

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 July 2024 (25.07.2024)



(10) International Publication Number
WO 2024/155833 A1

(51) International Patent Classification:

B63B 21/04 (2006.01) *B63B 22/04* (2006.01)
B63B 21/50 (2006.01) *F16C 11/04* (2006.01)

(21) International Application Number:

PCT/US2024/012046

(22) International Filing Date:

18 January 2024 (18.01.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/439,949 19 January 2023 (19.01.2023) US

(71) Applicant: **SOFEC, INC.** [—/US]; 15011 Katy Freeway,
Suite 500, Houston, TX 77058 (US).

(72) Inventor: **DANG, Quoc, Anh**; 17318 Hill Lakes Ct., Cy-
press, TX 77429 (US).

(74) Agent: **EDMONDS, Robb, D.** et al.; Edmonds & Cmaidal-
ka, 16850 Diana Lane, Ste. 102, Houston, TX 77058 (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, CV, 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, MG, MK, MN, MU, 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, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

(54) Title: MECHANICAL JOINTS AND PROCESS FOR USING SAME

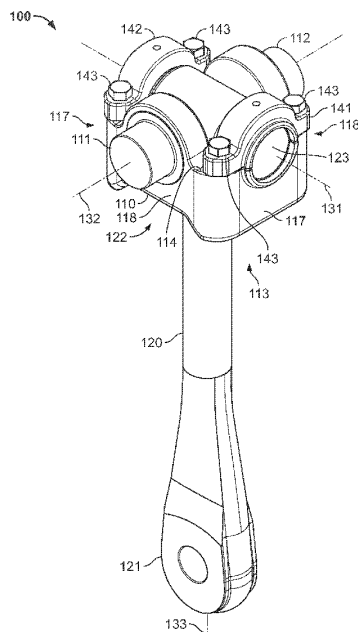


FIG. 1

(57) Abstract: Mechanical joints and processes for using same. The mechanical joint can include a gimbal table that can define a first and second bearing surface and include a first and second trunnion extending from a pair of opposing sides. The arm can include a third and fourth trunnion disposed toward a second end thereof. The third and fourth trunnion can be aligned along a first axis and the first and second trunnion can be aligned along a second axis. The first and second axes can be substantially orthogonal or substantially perpendicular to one another. The third trunnion and the first bearing surface and the fourth trunnion and the second bearing surface, respectively, can be engaged with one another. The arm can be rotatable relative to the gimbal table about the first axis, and at least a portion of the arm can be disposed through an aperture defined by the gimbal table.

[Continued on next page]

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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))*

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))*