

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
05 January 2023 (05.01.2023)



(10) International Publication Number
WO 2023/277816 A3

(51) International Patent Classification:
F42C 15/00 (2006.01)

(21) International Application Number:
PCT/SG2022/050453

(22) International Filing Date:
29 June 2022 (29.06.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10202107146V 29 June 2021 (29.06.2021) SG

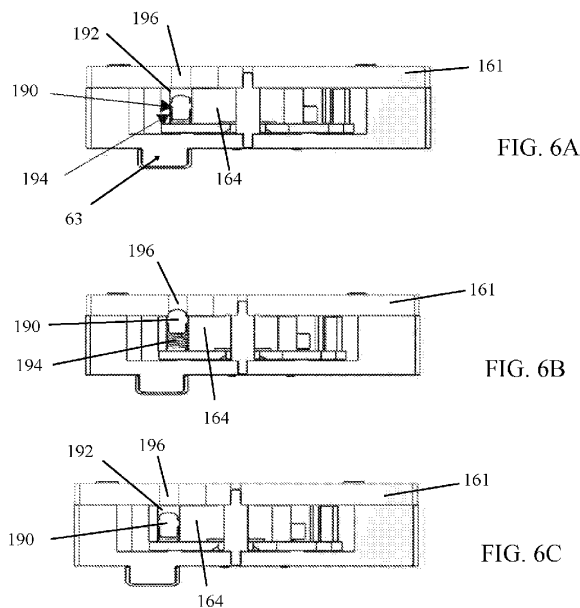
(71) Applicant: **ST ENGINEERING ADVANCED
MATERIAL ENGINEERING PTE. LTD.** [SG/SG]; 249
Jalan Boon Lay, Singapore 619523 (SG).

(72) Inventors: **TAN, Yong Peng**; Block 624, Jurong West
Street 61, #10-133, Singapore 640624 (SG). **SIE, Soo
Chew**; Blk 194B, Bukit Batok West Ave 6, #29-237, Singa-
pore 652194 (SG). **HUANG, Siwei**; Blk 433, Jurong West
St 42, #07-158, Singapore 640433 (SG).

(74) Agent: **PINTAS-IPHOUSE PTE LTD**; 151 Chin Swee
Road, #12-14 Manhattan House, Singapore 169876 (SG).

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

(54) Title: SAFE-AND-ARM DEVICE



(57) Abstract: The present invention describes a safe-and-arm device, mechanism or assembly (160) for a projectile (100, 102) equipped with a second-stage propellant (124). The second-stage propellant (124) is ignited after the projectile has been ejected out from a launcher barrel. A lockpin (190), being urged by a spring (194), is responsive to ignition of the second-stage propellant; after the lockpin (190) and spring (194) sense and respond to the second propulsion, an unbalanced rotor (164) forming part of the safe-and-arm device or assembly (160), is released to rotate from a "safe" state to an "armed" state, as the projectile continues traveling along its trajectory to a target. In one embodiment, the projectile is configured with a 40mm cartridge containing a first propellant (122). An impact sensor may trigger an electric detonator or a point detonator may trigger a stab detonator to set off explosives disposed in the projectile.

[Continued on next page]

TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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).

Declarations under Rule 4.17:

- *as to the identity of the inventor (Rule 4.17(i))*
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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:

02 March 2023 (02.03.2023)