

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
07 October 2021 (07.10.2021)



(10) International Publication Number
WO 2021/202024 A1

- (51) International Patent Classification:
B01F 5/04 (2006.01) *B01J 19/00* (2006.01)
B01F 5/06 (2006.01)
- (21) International Application Number:
PCT/US2021/020224
- (22) International Filing Date:
01 March 2021 (01.03.2021)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
16/836,346 31 March 2020 (31.03.2020) US
16/933,304 20 July 2020 (20.07.2020) US
- (71) Applicant: **KD ENTERPRISES LLC** [US/US]; 4348 Waialae Avenue, Unit 315, Honolulu, Hawaii 96816-5767 (US).
- (72) Inventor: **MORRILL, Keith A.**; 4348 Waialae Avenue, Unit 315, Honolulu, Hawaii 96816-5767 (US).
- (74) Agent: **PILAUD, Robert**; One Financial Center, Boston, Massachusetts 02110 (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, 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,

(54) Title: HYDRODYNAMIC CAVITATION DEVICE AND METHODS OF MANUFACTURING THE SAME

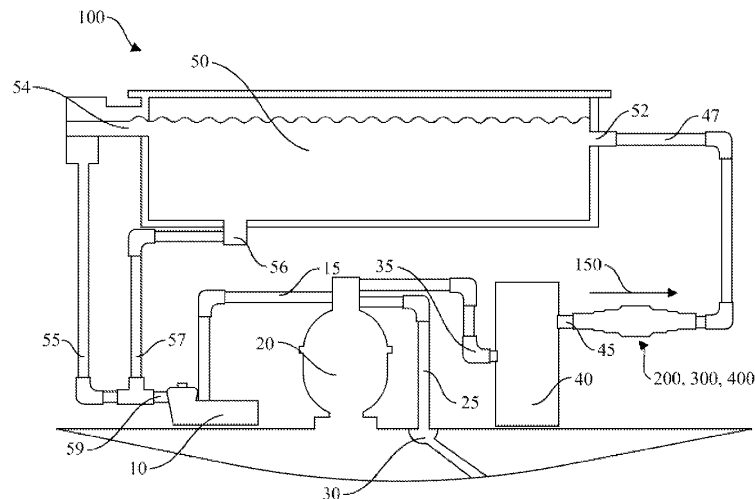


FIG. 1

(57) Abstract: A hydrodynamic cavitation unit for a hydrodynamic cavitation device is provided. The device is configured for fluid communication with an inlet conduit and an outlet conduit. The unit includes a body; and a plurality of lumens. Each of the lumens is configured for fluid communication from the inlet conduit, through the body, and to the outlet conduit. A ratio of a total cross-sectional area of the lumens to a cross-sectional area of the inlet conduit is about 1:1. A ratio of a cross-sectional area of the unit to the cross-sectional area of the inlet conduit is about 4:1. Each of the lumens may have a frustoconical or Venturi shape. The device may include a vortex unit, a cap, and/or a second hydrodynamic cavitation unit in a fluid passageway between the inlet and outlet conduits. A catalyst is not required. Related apparatuses, systems, techniques, and articles are also described.

[Continued on next page]

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.

(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))