3 of this paper.
Remarks/Arguments begin on page 6 of this paper.

Amendments to the Specification:

Please replace paragraph [0057] of the specification with the following paragraph:

[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. In some embodiments, the thin elastomeric trusses in impact transformer layer 511 are arranged such that each thin elastomeric truss is diagonally connected to outer shell layer 501 and to middle shell layer 503 in one direction. In such embodiments, each of the thin elastomeric trusses is parallel to its adjacent thin elastomeric trusses. In some embodiments, the thin elastomeric trusses in impact transformer layer 513 are also arranged such that each thin elastomeric truss is diagonally connected to middle shell layer 503 and to inner shell layer 505 in one direction. Also in such embodiments, each of the thin elastomeric trusses is parallel to its adjacent thin elastomeric trusses. In some embodiments, the thin elastomeric trusses in layer 511 and the thin elastomeric trusses in layer 513 are oriented in different or even opposite directions.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction;

wherein the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics, resins, metal, and composites;

wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy or transformational

energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Previously Presented) The helmet of claim 1, wherein the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Advisory Action dated July 26, 2016 (hereinafter, "the Advisory Action) affirming the Final Office action mailed May 5, 2016 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins -755 and Hawkins '783 in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins -755 and Hawkins '783 in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

INTERVIEW SUMMARY

Applicants thank Examiner Sally Haden for her comments during a telephonic interview on July 19, 2016 with Applicants' representative. In the interview, the Examiner and Applicants' representative discussed the claims, the response filed on July 5, 2016, and the prior art references. The Examiner explained that the upper 110 and lower 112 portions of machine elements 108 of Hawkins '755 were interpreted as the "middle layer" when the machine elements 108 were stacked on top of one another. Applicants' representative suggested amending the claims to clarify that the shell layers were made of different material than the thin elastomeric trusses. The Examiner indicated such amendments would seem to be in the right direction. No agreement was reached.

AMENDMENTS TO THE SPECIFICATION

In the Office Action, the Examiner objected to the specification because the specification allegedly does not provide proper antecedent basis for the claimed subject matter. However, Applicants have amended the specification as provided above, thereby obviating the objection.

Applicants submit that such amendments do not constitute new matter because the amended language is clearly reflected in Figure 5.

AMENDMENTS TO THE CLAIMS

Claim 1 has been amended to recite: "wherein the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics, resins, metal, and composites," and "wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials." Support for the amendments can be found throughout the application, for example, at paragraphs 0039 and 0061 of the specification as filed.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and various other references for some dependent claims. In response, Applicants have argued in the response filed on July 5, 2016, that neither of the Hawkins references teach nor suggest multiple "rigid" layers corresponding to the multiple shell layers recited in the claims. However, in the Advisory Action and in the Examiner Interview, Examiner Haden clarified that the upper 110 and lower 112 portions of machine elements 108 were interpreted as the "middle layer" when stacked. Consequently, Applicants have amended the claims to clarify that the outer, middle, and inner shell layers comprise different materials than the materials in the thin elastomeric trusses. Since the upper 110 and lower 112 portions of machine element 108 are made of the same material as transverse portions 114 and 116, which the Examiner is interpreting as the "thin elastomeric trusses." Thus, Applicants submit that the claims are patentable over the cited art. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Joshua Chang/

Joshua Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501 ext 706
jchang@kwanip.com

Electronic Acknowledgement Receipt

EFS ID:	26544860
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Sally Austin
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	04-AUG-2016
Filing Date:	20-JUL-2012
Time Stamp:	18:45:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_AA_Response_AFCP_filed_080416.pdf	1095084 8a6dc7a18529d5bacd439fa20252a82fb5e4eab4	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	After Final Consideration Program Request	1	1
	Response After Final Action	2	2
	Specification	3	3
	Claims	4	6
	Applicant Arguments/Remarks Made in an Amendment	7	9
Warnings:			
Information:			
	Total Files Size (in bytes):	1095084	

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **08/04/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/STELLA LITTLE/

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

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.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 08/18/2016

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
08/18/2016	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
lsmith@kwanip.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/554,563	**Applicant(s)** KNIGHT, ROBERT T.	
	Examiner Sally Haden	**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 --

THE REPLY FILED 04 August 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;

(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: *The subject matter added to claim 1 requires further search and consideration and could necessitate a new grounds of rejection*. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

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

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.

13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

14. ☐ Other: _____.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: .

Claim(s) objected to: .

Claim(s) rejected: 1,5 and 7-11.

Claim(s) withdrawn from consideration: 3,6 and 12-20

/Sally Haden/
Examiner, Art Unit 3765

DO NOT ENTER: /S.C.H/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Hoey, Alissa L.
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 August 4, 2016.

Sigued: _____/Sally Austin/_____
Sally Austin

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

It is respectfully submitted that the Examiner enters the following amendments in response to the Advisory Action dated July 26, 2016 affirming the Final Office Action dated May 5, 2016, a response to which is due August 5, 2016.

Amendments to the Specification begin on page 2 of this paper.
Amendments to the Claims are reflected in the listing of claims which begin on page 3 of this paper.
Remarks/Arguments begin on page 6 of this paper.

PTO/SB/30EFS (07-14)
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 contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13554563	Filing Date	2012-07-20	Docket Number (if applicable)	BRGDP002	Art Unit	3765
First Named Inventor	Robert T. Knight			Examiner Name	Haden, Sally Cline		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☒ Other Amendments filed on August 5, 2016

☐ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☐ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-14)
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 contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Joshua Chang/	Date (YYYY-MM-DD)	2016-08-29
Name	Joshua Chang	Registration Number	70831

This collection of information is required by 37 CFR 1.114. 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.

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 the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	13554563
Filing Date:	20-Jul-2012
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Joshua Chang/Sally Austin
Attorney Docket Number:	BRGDP002

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:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
RCE- 1st Request	2801	1	600	600
		Total in USD ($)		**700**

Electronic Acknowledgement Receipt

EFS ID:	26768725
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Sally Austin
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	29-AUG-2016
Filing Date:	20-JUL-2012
Time Stamp:	17:23:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$700
RAM confirmation Number	083016INTEFSW17251000
Deposit Account	3347
Authorized User	Leslie Russell

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

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 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	Request for Continued Examination (RCE)	BRGDP002_RCE_filed_082916.pdf	73142 8182f754bebb54eaed18d574c131f4b7607e0f51	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32404 2e4b2429904468b8daca49e1a8bb7057a21a0d33	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	105546		

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
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PTO/SB/06 (09-11)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

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☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
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☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **08/29/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
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☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/LINDA A. WASHINGTON/

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

Electronic Acknowledgement Receipt

EFS ID:	26768725
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Sally Austin
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	29-AUG-2016
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Authorized User	Leslie Russell

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

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 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	Request for Continued Examination (RCE)	BRGDP002_RCE_filed_082916.pdf	73142 8182f754bebb54eaed18d574c131f4b7607e0f51	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32404 2e4b2429904468b8daca49e1a8bb7057a21a0d33	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	105546		

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 02/03/2017

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
02/03/2017	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
lsmith@kwanip.com

Office Action Summary	Application No. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner Sally Haden	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 *8/29/2016*.

☐ 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) *1,3 and 5-20* is/are pending in the application.

5a) Of the above claim(s) *3,6 and 12-20* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,5 and 7-11* 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 *7/20/2014* 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 29 August 2016 has been entered.

Response to Amendment

Applicant's amendment, filed 04 August 2016, has been reviewed and entered. Claim 1 is amended, claims 2 and 4 are canceled and claims 3, 6, and 12-20 are withdrawn, leaving claims 1, 3, and 5-20 pending with claims 1, 5, and 7-11 presented for examination. This Office Action is a non-final rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office 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. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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.

2. Claims 1, 5 and 7-11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319 in view of Hawkins (US 2002/0172783). The patent teaches a helmet with and impact transformer layers (elastomeric trusses or means) between an outer and outer shell, middle shell and interior lining (see claims 1-20 of US 8,863,319). Hawkins teaches an impact transformer layer having a first layer of parallel and diagonally orientated trusses and a second layer of parallel, diagonally and oppositely orientated trusses (see figure 5: paragraph 0063). It would have been obvious to have provided the impact transformer layers of '319 with the trusses arrangement as taught by Hawkins et al., since the impact transformer layers of '319 provided with oppositely orientated trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer.

Claim Rejections - 35 USC § 103

3. Claims 1, 5, 8, and 9 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202).

As to claim 1, Hawkins'755 discloses protective gear, comprising:

a helmet (300), the helmet comprising:

an outer shell layer (310);

an inner shell layer (302);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (308, see modification below regarding the middle shell layer), wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction (fig 4A) and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses (fig 4A); and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (308, pp 0050 discloses stacking the layer which would result in at

least outer and inner energy impact transformer layers, and see modification below regarding the middle shell layer), wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the middle shell layer to rotate relative to the inner shell layer.

wherein the plurality of thin elastomeric trusses are comprised of material (pp 0051) that absorbs and dissipates (capable of absorbing and dissipating) mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials (104, pp 0051).

Hawkins'755 does not disclose a middle shell layer and the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics, resins, metal, and composites.

Larry teaches a similar protective gear (col 1 line 10-15), including an outer shell layer (12); a middle shell layer (13); an inner shell layer (14);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (combination 16 and 18 as shown in fig 1), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (combination 16 and 18 as shown in fig 1), wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics (col 3 line 40-45), resins (col 3 line 40-45), metal, and composites.

Both Hawkins'755 and Larry teach layers of energy and impact transformer materials (Larry 16 and Hawkins'755108). The difference between Hawkins'755 and Larry is that Hawkins'755 discloses stacking the layers directly on top of one another and Larry discloses stacking the layers on top of one another with an intermediate middle layer 13.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the protective gear of Hawkins'755 with a middle shell layer as taught by Larry in order to achieve the claimed invention for the purpose of providing shock distribution or absorption (Larry col 1 line 5-10).

Hawkins'755 does not disclose wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction.

Hawkins'783 discloses trusses that are stacked, diagonal, and lie in opposed directions (see figure 5 and pp 0063).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the impact transformer layers of Hawkins'755 with the truss arrangement as taught by Hawkins'783, since the impact transformer layers of '755 provided with oppositely oriented trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer creating a more protective and impact absorbing structure.

In regard to claim 5, Hawkins et al. '755 teaches wherein the outer energy and impact transformer laver includes a fluid (122) for absorbing impact energy and increasing the resistance to an applied force (paragraph 0053).

In regard to claim 8, Hawkins et al. '755 teaches wherein mechanical forces include impact forces (paragraph 0061: figures 4A-4C).

As to claim 9, Hawkins'755 as modified discloses the helmet of claim 1, wherein mechanical forces include rotational and shear forces (paragraph 0061: figures 4A-4C).

4. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Ellis (US 2008/0086916).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fails to teach the outer energy and impact transformer layer comprises a magneto-rheological element, Hawkins et al. teaches a fluid located in the energy and impact transforming layer (122)(paragraph 0053).

In regard to claim 7, Ellis teaches a helmet with an energy and impact transformer layer comprising a magneto-rheological element (Figs. 24A-24D; paragraphs 0017, 0026 and 0098).

It would have been obvious to have provided the helmet of Hawkins et al. and Hawkins et al. with the magneto-rheological element of Ellis, since the helmet of Hawkins et al. and Hawkins et al. provided with a magneto-rheological element in the impact transformer layer would allow for controlled motion and impact cushioning level between the inner and outer layer depending upon the manipulating of the magnetro-rheological element.

5. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Copeland (US 2006/0070170).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fail to teach a lining layer is connected to the inner shell layer and wherein the lining layer is configured to conform to a human head and wherein the lining layer comprises foam.

In regard to claims 10 and 11, Copeland teaches an inner lining (19) of foam (paragraph 0023) connected to the inner shell to conform to a human head (see figures 3 and 8).

It would have been obvious to have provided the helmet of Hawkins et al.. with the inner lining of foam as taught by Copeland, since the helmet of Hawkins et al. provided with an inner lining foam layer would provide additional comfort and protection to the user's head.

Response to Arguments

Applicant's arguments filed 04 August 2016 have been fully considered but they are not persuasive. Applicant's arguments are drawn to the amendments in claim 1 which are addressed in the rejection above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sally Haden whose telephone number is (571)272-6731. The examiner can normally be reached on M - F, 9AM - 5PM EST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Clinton Ostrup can be reached on 571-272-5559. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Sally Haden/
Primary Examiner
Art Unit 3765

/S. H./
Primary Examiner, Art Unit 3765

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	Art Unit
	ALISSA L HOEY	3765

CPC- SEARCHED		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06; A42B3/064	10/15/15	ALH
Updated Search	04/28/16	ALH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
2	411, 425, 410	10/15/15	ALH
2	Updated Search	04/28/16	ALH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search, see for details	10/15/15	ALH
updated - see attached	1/30/2017	sch

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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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EAST Search History (Interference)

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1/30/2017 1:32:34 PM
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	ALISSA L HOEY	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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

CLAIM		DATE								
Final	Original	10/15/2015	04/28/2016	01/30/2017						
	1	✓	✓	✓						
	2	✓	-	-						
	3	N	N	N						
	4	✓	-	-						
	5	✓	✓	✓						
	6	N	N	N						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	✓	✓						
	11	✓	✓	✓						
	12	N	N	N						
	13	N	N	N						
	14	N	N	N						
	15	N	N	N						
	16	N	N	N						
	17	N	N	N						
	18	N	N	N						
	19	N	N	N						
	20	N	N	N						

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 May 3, 2017.
Signed: _____/Leslie Russell/_____
Leslie Russell

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

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Non Final Office Action dated February 3, 2017, a response to which is due May 3, 2017.

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

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction;

wherein the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites;

wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Previously Presented) The helmet of claim 1, wherein the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Non Final Office action mailed February 3, 2017 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783") and Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins '755, Hawkins '783, and Larry, in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins '755, Hawkins '783, and Larry, in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

AMENDMENTS TO THE CLAIMS

Claim 1 has been amended to recite: "wherein the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites." Support for the amendments can be found throughout the application, for example, at paragraphs 0048 of the specification as filed.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and Larry, in addition to various other references for some dependent claims. In response, Applicants have amended the claims as recited above. Applicants submit that none of the cited references teaches the outer, middle, and inner shells comprising "reinforcing aramids," as recited in the amended claims. Thus, Applicants submit that the claims

are patentable over the cited art. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No BRGDP002).

Respectfully submitted,

/Joshua W. Chang/

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Electronic Acknowledgement Receipt

EFS ID:	29111249
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Leslie Russell
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	03-MAY-2017
Filing Date:	20-JUL-2012
Time Stamp:	23:09:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_RESPONSE_OA.pdf	106893 85418d8489389da259fa07445eb818a93c4df477	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	6
Warnings:			
Information:			
	Total Files Size (in bytes):	106893	

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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **05/03/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
Davina Butler

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

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 07/12/2017

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
07/12/2017	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
lsmith@kwanip.com

Office Action Summary	Application No. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner Sally Haden	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 *5/3/2017*.

☐ 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) *1,3 and 5-20* is/are pending in the application.

5a) Of the above claim(s) *3,6 and 12-20* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,5 and 7-11* 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 *7/20/2014* 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Amendment

Applicant's amendment, filed 03 May 2017, has been reviewed and entered. Claim 1 is amended, claims 2 and 4 are canceled, and claims 3, 6, and 12-20 are withdrawn, leaving claims 1, 3, and 5-20 pending with claims 1, 5, and 7-11 presented for examination on the merits. This Office Action is a final rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office 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. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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.

2. Claims 1, 5 and 7-11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319 in view of Hawkins (US 2002/0172783). The patent teaches a helmet with and impact transformer layers (elastomeric trusses or means) between an outer and outer shell, middle shell and interior lining (see claims 1-20 of US 8,863,319). Hawkins teaches an impact transformer layer having a first layer of parallel and diagonally orientated trusses and a second layer of parallel, diagonally and oppositely orientated trusses (see figure 5: paragraph 0063). It would have been obvious to have provided the impact transformer layers of '319 with the trusses arrangement as taught by Hawkins et al., since the impact transformer layers of '319 provided with oppositely orientated trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer.

Claim Rejections - 35 USC § 103

3. Claims 1, 5, 8, and 9 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202).

As to claim 1, Hawkins'755 discloses protective gear, comprising:

a helmet (300), the helmet comprising:

an outer shell layer (310);

an inner shell layer (302);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (308, see modification below regarding the middle shell layer), wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction (fig 4A) and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses (fig 4A); and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (308, pp 0050 discloses stacking the layer which would result in at least outer and inner energy impact transformer layers, and see modification below regarding the middle shell layer), wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the middle shell layer to rotate relative to the inner shell layer.

wherein the plurality of thin elastomeric trusses are comprised of material (pp 0051) that absorbs and dissipates (capable of absorbing and dissipating) mechanical

energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials (104, pp 0051).

Hawkins'755 does not disclose a middle shell layer and the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites.

Larry teaches a similar protective gear (col 1 line 10-15), including an outer shell layer (12); a middle shell layer (13); an inner shell layer (14);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (combination 16 and 18 as shown in fig 1), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (combination 16 and 18 as shown in fig 1), wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics (col 3 line 40-45), resins (col 3 line 40-45), metal, and composites.

Hawkins'783 teaches it is known to provide layers comprised of reinforcing aramids (Kevlar impregnated within a binding matrix such as an epoxy resin, pp 0003, and Kevlar is an aramid) and one or more of the following materials: plastics, resins

(epoxy resin, pp 0003), metal (pp 0003), and composites (composite materials, pp 0003).

Hawkins'755 and Larry teach layers of energy and impact transformer materials (Larry 16 and Hawkins'755 108). The difference between Hawkins'755 and Larry is that Hawkins'755 discloses stacking the layers directly on top of one another and Larry discloses stacking the layers on top of one another with an intermediate middle layer 13.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the protective gear of Hawkins'755 with a middle shell layer as taught by Larry and further to provide the shell layers in reinforcing aramids and one or more of plastics, resins, metal, and composites as taught by Hawkins'783 in order to achieve the claimed invention for the purpose of providing shock distribution or absorption (Larry col 1 line 5-10) and because it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice (see MPEP 2144.07) and to provide the desired physical properties for the material (Hawkins'783 pp 0003).

Hawkins'755 does not disclose wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction.

Hawkins'783 discloses trusses that are stacked, diagonal, and lie in opposed directions (see figure 5 and pp 0063).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the impact transformer layers of Hawkins'755 with the truss arrangement as taught by Hawkins'783, since the impact transformer layers of '755 provided with oppositely oriented trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer creating a more protective and impact absorbing structure.

In regard to claim 5, Hawkins et al. '755 teaches wherein the outer energy and impact transformer laver includes a fluid (122) for absorbing impact energy and increasing the resistance to an applied force (paragraph 0053).

In regard to claim 8, Hawkins et al. '755 teaches wherein mechanical forces include impact forces (paragraph 0061: figures 4A-4C).

As to claim 9, Hawkins'755 as modified discloses the helmet of claim 1, wherein mechanical forces include rotational and shear forces (paragraph 0061: figures 4A-4C).

4. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783)

and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Ellis (US 2008/0086916).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fails to teach the outer energy and impact transformer layer comprises a magneto-rheological element, Hawkins et al. teaches a fluid located in the energy and impact transforming layer (122)(paragraph 0053).

In regard to claim 7, Ellis teaches a helmet with an energy and impact transformer layer comprising a magneto-rheological element (Figs. 24A-24D; paragraphs 0017, 0026 and 0098).

It would have been obvious to have provided the helmet of Hawkins et al. and Hawkins et al. with the magneto-rheological element of Ellis, since the helmet of Hawkins et al. and Hawkins et al. provided with a magneto-rheological element in the impact transformer layer would allow for controlled motion and impact cushioning level between the inner and outer layer depending upon the manipulating of the magnetro-rheological element.

5. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Copeland (US 2006/0070170).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fail to teach a lining layer is connected to the inner shell layer and wherein the lining layer is configured to conform to a human head and wherein the lining layer comprises foam.

In regard to claims 10 and 11, Copeland teaches an inner lining (19) of foam (paragraph 0023) connected to the inner shell to conform to a human head (see figures 3 and 8).

It would have been obvious to have provided the helmet of Hawkins et al.. with the inner lining of foam as taught by Copeland, since the helmet of Hawkins et al. provided with an inner lining foam layer would provide additional comfort and protection to the user's head.

Response to Arguments

Applicant's arguments filed 03 May 2017 have been fully considered but they are not persuasive. Applicant's arguments are drawn to the subject matter added to claim 1 and are addressed in the rejection of claim 1 above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sally Haden whose telephone number is (571)272-6731. The examiner can normally be reached on M - F, 930AM - 6PM EST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Clinton Ostrup can be reached on 571-272-5559. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Sally Haden/
Primary Examiner
Art Unit 3765

/S. H./
Primary Examiner, Art Unit 3765

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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EAST Search History (Interference)

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	ALISSA L HOEY	3765

CPC- SEARCHED		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06; A42B3/064	10/15/15	ALH
Updated Search	04/28/16	ALH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
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2	Updated Search	04/28/16	ALH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search, see for details	10/15/15	ALH
updated - see attached	1/30/2017	sch
updated - see attached	7/6/2017	sch

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	ALISSA L HOEY	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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

CLAIM		DATE								
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 October 12, 2017.
Signed: _____/Leslie Russell/_____
Leslie Russell

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Final Office Action dated July 12, 2017, a response to which is due October 12, 2017.

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

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer, wherein the outer shell layer is shaped like a helmet;

a middle shell layer, wherein the middle shell layer is shaped like a helmet;

an inner shell layer, wherein the inner shell layer is shaped like a helmet;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction;

wherein the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites;

wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Previously Presented) The helmet of claim 1, wherein the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Final Office action mailed July 12, 2017 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected the claims under non-statutory double patenting;
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783") and Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins '755, Hawkins '783, and Larry, in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins '755, Hawkins '783, and Larry, in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

AMENDMENTS TO THE CLAIMS

Claim 1 has been amended to recite: "wherein the outer shell layer is shaped like a helmet… wherein the middle shell layer is shaped like a helmet… wherein the inner shell layer is shaped like a helmet." Support for the amendments can be found throughout the application, for example, at Figure 6 of the application as filed.

DOUBLE PATENTING REJECTIONS

In the Office Action, the Examiner rejected the claims on the grounds of nonstatutory double patenting. Should it be deemed necessary at the close of prosecution, Applicants will timely file all necessary terminal disclaimers.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and Larry, in addition to various other references for some

dependent claims. In response, Applicants have amended the claims as recited above. Applicants submit that none of the cited references teaches the outer, middle, and inner shells being shaped like helmets. The Examiner admits that Hawkins only teaches an outer and inner layer for helmet. For the middle layer, the Examiner cites Larry. However, Larry only mentions a middle layer in terms of a clothing panel for protective clothing. Applicants submit that since clothing and helmets have very different structural needs, citing a clothing reference to be applied to a helmet reference is non-obvious. Thus, Applicants submit that the combination of Hawkins and Larry does not teach a middle helmet shaped layer. Thus, Applicants submit that the claims are patentable over the cited art. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No BRGDP002).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
BRGDP002	13/554,563	July 20, 2012
First Named Inventor:	**Title:**	
Robert T. Knight	ENERGY AND IMPACT TRANSFORMER LAYER	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Joshua W. Chang/	10/12/17
Name (Print/Typed) Joshua W. Chang	Practitioner Registration No. 271739

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt

EFS ID:	30644906
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang
Filer Authorized By:	
Attorney Docket Number:	BRGDP002
Receipt Date:	12-OCT-2017
Filing Date:	20-JUL-2012
Time Stamp:	21:21:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_OAF_07-12-17_Response_to_FOA_3_mo_due_10-12-17.pdf	115775 09b2860302c4c7e7ed5009b2d919870ea02bd93a	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	6

Warnings:					
Information:					
2	After Final Consideration Program Request	BRGDP002_AFCP_2_0_request.pdf	206653 2e7d070a464bf6ecee299bca30ada31adcc6910b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	322428		

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT

10/12/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
ANNETTE COWAN

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

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

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.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 11/03/2017

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
11/03/2017	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
lsmith@kwanip.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	Sally Haden	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Sally Haden*. (3)_____.

(2) *Joshua Chang*. (4)_____.

Date of Interview: *27 October 2017*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☒112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *n/a*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The amendment to claim 1 would necessitate an indefiniteness rejection for the recitation "shaped like a helmet." Applicant suggested "having a helmet shape" which would be a definite recitation but a broad recitation that may not overcome the art. Examiner suggested a recitation of the specific shape Applicant is intending by the recitation of a helmet shape in order to further define the invention, e.g., are the layers spherical or do they have a front, a back, a crown, and lateral sides? No agreement was reached. The claims are not entered on the grounds that they raise new considerations and could necessitate new grounds of rejection. An advisory action is included with this interview summary.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☒ Attachment

/Sally Haden/ Primary Examiner, Art Unit 3765	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/554,563	**Applicant(s)** KNIGHT, ROBERT T.	
	Examiner Sally Haden	**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 --

THE REPLY FILED 12 October 2017 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;

(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

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

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See attached interview summary.

13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

14. ☒ Other: see attached PTO-2323.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: .

Claim(s) objected to: .

Claim(s) rejected: 1,5 and 7-11.

Claim(s) withdrawn from consideration: 3,6 and 12-20.

/Sally Haden/
Primary Examiner, Art Unit 3765

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/554,563	KNIGHT, ROBERT T.	
	Examiner	Art Unit	
	Sally Haden	3765	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Sally Haden*. (3)_____.

(2) *Joshua Chang*. (4)_____.

Date of Interview: *27 October 2017*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☒112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

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Identification of prior art discussed: *n/a*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

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/Sally Haden/ Primary Examiner, Art Unit 3765	

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Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

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It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

DO NOT ENTER: /S.H./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 October 12, 2017.
Signed: _____/Leslie Russell/_____
Leslie Russell

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Final Office Action dated July 12, 2017, a response to which is due October 12, 2017.

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

Remarks/Arguments begin on page 5 of this paper.

AFCP 2.0 Decision	Application No.	Applicant(s)
	13/554,563	KNIGHT, ROBERT T.
	Examiner	Art Unit
	Sally Haden	3765

This is in response to the After Final Consideration Pilot request filed 12 October 2017.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other:

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☐ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.

   ☒ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other:

   Examiner Note: Please attach an interview summary when necessary as described above.

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13/554,563	Filing Date	2012-07-20	Docket Number (if applicable)	BRGDP002	Art Unit	3765
First Named Inventor	Robert T. Knight			Examiner Name	Haden, Sally Cline		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506367

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Joshua W. Chang/	Date (YYYY-MM-DD)	2017-12-06
Name	Joshua W. Chang	Registration Number	70831

This collection of information is required by 37 CFR 1.114. 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.

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 the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	13554563
Filing Date:	20-Jul-2012
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Joshua Chang/Kim Favinger
Attorney Docket Number:	BRGDP002

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:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	2820	1	850	850
		Total in USD ($)		**1150**

Electronic Acknowledgement Receipt

EFS ID:	31148109
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Kim Favinger
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	06-DEC-2017
Filing Date:	20-JUL-2012
Time Stamp:	18:11:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1150
RAM confirmation Number	120717INTEFSW18133600
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		BRGDP002_Response_filed_12-06-17.pdf	127401 898f3048fd0579c8cf3776cd956e5cba1d1ffd19	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	5	7
	Claims	2	4
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1

Warnings:

Information:

2	Request for Continued Examination (RCE)	BRGDP002_RCE_filed_12-06-17.pdf	86146 0ba5840e9aec36923ae04eb08194bfcac131c8b6	no	3

Warnings:

This is not a USPTO supplied RCE SB30 form.

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	32495 771794cbee9b76cee5b4e59add76f5f38379839d	no	2

Warnings:

Information:

Total Files Size (in bytes):	246042

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.

REMARKS

This amendment responds to the Advisory Action mailed November 3, 2017, affirming the rejections in the Final Office action mailed July 12, 2017 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected the claims under non-statutory double patenting;
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783") and Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins '755, Hawkins '783, and Larry, in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins '755, Hawkins '783, and Larry, in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

AMENDMENTS TO THE CLAIMS

Claim 1 has been amended to recite: "wherein the outer shell layer comprises a semi-spherical shape with a first and second aperture, the first aperture configured to allow a user's head to be placed inside the interior of the semi-spherical shape, the second aperture configured to allow the user to see outside the semi-spherical shape while the user's head is within the interior of the semi-spherical shape," "wherein the middle shell layer comprises a semi-spherical shape analogous to the outer shell layer," and "wherein the inner shell layer comprises a semi-spherical shape analogous to the middle layer." Support for the amendments can be found throughout the application, for example, at Figure 6 of the application as filed.

INTERVIEW SUMMARY

Applicants thank Examiner Sally Haden for her comments during a telephonic interview on October 27, 2017 with Applicants' representative. In the interview, the Examiner and Applicants' representative discussed the previously filed claim amendments and the prior art references. The Examiner indicated that the previously filed amendments would not be sufficient for overcoming

the prior art. Instead, the Examiner suggested amending the claims by describing in more detail the shape and structures of the shell layers. Applicants' representative agreed to amend the claims accordingly. No agreement was reached

DOUBLE PATENTING REJECTIONS

In the Office Action, the Examiner rejected the claims on the grounds of nonstatutory double patenting. Should it be deemed necessary at the close of prosecution, Applicants will timely file all necessary terminal disclaimers.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and Larry, in addition to various other references for some dependent claims. In response, Applicants have amended the claims as recited above. Applicants submit that none of the cited references teaches the outer, middle, and inner shells being shaped like helmets. The Examiner admits that Hawkins only teaches an outer and inner layer for helmet. For the middle layer, the Examiner cites Larry. However, Larry only mentions a middle layer in terms of a clothing panel for protective clothing. Applicants submit that since clothing and helmets have very different structural needs, citing a clothing reference to be applied to a helmet reference is non-obvious. In addition, the claims have been further amended to recite that all three layers have a semi-spherical shape with two apertures for a head to go through and to be able to see while the head is within the layers. Applicants submit that such amendments further distinguish the middle layer cited in the claims from the teaching of Larry. Thus, Applicants submit that the combination of Hawkins and Larry does not teach a middle helmet shaped layer. Thus, Applicants submit that the claims are patentable over the cited art. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or

concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No BRGDP002).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer, wherein the outer shell layer comprises a semi-spherical shape with a first and second aperture, the first aperture configured to allow a user's head to be placed inside the interior of the semi-spherical shape, the second aperture configured to allow the user to see outside the semi-spherical shape while the user's head is within the interior of the semi-spherical shape;

a middle shell layer, wherein the middle shell layer comprises a semi-spherical shape with two apertures analogous to the outer shell layer;

an inner shell layer, wherein the inner shell layer comprises a semi-spherical shape with two apertures analogous to the middle layer;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction;

wherein the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites;

wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Previously Presented) The helmet of claim 1, wherein the outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb

energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

CERTIFICATE OF EFS-WEB TRANSMISSION

I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to Mail Stop RCE, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on December 6, 2017.

Signed: _____/Kim Favinger/_____
Kim Favinger

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

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Advisory Action dated November 3, 2017, affirming the rejections in the Final Office Action dated July 12, 2017, a response to which is due December 12, 2017.

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

Remarks/Arguments begin on page 5 of this paper.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **12/06/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
NICOLLE L. SCRIVNER

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 07/19/2018

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3765	

NOTIFICATION DATE	DELIVERY MODE
07/19/2018	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
lsmith@kwanip.com

Office Action Summary	Application No. 13/554,563	Applicant(s) KNIGHT, ROBERT T.	
	Examiner Sally Haden	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 *12/6/17*.

☐ 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) *1,3 and 5-20* is/are pending in the application.

5a) Of the above claim(s) *3,6 and 12-20* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,5 and 7-11* 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 *9/3/2015* 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06 December 2017 has been entered.

Response to Amendment

Applicant's amendment, filed 06 December 2017, has been reviewed and entered. Claim 1 is amended, claims 2 and 4 are canceled, and claims 3, 6, 12-20 are previously withdrawn, leaving claims 1, 3, and 5-20 pending with claims 1, 5, and 7-11 presented for examination. This Office Action is a non-final rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first and second apertures of the outer shell layer and the two apertures of the middle and inner shell layers (claim 1) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Figures 2 and 6 appear to show first and second apertures of the outer shell layer, and so this objection may be overcome by providing one or both of figures 2 and 6 with reference characters for the first and second apertures. None of the figures appear to show the two apertures of the middle shell layer or the two apertures of the inner shell layer.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the middle shell layer comprising two apertures and the inner shell layer comprising two apertures.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 5, and 7-11 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites the middle shell

layer comprises two apertures and the inner shell layer comprises two apertures, but this has not been previously disclosed. Claims 5 and 7-11 are rejected for depending from rejected claim 1.

The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 5, and 7-11 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 1, line 9, what is analogous to the outer shell layer: the middle shell layer, the semi-spherical shape, or the two apertures? If it is the two apertures, how are they analogous to the outer shell layer? Should this be the two apertures being analogous to the two apertures of the outer shell layer?

Claim 1, line 11, what is analogous to the middle layer: the inner shell layer, the semi-spherical shape, or the two apertures? If it is the two apertures, how are they analogous to the middle layer? Should this be the two apertures being analogous to the two apertures of the middle shell layer?

Claim 1 recites the limitation "the middle layer" in line 11. There is insufficient antecedent basis for this limitation in the claim. Inserting “shell” after “middle” would be sufficient to overcome this rejection.

Claims that depend from a rejected claim are also rejected.

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. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for

applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/forms/. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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.

2. Claims 1, 5 and 7-11 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,863,319 in view of Hawkins (US 2002/0172783). The patent teaches a helmet with and impact transformer layers (elastomeric trusses or means) between an outer and outer shell, middle shell and interior lining (see claims 1-20 of US 8,863,319). Hawkins teaches an impact transformer layer having a first layer of parallel and diagonally orientated trusses and a second layer of parallel, diagonally and oppositely orientated trusses (see figure 5: paragraph 0063). It would have been obvious to have provided the impact transformer layers of '319 with the trusses arrangement as taught by Hawkins et al., since the impact transformer layers of '319 provided with oppositely orientated trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer.

Claim Rejections - 35 USC § 103

3. Claims 1, 5, 8, and 9 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Nakayama et al. (US 20010032351 A1), Hawkins et al. (US 2002/0172783), and Larry (US 4,213,202).

As to claim 1, as best understood, Hawkins'755 discloses protective gear, comprising:

a helmet (300), the helmet comprising:

an outer shell layer (310), wherein the outer shell layer comprises a semi-spherical shape with a first aperture, the first aperture configured to allow a user's head to be placed inside the interior of the semispherical shape;

an inner shell layer (302), wherein the inner shell layer comprises a semispherical shape (as shown in figure 16, 302 is coextensive with 310 which would obviously result in 302 having at least some of the same semispherical shape as 310);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (308, see modification below regarding the middle shell layer), wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin

elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction (fig 4A) and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses (fig 4A); and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (308, pp 0050 discloses stacking the layer which would result in at least outer and inner energy impact transformer layers, and see modification below regarding the middle shell layer), wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses (312) configured to absorb (capable of absorbing, pp 0051-0053) energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows (capable of allowing, figs 4A-4C) the middle shell layer to rotate relative to the inner shell layer.

wherein the plurality of thin elastomeric trusses are comprised of material (pp 0051) that absorbs and dissipates (capable of absorbing and dissipating) mechanical energy as thermal energy or transformational energy, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials (104, pp 0051).

Hawkins'755 does not disclose the outer shell layer has a second aperture.

Nakayama teaches a similar helmet (title), including an outer shell layer (11) comprising a semispherical shape with a first and second aperture, the first aperture configured to allow a user's head to be placed inside the interior of the semispherical

shape, the second aperture configured to allow the user to see outside the semispherical shape while the user's head is within the interior of the semispherical shape (fig 1). Nakayama's second aperture is formed by providing an additional component that covers the lower portion of the wearer's face. Providing Hawkins'755 would provide additional protection to the wearer's face as well as divide the single aperture into a first and second aperture.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the helmet of Hawkins'755 with the lower face guard of Nakayama which would result in a first and second aperture, for the purpose of protecting a greater area of the wearer's head.

Hawkins'755 does not disclose a middle shell layer, wherein the middle shell layer comprises a semi-spherical shape with two apertures analogous to the outer shell; the inner shell layer comprises two apertures, and the outer, middle, and inner shell layers are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites.

Larry teaches a similar protective gear (col 1 line 10-15), including an outer shell layer (12); a middle shell layer (13); an inner shell layer (14);

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer (combination 16 and 18 as shown in fig 1), wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer (combination 16 and 18 as shown in fig 1), wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the outer, middle, and inner shell layers are comprised of one or more of the following materials: plastics (col 3 line 40-45), resins (col 3 line 40-45), metal, and composites.

Hawkins'783 teaches it is known to provide layers comprised of reinforcing aramids (Kevlar impregnated within a binding matrix such as an epoxy resin, pp 0003, and Kevlar is an aramid) and one or more of the following materials: plastics, resins (epoxy resin, pp 0003), metal (pp 0003), and composites (composite materials, pp 0003).

Hawkins'755 and Larry teach layers of energy and impact transformer materials (Larry 16 and Hawkins'755 108). The difference between Hawkins'755 and Larry is that Hawkins'755 discloses stacking the layers directly on top of one another and Larry discloses stacking the layers on top of one another with an intermediate middle layer 13.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the protective gear of Hawkins'755 with a middle shell layer as taught by Larry and further to provide the middle and inner shell layers with the same semispherical shape and two apertures analogous to the outer shell layer and middle layer, respectively, in order to adapt the layers to the shape of the helmet, and further to provide the shell layers in reinforcing aramids and one or more of plastics,

resins, metal, and composites as taught by Hawkins'783 in order to achieve the claimed invention for the purpose of providing shock distribution or absorption (Larry col 1 line 5-10) for the semispherical shape of the wearer's head and because it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice (see MPEP 2144.07) and to provide the desired physical properties for the material (Hawkins'783 pp 0003).

Hawkins'755 does not disclose wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the second direction is opposite to the first direction.

Hawkins'783 discloses trusses that are stacked, diagonal, and lie in opposed directions (see figure 5 and pp 0063).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the impact transformer layers of Hawkins'755 with the truss arrangement as taught by Hawkins'783, since the impact transformer layers of '755 provided with oppositely oriented trusses would provide layers that can be sheared by a force based upon the opposite orientation of the trusses in each layer creating a more protective and impact absorbing structure.

In regard to claim 5, Hawkins et al. '755 teaches wherein the outer energy and impact transformer laver includes a fluid (122) for absorbing impact energy and increasing the resistance to an applied force (paragraph 0053).

In regard to claim 8, Hawkins et al. '755 teaches wherein mechanical forces include impact forces (paragraph 0061: figures 4A-4C).

As to claim 9, Hawkins'755 as modified discloses the helmet of claim 1, wherein mechanical forces include rotational and shear forces (paragraph 0061: figures 4A-4C).

4. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Nakayama et al. (US 20010032351 A1), Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Ellis (US 2008/0086916).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fails to teach the outer energy and impact transformer layer comprises a magneto-rheological element, Hawkins et al. teaches a fluid located in the energy and impact transforming layer (122)(paragraph 0053).

In regard to claim 7, Ellis teaches a helmet with an energy and impact transformer layer comprising a magneto-rheological element (Figs. 24A-24D; paragraphs 0017, 0026 and 0098).

It would have been obvious to have provided the helmet of Hawkins et al. and Hawkins et al. with the magneto-rheological element of Ellis, since the helmet of Hawkins et al. and Hawkins et al. provided with a magneto-rheological element in the impact transformer layer would allow for controlled motion and impact cushioning level between the inner and outer layer depending upon the manipulating of the magnetro-rheological element.

5. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. (US 2007/0068755) in view of Nakayama et al. (US 20010032351 A1), Hawkins et al. (US 2002/0172783) and Larry (US 4,213,202) as applied to claim 1 above, and further in view of Copeland (US 2006/0070170).

Hawkins et al. and Hawkins et al. teach a helmet as described above in claim 1. However, Hawkins et al. and Hawkins et al. fail to teach a lining layer is connected to the inner shell layer and wherein the lining layer is configured to conform to a human head and wherein the lining layer comprises foam.

In regard to claims 10 and 11, Copeland teaches an inner lining (19) of foam (paragraph 0023) connected to the inner shell to conform to a human head (see figures 3 and 8).

It would have been obvious to have provided the helmet of Hawkins et al. with the inner lining of foam as taught by Copeland, since the helmet of Hawkins et al.

provided with an inner lining foam layer would provide additional comfort and protection to the user's head.

Response to Arguments

Applicant's arguments with respect to claim 1 has been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Applicant's arguments are drawn to newly added subject matter and are addressed in the rejection above. Applicant's argument that a protective layer for a helmet and a protective layer for a protective clothing would not be an obvious combination is not persuasive. An inventor considering a head worn protective layer would naturally look to references employing other body worn protective layers. Hawkins'755 illustrates this by providing his layer in protective clothing such as what is shown in figures 8-11 and 14 and by providing his layer in a helmet such as what is shown in figure 16. Furthermore, even though Hawkins'783 does not disclose the layer in a helmet or that the layer is in the shape of a helmet (e.g., semispherical), one of ordinary skill in the art would recognize that the layer would be provided in an appropriate size and shape to fit in a helmet, such as being coextensive with the other layers of the helmet.

In light of the above, the rejection is believed to be proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sally Haden whose telephone number is (571)272-6731. The examiner can normally be reached on M - F, 930AM - 6PM EST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Clinton Ostrup can be reached on 571-272-5559. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Sally Haden/
Primary Examiner
Art Unit 3765

/S. H./
Primary Examiner, Art Unit 3765

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	**Art Unit**
	ALISSA L HOEY	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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

CLAIM		DATE								
Final	Original	10/15/2015	04/28/2016	01/30/2017	07/06/2017	07/12/2018				
	1	✓	✓	✓	✓	✓				
	2	✓	-	-	-	-				
	3	N	N	N	N	N				
	4	✓	-	-	-	-				
	5	✓	✓	✓	✓	✓				
	6	N	N	N	N	N				
	7	✓	✓	✓	✓	✓				
	8	✓	✓	✓	✓	✓				
	9	✓	✓	✓	✓	✓				
	10	✓	✓	✓	✓	✓				
	11	✓	✓	✓	✓	✓				
	12	N	N	N	N	N				
	13	N	N	N	N	N				
	14	N	N	N	N	N				
	15	N	N	N	N	N				
	16	N	N	N	N	N				
	17	N	N	N	N	N				
	18	N	N	N	N	N				
	19	N	N	N	N	N				
	20	N	N	N	N	N				

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13554563	KNIGHT, ROBERT T.
	Examiner	Art Unit
	ALISSA L HOEY	3765

CPC- SEARCHED		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06; A42B3/064	10/15/15	ALH
Updated Search	04/28/16	ALH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
2	411, 425, 410	10/15/15	ALH
2	Updated Search	04/28/16	ALH

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

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search, see for details	10/15/15	ALH
updated - see attached	1/30/2017	sch
updated - see attached	7/6/2017	sch

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

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/554,563	Filing Date 07/20/2012	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $30 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $125 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	10/04/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	monique benjamin
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Robert T. Knight	Attorney Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Group: 3765
TITLE: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation No.: 9273

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 October 19, 2018.

Signed: _____Kim Favinger//_____
Kim Favinger

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

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Office Action dated July 19, 2018, a response to which is due October 19, 2018.

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

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer~~, wherein the outer shell layer comprises a semi-spherical shape with a first and second aperture, the first aperture configured to allow a user's head to be placed inside the interior of the semi-spherical shape, the second aperture configured to allow the user to see outside the semi-spherical shape while the user's head is within the interior of the semi-spherical shape~~;

a middle shell layer~~, wherein the middle shell layer comprises a semi-spherical shape with two apertures analogous to the outer shell layer~~;

an inner shell layer~~, wherein the inner shell layer comprises a semi-spherical shape with two apertures analogous to the middle layer~~;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss is parallel to adjacent thin elastomeric trusses, wherein the outer energy and impact transformer layer is filled with an absorptive fluid or gel; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss is parallel to adjacent thin

elastomeric trusses, wherein the second direction is opposite to the first direction, wherein the inner energy and impact transformer layer is filled with an absorptive fluid or gel;

wherein the outer, middle, and inner shell layers are configured to protect against penetrating forces and are comprised of reinforcing aramids and one or more of the following materials: plastics, resins, metal, and composites;

wherein the energy and impact transformer layers are configured to protect against compression forces, shear forces, impact forces, and rotational forces, wherein the energy and impact transformer layers also include passive, semi-active, and active dampers;

wherein the outer shell has significantly more weight, strength, and structural integrity than the middle shell and inner shell layers;

wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy ~~or transformational energy~~, wherein the elastomeric truss material is different in composition from the outer, middle, and inner shell layer materials.

2. (Cancelled)

3. (Withdrawn) The helmet of claim 1, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

4. (Cancelled)

5. (Currently Amended) The helmet of claim 1, wherein the absorptive fluid or gel in either of the energy and impact transformer layers comprises a smart fluid that undergoes changes in viscosity when a magnetic field is applied~~outer energy and impact transformer layer includes a fluid for absorbing impact energy and increasing the resistance to an applied force~~.

6. (Withdrawn) The helmet of claim 1, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

12. (Withdrawn) Protective gear, comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of conical structures configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer.

13. (Withdrawn) The protective gear of claim 12, wherein an outer energy and impact transformer layer connects the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of conical structures configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer.

14. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented outwardly, with bases situated on the middle shell layer.

15. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented outwardly, with bases situated on the inner shell layer.

16. (Withdrawn) The helmet of claim 12, wherein the first plurality of conical structures are oriented inwardly, with bases situated on the outer shell layer.

17. (Withdrawn) The helmet of claim 12, wherein the second plurality of conical structures are oriented inwardly, with bases situated on the middle shell layer.

18. (Withdrawn) The helmet of claim 12, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

19. (Withdrawn) The helmet of claim 12, wherein mechanical forces include impact forces.

20. (Withdrawn) The helmet of claim 12, wherein mechanical forces include rotational and shear forces.

REMARKS

This amendment responds to the Office action mailed July 19, 2018 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected the claims under non-statutory double patenting;
- rejected claims 1, 5, 8 and 9 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins et al (US 2007/0068755) (Hereinafter "Hawkins '755") in view of Nakayama (Hereinafter US 20010032351), Hawkins et al (US 2002/0172783) (Hereinafter "Hawkins '783") and Larry (US 4,213,202) (Hereinafter "Larry");
- rejected claims 7 under pre-AIA 35 U.S.C. 102b as being anticipated by Hawkins '755, Nakayama, Hawkins '783, and Larry, in further view of Ellis (US 2008/0086916) (Hereinafter "Ellis"); and
- rejected claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable Hawkins '755, Nakayama, Hawkins '783, and Larry, in further view of Copeland (US 2006/0070170) (Hereinafter "Copeland").

After entry of the amendment, the pending claims are: 1-20.

AMENDMENTS TO THE CLAIMS

Claim 1 has been amended to recite: "wherein the outer energy and impact transformer layer is filled with an absorptive fluid or gel," "wherein the outer, middle, and inner shell layers are configured to protect against penetrating forces," "wherein the energy and impact transformer layers are configured to protect against compression forces, shear forces, impact forces, and rotational forces, wherein the energy and impact transformer layers also include passive, semi-active, and active dampers," "wherein the outer shell has significantly more weight, strength, and structural integrity than the middle shell and inner shell layers," and "wherein the absorptive fluid or gel in either of the energy and impact layers comprises a smart fluid that undergoes changes in viscosity when a magnetic field is applied." Claim 5 has been amended to recite: "wherein the absorptive fluid or gel in either of the energy and impact transformer layers comprises a smart fluid that undergoes changes in viscosity when a magnetic field is applied." Support for the amendments can be found throughout the application, for example, at paragraph 0042, 0063, and 0065, and Figure 6 of the application as filed.

DOUBLE PATENTING REJECTIONS

In the Office Action, the Examiner rejected the claims on the grounds of nonstatutory double patenting. Should it be deemed necessary at the close of prosecution, Applicants will timely file all necessary terminal disclaimers.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C.103

In the Office Action, the Examiner rejected the claims as being unpatentable over Hawkins '755 in view of Hawkins '783 and Larry, in addition to various other references for some dependent claims. In response, Applicants have amended the claims as recited above. Applicants submit that none of the cited references teaches the amended features. For example, none of the references teach that the outer, middle, and inner shells are for protecting against penetrating forces while the energy and impact transformer layers are for protecting against compression, shear, and rotational forces. In addition, claim 1 has also been amended to recite "wherein the plurality of thin elastomeric trusses are comprised of material that absorbs and dissipates mechanical energy as thermal energy." Applicants submit that none of the references specifically mention the trusses being made of material that converts mechanical energy into thermal energy. Last, Applicants submit that none of the cited references teach that the outer shell layer has significantly more weight, strength, and structural integrity than the middle or inner shell layers. Thus, Applicants submit that the claims are patentable over the cited art. Therefore, Applicants respectfully request that the 35 U.S.C. §103(a) rejection of the claims be withdrawn.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No BRGDP002).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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

Electronic Acknowledgement Receipt

EFS ID:	34058419
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Kim Favinger
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	19-OCT-2018
Filing Date:	20-JUL-2012
Time Stamp:	17:53:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BRGDP002_Respons_filed_10-19-18.pdf	127233 69bf6ac60c50cfe66c02b98dea96c3710f0d8e33	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	7
Warnings:			
Information:			
	Total Files Size (in bytes):	127233	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert T. Knight	Atty Docket No.: BRGDP002
Application No.: 13/554,563	Examiner: Haden, Sally Cline
Filed: July 20, 2012	Art Unit: 3765
Title: ENERGY AND IMPACT TRANSFORMER LAYER	Confirmation: 9273

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 October 24, 2018.
Signed: /Kim Favinger/
Kim Favinger

Interview Summary

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

Applicants thank Examiner Sally Haden for her comments during a telephonic interview on October 23, 2018 with Applicants' representative. In the interview, the Examiner and Applicants' representative discussed the claims, the previously filed amendments, and the prior art references. The Examiner indicated that the amendments overcome the references but needed some slight clarification to avoid possible 112 issues. The Examiner proposed amendments to be entered into an Examiner's amendment and Applicants' representative agreed to have the Examiner enter the proposed amendments.

If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,
Kwan & Olynick LLP

Dated: October 24, 2018

/Joshua W. Chang/
Joshua W. Chang
Reg. 70,831

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Berkeley, CA 94702
(510) 900-9501
jchang@kwanip.com

Electronic Acknowledgement Receipt

EFS ID:	34107635
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Kim Favinger
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	24-OCT-2018
Filing Date:	20-JUL-2012
Time Stamp:	19:22:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant summary of interview with examiner	BRGDP002_Interview_Summary_filed_10-24-18.pdf	68424 f9d6495a9b84b8afdf7996c963fa3575d3acefc9	no	1

Warnings:

Information:	
Total Files Size (in bytes):	68424

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New Applications Under 35 U.S.C. 111

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

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

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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NOTICE OF ALLOWANCE AND FEE(S) DUE

19694 7590 11/05/2018

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

EXAMINER
HADEN, SALLY CLINE

ART UNIT	PAPER NUMBER
3732	

DATE MAILED: 11/05/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

TITLE OF INVENTION: ENERGY AND IMPACT TRANSFORMER LAYER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	02/05/2019

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

PART B - FEE(S) TRANSMITTAL

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

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence 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 11/05/2018
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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

TITLE OF INVENTION: ENERGY AND IMPACT TRANSFORMER LAYER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	02/05/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
HADEN, SALLY CLINE	3732	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 03-09 or more recent) attached. **Use of a Customer Number is required.**

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

1 _____
2 _____
3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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

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

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

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

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

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

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

19694 7590 11/05/2018

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

EXAMINER	
HADEN, SALLY CLINE	
ART UNIT	PAPER NUMBER
3732	

DATE MAILED: 11/05/2018

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. 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. 13/554,563	Applicant(s) Knight, Robert T.	
	Examiner SALLY HADEN	Art Unit 3732	AIA 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 applicant-initiated interview of 10/23/2018.
   ☐ 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 1,5 and 7-11 . 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 areply 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. 20181022.
5. ☑ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/SALLY HADEN/
Primary Examiner, Art Unit 3732

EXAMINER'S AMENDMENT

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

Authorization for this examiner's amendment was given in an interview with Joshua Chang on 23 October 2018.

The application has been amended as follows:

1. (Currently Amended) Protective gear, comprising:

a helmet, the helmet comprising:

an outer shell layer;

a middle shell layer;

an inner shell layer;

an outer energy and impact transformer layer connecting the outer shell layer to the middle shell layer, wherein the outer energy and impact transformer layer comprises a first plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the outer shell layer, wherein the outer energy and impact transformer layer allows the outer shell layer to rotate relative to the middle shell layer, wherein the first plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss of the first plurality of thin elastomeric

trusses diagonally connects the outer shell layer to the middle shell layer in a first direction and wherein each thin elastomeric truss of the first plurality of thin elastomeric trusses is parallel to adjacent thin elastomeric trusses of the first plurality of thin elastomeric trusses, wherein the outer energy and impact transformer layer is filled with an absorptive fluid or gel; and

an inner energy and impact transformer layer connecting the middle shell layer to the inner shell layer, wherein the inner energy and impact transformer layer comprises a second plurality of thin elastomeric trusses configured to absorb energy from mechanical forces imparted onto the middle shell layer, wherein the inner energy and impact transformer layer allows the middle shell layer to rotate relative to the inner shell layer, wherein the second plurality of thin elastomeric trusses are arranged such that each thin elastomeric truss of the second plurality of thin elastomeric trusses diagonally connects the middle shell layer to the inner shell layer in a second direction and wherein each thin elastomeric truss of the second plurality of thin elastomeric trusses is parallel to adjacent thin elastomeric trusses of the second plurality of thin elastomeric trusses, wherein the second direction is opposite to the first direction, wherein the inner energy and impact transformer layer is filled with an absorptive fluid or gel;

wherein the outer, middle, and inner shell layers are configured to protect against penetrating forces and are comprised of reinforcing

aramids and one or more of the following materials: plastics, resins, metal, and composites;

wherein the energy and impact transformer layers are configured to protect against compression forces, shear forces, impact forces, and rotational forces, wherein the energy and impact transformer layers also include passive, semi-active, and active dampers;

wherein the outer shell has [significantly] more weight, strength, and structural integrity than the middle shell and inner shell layers;

wherein the [plurality] first and second pluralities of thin elastomeric trusses are comprised of an elastomeric truss material that absorbs and dissipates mechanical energy as thermal energy, wherein the elastomeric truss material is different in composition from [the outer, middle, and inner shell layer materials] a material of the outer, middle, and inner shell layers.

Claims 2-4 are canceled.

5. (previously presented) The helmet of claim 1, wherein the absorptive fluid or gel in either of the energy and impact transformer layers comprises a smart fluid that undergoes changes in viscosity when a magnetic field is applied.

Claim 6 is canceled.

7. (Original) The helmet of claim 1, wherein the outer energy and impact transformer layer comprises a magneto-rheological element.

8. (Original) The helmet of claim 1, wherein mechanical forces include impact forces.

9. (Original) The helmet of claim 1, wherein mechanical forces include rotational and shear forces.

10. (Original) The helmet of claim 1, wherein a lining layer is connected to the inner shell layer, wherein the lining layer is configured to conform to a human head.

11. (Original) The helmet of claim 10, wherein the lining layer comprises foam.

Claims 12-20 are canceled.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALLY HADEN whose telephone number is (571)272-6731. The examiner can normally be reached on M-F 10-6.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Clinton Ostrup can be reached on 571-272-5559. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

SALLY HADEN
Primary Examiner
Art Unit 3732

/SALLY HADEN/
Primary Examiner, Art Unit 3732

Applicant-Initiated Interview Summary	Application No. 13/554,563	Applicant(s) Knight, Robert T.	
	Examiner SALLY HADEN	Art Unit 3732	AIA Status No

All participants (applicant, applicants representative, PTO personnel):

(1) SALLY HADEN. (3) _____.

(2) Joshua Chang. (4) _____.

Date of Interview: 23 October 2018.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1 and 5.

Identification of prior art discussed: n/a.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant and Examiner discussed the amendments that were filed on 10/19/2018. The amendments overcome the previous rejection as well as the cited prior art. Applicant and Examiner agreed to an Examiner's amendment of claim 1 that 1) clarifies to which of the first or second pluralities of thin elastomeric trusses each thin elastomeric truss belongs and 2) the materials claimed in the last paragraph. An Examiner's Amendment and Notice of Allowability are included with this interview summary..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

☐ Attachment

/SALLY HADEN/ Primary Examiner, Art Unit 3732	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/554,563	Knight, Robert T.
	Examiner	Art Unit
	SALLY HADEN	3732

CPC - Searched*		
Symbol	Date	Examiner
A42B3/063; A41D13/015; A42B3/04; A42B3/121; A42B3/125; A42B3/06 ; A42B3/064	10/15/15	ALH
Updated Search	04/28/16	ALH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
2	411, 425, 410	10/15/15	ALH
2	Updated Search	04/28/16	ALH

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

Search Notes		
Search Notes	Date	Examiner
EAST Search, see for details	10/15/15	ALH
updated - see attached	1/30/2017	sch
updated - see attached	7/6/2017	sch
updated - see attached	10/26/2018	sch

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
text	text	10/26/2018	sch

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/554,563	Knight, Robert T.
	Examiner	Art Unit
	SALLY HADEN	3732

CPC						
Symbol					Type	Version
A42B	/	3	/	064	F	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	/	063	I	2013-01-01
A42B	/	3	/	125	I	2013-01-01
A42B	/	3	/	08	I	2013-01-01
A42B	/	3	/	14	I	2013-01-01
A42B	/	3	/	20	I	2013-01-01
A42B	/	3	/	22	I	2013-01-01
A42C	/	2	/	007	I	2013-01-01

CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/SALLY HADEN/ Primary Examiner, Art Unit 3732	26 October 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5, 6

U.S. Patent and Trademark Office — Part of Paper No.: 20181022

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/554,563	Knight, Robert T.
	Examiner	**Art Unit**
	SALLY HADEN	3732

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A42B3/04	/	3	/	04
A42B3/06	/	3	/	06
A42B3/14	/	3	/	14
A41D13/015	/	13	/	015
	/		/	

NON-CLAIMED				
A42B3/08	/	3	/	08
A42B3/12	/	3	/	12
A42B3/20	/	3	/	20
A42B3/22	/	3	/	22
A42C2/00	/	2	/	00

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	7	
/SALLY HADEN/ Primary Examiner, Art Unit 3732	26 October 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5, 6

U.S. Patent and Trademark Office — Part of Paper No.: 20181022

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/554,563	Knight, Robert T.
	Examiner	**Art Unit**
	SALLY HADEN	3732

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	6	10		19										
	2	7	11		20										
	3		12												
	4		13												
2	5		14												
	6		15												
3	7		16												
4	8		17												
5	9		18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	7	
/SALLY HADEN/ Primary Examiner, Art Unit 3732	26 October 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5, 6

U.S. Patent and Trademark Office Part of Paper No.: 20181022

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/554,563	Knight, Robert T.
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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

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

CLAIM		DATE								
Final	Original	10/15/2015	04/28/2016	01/30/2017	07/06/2017	07/12/2018	10/26/2018			
1	1	✓	✓	✓	✓	✓	=			
	2	✓	-	-	-	-	-			
	3	N	N	N	N	N	-			
	4	✓	-	-	-	-	-			
2	5	✓	✓	✓	✓	✓	=			
	6	N	N	N	N	N	-			
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6	10	✓	✓	✓	✓	✓	=			
7	11	✓	✓	✓	✓	✓	=			
	12	N	N	N	N	N	-			
	13	N	N	N	N	N	-			
	14	N	N	N	N	N	-			
	15	N	N	N	N	N	-			
	16	N	N	N	N	N	-			
	17	N	N	N	N	N	-			
	18	N	N	N	N	N	-			
	19	N	N	N	N	N	-			
	20	N	N	N	N	N	-			

Bibliographic Data

Application No: 13/554,563

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /SALLY HADEN/ Examiner's Signature | Initials

Title: ENERGY AND IMPACT TRANSFORMER LAYER

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
07/20/2012	002	3732	BRGDP002
RULE			

APPLICANTS

INVENTORS

Robert T. Knight El Cerrito, CA, UNITED STATES

CONTINUING DATA

This application has PRO of 61510401 07/21/2011

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/31/2012

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

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

FILING FEE RECEIVED

$530

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1247	(a42b3/063.cpc. a41d13/015.cpc. a42b3/04.cpc. a42b3/121.cpc. a42b3/125.cpc. a42b3/06.cpc. a42b3/064.cpc. 2/411.ccls. 2/425.ccls. 2/410.ccls.) and @pd>"20170706"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2018/10/26 12:16
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S8	4	("2014/0013492").URPN.	USPAT	OR	ON	2017/01/30 12:15
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S10	594	(a42b3/063.cpc. a41d13/015.cpc. a42b3/04.cpc. a42b3/121.cpc. a42b3/125.cpc. a42b3/06.cpc. a42b3/064.cpc. 2/411.ccls. 2/425.ccls. 2/410.ccls.) and @pd>"20160428"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2017/01/30 13:26
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S12	8	S11 and (aramid paramid spectra kevlar)	US-PGPUB; USPAT; USOCR	OR	ON	2017/07/06 12:50
S13	362	(a42b3/063.cpc. a41d13/015.cpc. a42b3/04.cpc. a42b3/121.cpc. a42b3/125.cpc. a42b3/06.cpc. a42b3/064.cpc. 2/411.ccls. 2/425.ccls. 2/410.ccls.) and @pd>"20170130"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2017/07/06 13:09
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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	0	(protective gear helmet outer middle inner shell layer energy impact transformer plurality thin elastomeric truss).clm.	US-PGPUB; USPAT	AND	ON	2018/10/26 12:26

10/ 26/ 2018 12:26:43 PM
C:\ Users\ shaden\ Documents\ EAST\ Workspaces\ 13 554 563.wsp

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

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

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence 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)

13624 7990 11/05/2018

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Kim Favinger	(Typed or printed name)
/Kim Favinger/	(Signature)
February 05, 2019	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	07/20/2012	Robert T. Knight	BRGDP002	9273

TITLE OF INVENTION: ENERGY AND IMPACT TRANSFORMER LAYER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	02/05/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
HARON, SALLY CLINE	3732	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 03-09 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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

Brainguard Technologies, Inc. | 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. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies .....

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

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

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

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature: /Joshua W. Chang/ Date: February 05, 2019

Typed or printed name: Joshua W. Chang Registration No. 70,831

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13554563
Filing Date:	20-Jul-2012
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Filer:	Joshua Chang/Kim Favinger
Attorney Docket Number:	BRGDP002

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	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	35063952
Application Number:	13554563
International Application Number:	
Confirmation Number:	9273
Title of Invention:	ENERGY AND IMPACT TRANSFORMER LAYER
First Named Inventor/Applicant Name:	Robert T. Knight
Customer Number:	19694
Filer:	Joshua Chang/Kim Favinger
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	BRGDP002
Receipt Date:	05-FEB-2019
Filing Date:	20-JUL-2012
Time Stamp:	15:51:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$500
RAM confirmation Number	020619INTEFSW15523100
Deposit Account	506367
Authorized User	Kim Favinger

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

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	BRGDP002_Issue_Fee_filed_02-05-19.pdf	91985 6a16e4143329938e5a0b50d0df495adf14d201db	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30251 5cd68ba7052d6581eec08f63161a3996e6b5f7c2	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	122236		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/554,563	03/26/2019	10238162	BRGDP002	9273

19694 7590 03/06/2019

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 1139 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, El Cerrito, CA;

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