



(51) International Patent Classification:

E21B 43/12 (2006.01) *F16K 31/122* (2006.01)
E21B 34/08 (2006.01) *F16K 31/126* (2006.01)
F04F 1/20 (2006.01)

(21) International Application Number:

PCT/US2022/022274

(22) International Filing Date:

29 March 2022 (29.03.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/167,297 29 March 2021 (29.03.2021) US

(71) Applicant: **SAM AND GAIL LLC** [US/US]; 26860 Iron Squire Drive, Kingwood, TX 77339 (US).

(72) Inventors: **WILDMAN, SR., Samuel, Levern**; 26860 Iron Squire Drive, Kingwood, TX 77339 (US). **WILDMAN, William, Durell**; 4335 Courageous Circle, Cincinnati, OH 45252 (US). **WILDMAN, Maxwell, Ryan**; 26860 Iron Squire Drive, Kingwood, TX 77339 (US).

(74) Agent: **BLAUFUSS, James, R.** et al.; Woodard, Emhardt, Henry, Reeves & Wagner, LLP, 111 Monument Circle, Suite 3700, Indianapolis, IN 46204 (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, 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, 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,

(54) Title: GAS LIFT SYSTEM AND METHOD

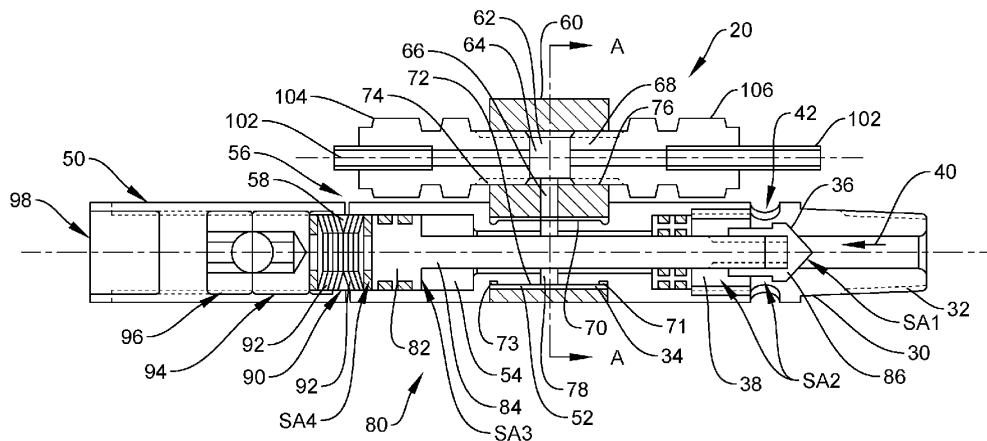


FIG. 4

(57) Abstract: A gas lift system for lifting oil with a production tube positioned inside a well casing with manifolds in the production tube spaced apart from each other; the system including valve assemblies on the manifolds that each have an open position and a closed position, each of the valve assemblies including a biasing device that biases the valve towards the closed position, where pressurizing each valve assembly with a control fluid generates a force that acts against the biasing force of the biasing device to open the valve, and a means to selectively control the pressure of the control fluid in the control line, where each of the valve assemblies includes different biasing forces in each valve, with a topmost valve having a highest biasing force and each sequentially lower valve having a lower biasing force. A method for using the gas lift system is also included.

[Continued on next page]

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 applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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))*