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Declarations under Rule 4.17:

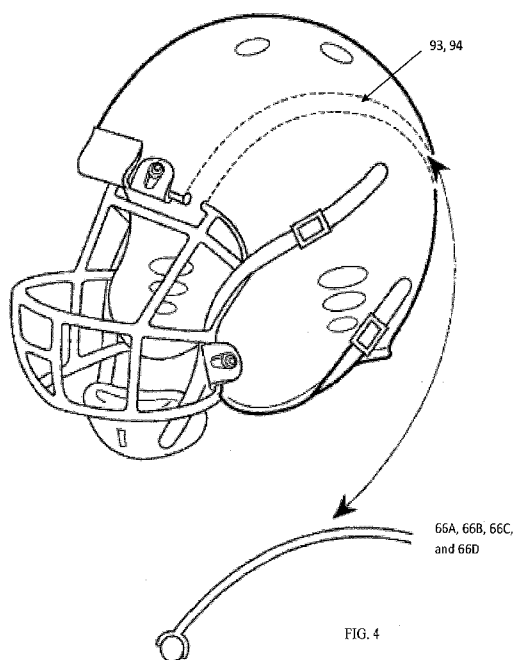
— of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))
- with information concerning incorporation by reference of
missing parts and/or elements (Rule 20.6)

[Continued on next page]

(54) Title: ENHANCED RECOIL ATTENUATING SAFETY HELMET



(57) Abstract: A reinforced and impact attenuating helmet comprising a shell configured to receive a head of a wearer of the helmet, the shell comprising an outer surface and an inner surface; a series of linked coils; filler material; wherein the series of linked coils are entirely encased within the filler material to form a reinforcement layer, the reinforcement layer having a first surface and an opposing surface, the first surface of the reinforcement layer generally facing toward the inner surface of the shell, the reinforcement layer being located proximate the inner surface of the shell, forming a basic helmet assembly.



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27 March 2014

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/045271

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A42B 3/06 (2014.01)

USPC - 2/414

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(8) - A41D 13/00, 13/015; A42B 3/06, 3/12 (2014.01)

USPC - 2/411, 412, 414, 424, 425; 267/140.3, 147, 168

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

CPC - A42B 3/063, 3/064 (2014.01)

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

PatBase, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,739,309 A (FRIEDER et al) 27 March 1956 (27.03.1956) entire document	22-24, 46
Y		25-31, 45
Y	US 6,219,850 B1 (HALSTEAD et al) 24 April 2001 (24.04.2001) entire document	1, 45
Y	US 7,971,281 B2 (IMAI et al) 05 July 2011 (05.07.2011) entire document	1, 45
Y	US 4,233,687 A (LANCELOTTI) 18 November 1980 (18.11.1980) entire document	25-31
Y	US 5,101,517 A (DOUGLAS) 07 April 1992 (07.04.1992) entire document	26-31
Y	US 2012/0036620 A1 (HARRIS) 16 February 2012 (16.02.2012) entire document	27-29
A	JP 9-105014 A (KIMURA) 22 April 1997 (22.04.1997) see machine translation	1-33, 45, 46
A	US 4,343,047 A (LAZOWSKI et al) 10 August 1982 (10.08.1982) entire document	1-33, 45, 46

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

13/045271 17.01.2014

International application No.

PCT/US2013/045271

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

(See Continuation Sheet Attached)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
claims 1-33, 45, 46

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

12/04/2014 17:04:2014

International application No.

PCT/US2013/045271

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1: In order for all inventions to be examined, the appropriate additional examination fees need to be paid.

Group I, claims 1-33, 45, 46 are drawn to a helmet comprising a series of coiled links / mesh or weave.
Group II, claims 34-44, 47 are drawn to a helmet comprising a face guard.

The inventions listed in Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2 they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I, a helmet comprising a series of linked coils / mesh or weave, a filler material, wherein the series of linked coils / mesh or weave are entirely encased within the filler material to form a reinforcement layer are not present in Group II; and the special technical features of Group II, a helmet comprising a face guard, wherein the face guard has at least one flexible connecting rod, and wherein the helmet assembly comprises at least one curved receiving channel, are not present in Group I.

Groups I and II share the technical features of a reinforced and impact attenuating helmet comprising a shell configured to receive a head of a wearer of the helmet, the shell comprising an outer surface and an inner surface to form a basic helmet assembly. However, these shared technical features do not represent a contribution over the prior art. Specifically, US 2005/0273911 A1 to Skiba et al. teaches of a reinforced and impact attenuating helmet (10, figures 1A-1B) comprising a shell (molded shell 11 of the helmet, figures 1A-1B; paragraph [0047]) configured to receive a head of a wearer of the helmet (protects the wearer when worn during blocking and tackling events, figures 1A-1B; abstract), the shell comprising an outer surface and an inner surface to form a basic helmet assembly (outer and inner surface of molded shell 11, figures 1A-1B; paragraph [0047]).

Since none of the special technical features of the Group I and II inventions are found in more than one of the inventions, unity is lacking.