



(51) International Patent Classification:
F16K 1/18 (2006.01) *F16K 17/04* (2006.01)

(21) International Application Number:
PCT/US2011/045205

(22) International Filing Date:
25 July 2011 (25.07.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/845,510 28 July 2010 (28.07.2010) US

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(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, 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, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, 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, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, 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:

- without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) Title: PRESSURE VORTEX DEVICE TO ALLOW FLAPPER CLOSURE IN HIGH VELOCITY FLUID APPLICATIONS

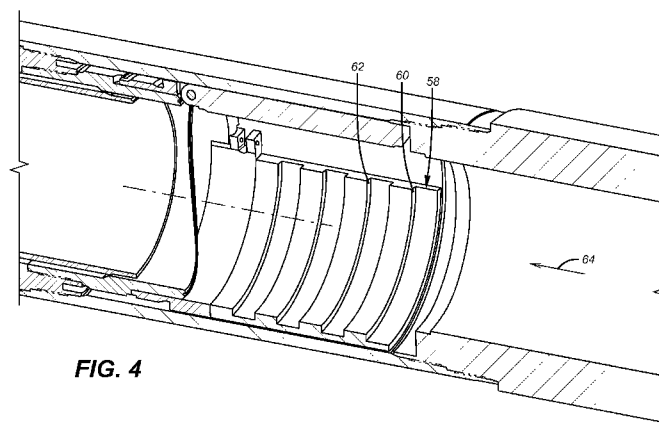


FIG. 4

(57) Abstract: The problem of flappers that will not close due to high velocity gas rushing past and creating a vortex that has zones of high pressure pressing the flapper against the force of the torsion spring is reduced or overcome with modifications in the passage through a subsurface safety valve so as to reduce the intensity of the vortex to allow the torsion spring to pivot the flapper to closed position. Various shapes are inserted adjacent the flapper base to create turbulence to minimize or prevent the vortex and the associated pressure increases that would otherwise prevent flapper closure with the flow tube retracted. Inserts that create turbulence are placed in a recess that in part holds the flapper when it is rotated to the open position.

