



(51) International Patent Classification:

B05D 5/08 (2006.01) *F42B 14/02* (2006.01)
B32B 3/02 (2006.01) *F42B 30/02* (2006.01)
F42B 10/02 (2006.01)

(21) International Application Number:

PCT/US2015/024403

(22) International Filing Date:

5 April 2015 (05.04.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/976,248 7 April 2014 (07.04.2014) US

(71) Applicant: **EINSTEIN NOODLES, LLC** [US/US]; 126 Seven Farms Drive, Suite 110, Charleston, SC 29492 (US).

(72) Inventors: **SEEMAN, Daniel, Jonathan**; 12049 Windy Rock Way, Charlotte, NC 28273 (US). **PRIVETTE, Dewey, R.**; 1010 James Street, Charlotte, NC 28216 (US).

(74) Agents: **BRODER, James P.** et al.; Roeder & Broder LLP, 9915 Mira Mesa Blvd., Ste. 300, San Diego, California 92131 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,

BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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))

(88) Date of publication of the international search report:

7 April 2016



WO 2015/199786 A3

(54) Title: PROVIDING SPIN TO COMPOSITE PROJECTILE

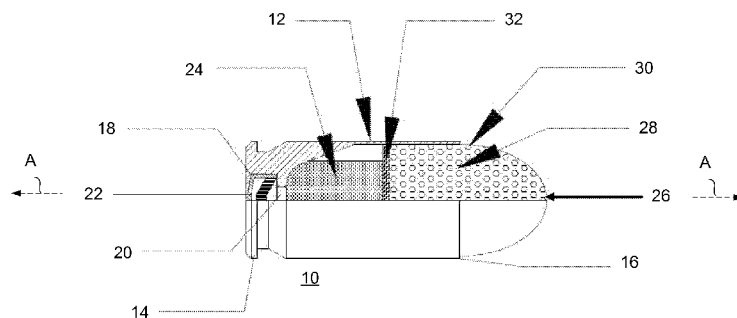


FIG. 1

(57) Abstract: A projectile includes a body preferably in the shape of a bullet and having a density less than the density of lead. The projectile further includes a stabilizer adhered to the body. The stabilizer is configured to engage rifling of a barrel of a firearm and impart rotation to the projectile as the projectile travels through the barrel. A preferred ammunition cartridge includes a primer, a propellant, and the aforesaid projectile, as well as a casing containing the primer, propellant and projectile, with the projectile projecting from the casing. Other projectiles in accordance with aspects and features of the invention further are disclosed.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 15/24403

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B05D 5/08, B32B 3/02, F42B 10/02, F42B 14/02, F42B 30/02 (2016.01) CPC - B05D 5/08, B32B 3/02, B32B 2307/746, B32B 2255/24, F42B 10/02, F42B 14/02, F42B 30/02 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)- B05D 5/08, B32B 3/02, F42B 10/02, F42B 14/02, F42B 30/02 (2016.01); CPC- B05D 5/08, B32B 3/02, B32B 2307/746, B32B 2255/24, F42B 10/02, F42B 14/02, F42B 30/02 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC- 42/106, 102/385, 102/502, 102/514, 102/515, 102/516, 102/517, 102/526, 102/527, 428/402, 428/542.8, 523/175; Patents and NPL (classification, keyword; search terms below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Pub West (US EP JP WO), Pat Base (AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO), Google Patent, Google Scholar, Free Patents Online; search terms: bullet, projectile, ammunition, munition, artillery, rotate, spin, rifling, stabilize, reinforce, guide, driving, band, cuff, ring, bond, annular, thermoset, thermoplastic...		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- A	US 2012/0291655 A1 (JONES) 22 November 2012 (22.11.2012), Fig. 7; para [0010], [0074], [0078], [0082]	1, 8 ----- 16-59
X -- Y -- A	US 2007/0289475 A1 (KAPELES) 20 December 2007 (20.12.2007), Fig. 1; para [0009], [0015], [0016], [0020]	1, 2, 5, 6, 8, 11 ----- 3-4, 7, 9, 10 ----- 16-59
Y -- A	US 2014/0083320 A1 (STROMBERG et al.) 27 March 2014 (27.03.2014), Figs. 2, 3; para [0006], [0017]-[0019], [0023], [0024], [0029]	3-4, 7, 12-15 ----- 16-59
Y -- A	GB 13,429 A (GREENER) 02 June 1915 (02.06.1915), pg 1, ln 27-37; pg 2, ln 42-47; pg 4, ln 41-48	9, 10 ----- 16-59
Y -- A	US 3,760,736 A (EIG) 25 September 1973 (25.09.1973), col 1, ln 57-67; col 2, ln 5-60; col 3, ln 60 to col 4, ln 4	12-15 ----- 16-59
Y -- A	US 5,786,416 A (GARDNER et al.) 28 July 1998 (28.07.1998), col 1, ln 51-63; col 3, ln 15-18; col 3, ln 30-43; col 5, ln 6-14	14, 15 ----- 16-59
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* 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 15 January 2016		Date of mailing of the international search report 02 FEB 2016
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-1114

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 15/24403

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:

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 must be paid.

Group I: Claims 1-59 directed to a projectile for a firearm.

Group II: Claims 60-81 directed to a method of making a projectile for an ammunition cartridge for a firearm.

-- Please See Supplemental Box --

- 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.:
1-59

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

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Continued from Box No. III, Observations where unity of invention is lacking.

The inventions listed as Groups I-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:

SPECIAL TECHNICAL FEATURES

The invention of Group II includes the special technical features of method steps for making a projectile for an ammunition cartridge for a firearm, including bonding a stabilizer to a body of bullet, the step of placing the stabilizer in a mold during the molding process, the step of adhering the stabilizer to the body after removing the bullet from the mold, and the step of introducing a mixture into a projectile mold, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

The inventions of Groups I-II share the technical features of a projectile for a firearm, comprising: a polymer bullet; and a stabilizer bonded to the polymer bullet and configured to engage rifling of a barrel of a firearm and impart rotation to the polymer bullet as the polymer bullet travels through the barrel. Specifically, Groups I and II are related as an apparatus (Group I) and methods for making the apparatus (Group II). The apparatus is known in prior art as shown in US 2012/0291655 A1 (Jones). Therefore, Groups I and II lack unity since the shared technical features do not represent a contribution over Jones:

Regarding claim 1, Jones discloses a projectile (1, Fig. 3; para[0070], 'a spin stabilized, blunt impact, non-lethal projectile 1') for a firearm (Fig. 3; para[0070], 'capable of being fired from conventional weapons, such as an M1002 or MK19'), comprising: a polymer bullet (1, 7, Fig. 3, 9 - see bullet 1 and how it's a polymeric bullet comprising the compressible body 7, windscreen 3 and base cap 5; para[0074], 'the foam, rubber, ect. which makes up to the compressible body 7'; para[0070] - see how the windscreen 3 and base cap 5 are also made out of polymers); and a stabilizer (11, Fig. 3, 9 - see stabilizer ring positioned on the back end of bullet 1; para[0078], 'a rotating band 11') bonded to the polymer bullet (Fig. 3, 9 - see how the band 11 is integral with the base cap 5 which is bonded to the bullet 1) and configured to engage rifling of a barrel (Fig. 11 - see rifling of the barrel) of a firearm (Fig. 11 - see how the stabilizer ring 11 is configured to engage the rifling of the barrel of the firearm; para[0078], 'the rotating band 11 is operable to communicate with the barrel rifling, i.e., for rifling engagement') and impart rotation to the polymer bullet as the polymer bullet travels through the barrel (Fig. 11; para[0078], 'thereby enabling/increasing the spin of the projectile 1 after firing').

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.