

SEARCH HISTORY

Application Number	PCT/US 20/30781
Search Conducted By	RD
Search Approved By	SCL

CPC/IPC Classifications Searched	<p>IPC (8) F16K 17/00, F16K 1/00, F16K 7/00, F16K 15/00, F16K 31/00, F15B 20/00 (2020.01)</p> <p>CPC: F16K 17/00, F16K 17/003, F16K 17/02, F16K 17/04, F16K 17/0473, F16K 17/048, F16K 17/10, F16K 17/36, F16K 1/00, F16K 1/30, F16K 1/301, F16K 1/304, F16K 1/307, F16K 1/34, F16K 7/00, F16K 7/12, F16K 7/123, F16K 7/14, F16K 7/17, F16K 15/00, F16K 15/02, F16K 15/025, F16K 15/06, F16K 15/063, F16K 15/14, F16K 15/144, F16K 15/18, F16K 15/185, F16K 15/186, F16K 31/00, F16K 31/003, F16K 31/02, F16K 31/06, F16K 31/0603, F16K 31/0606, F16K 31/0624, F16K 31/12, F16K 31/122, F16K 31/1221, F16K 31/1223, F16K 31/126, F16K 31/1266, F16K 31/16, F16K 31/163, F16K 31/165, F16K 31/36, F16K 31/363, F16K 31/365, F16K 31/38, F16K 31/383, F16K 31/385, F16K 31/3855, F15B 19/005, F15B 20/00, F15B 20/004, F15B 20/005</p>
Date Conducted	01 July 2020 (01.07.2020)

Documentation Searched	<p>IPC (8) F16K 17/00, F16K 1/00, F16K 7/00, F16K 15/00, F16K 31/00, F15B 20/00 (2020.01)</p> <p>CPC: F16K 17/00, F16K 17/003, F16K 17/02, F16K 17/04, F16K 17/0473, F16K 17/048, F16K 17/10, F16K 17/36, F16K 1/00, F16K 1/30, F16K 1/301, F16K 1/304, F16K 1/307, F16K 1/34, F16K 7/00, F16K 7/12, F16K 7/123, F16K 7/14, F16K 7/17, F16K 15/00, F16K 15/02, F16K 15/025, F16K 15/06, F16K 15/063, F16K 15/14, F16K 15/144, F16K 15/18, F16K 15/185, F16K 15/186, F16K 31/00, F16K 31/003, F16K 31/02, F16K 31/06, F16K 31/0603, F16K 31/0606, F16K 31/0624, F16K 31/12, F16K 31/122, F16K 31/1221, F16K 31/1223, F16K 31/126, F16K 31/1266, F16K 31/16, F16K 31/163, F16K 31/165, F16K 31/36, F16K 31/363, F16K 31/365, F16K 31/38, F16K 31/383, F16K 31/385, F16K 31/3855, F15B 19/005, F15B 20/00, F15B 20/004, F15B 20/005</p>
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Search Terms Used	Valve% Solenoid Electromagnet EM Electr* Magnet* Pressur* Shut* Stop* Close~ Leak~ Low Gas Gasses Fluid% Air Sens* Monitor* Detect* Measur* Signal~ Control~ Flow*
Date Conducted	01 July 2020 (01.07.2020)

Electronic Database Searched	PatBase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (European) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	01 July 2020 (01.07.2020)

Search Logic:

- Search 1: PA=(Engineered Controls International) (Results 5)
Search 2: PA=(Engineered Controls) (Results 40)
Search 3: 1 OR 2 (Results 40)
Search 4: 3 AND TAC=(valve%) (Results 28)
Search 5: 4 AND FT=(solenoid OR electromagnet* OR "EM" OR ((electr* OR magnet*) W3 valve%)) (Results 3)
Search 6: INV=(Hamm Mark) (Results 58)
Search 7: INV=(Herman Christopher) (Results 23)
Search 8: INV=(Combs Elijah) (Results 0)
Search 9: 6 OR 7 (Results 80)
Search 10: 9 AND TAC=(valve% AND pressur*) (Results 15)
Search 11: INV=(McDonough Thomas) (Results 39)
Search 12: 11 AND TAC=(valve% AND pressur*) (Results 2)
Search 13: TAC=(valve% AND pressur* AND (solenoid OR electromagnet*)) (Results 151226)
Search 14: 13 AND TAC=(((shut* OR stop*) NEAR valve%) AND (leak~ OR (low W5 pressure))) (Results 2165)
Search 15: 14 AND SP=((gas OR gasses OR fluid% OR air) AND (sens* OR monitor* OR detect* OR measur*)) (Results 1018)
Search 15: 14 AND TAC=((gas OR gasses OR fluid% OR air) NEAR (sens* OR monitor* OR detect* OR measur*)) (Results 277)
Search 16: 15 AND TAC=(signal~ OR control~) (Results 265)
Search 17: 16 AND SP=(((shut* OR stop*) NEAR (valve% OR flow*)) AND (leak~ OR (low W5 pressure))) (Results 179)
Search 18: PN=(EP1676067) (Results 1)

- Search 19: PN=(CN210637515 U OR WO19061071A OR WO18233530) (Results 2)
Search 20: PN=(CN210637515 U OR WO19061071 OR WO18233530) (Results 3)
Search 21: PN=(US2010224804 OR US2009236904 OR US5090436 OR GB2359891) (Results 4)
Search 22: PN=(US2012310582 OR US8074512) (Results 1)
Search 23: PN=(US2004094735 OR US8172197) (Results 2)
Search 24: PN=(US8653979 OR US6067022 OR US5540558) (Results 3)
Search 25: CPC=(F16K1/00 OR F16K1/30 OR F16K1/301 OR F16K1/304 OR F16K1/307 OR F16K1/34 OR F16K7/00 OR F16K7/12 OR F16K7/123 OR F16K7/14 OR F16K7/17 OR F16K15/00 OR F16K15/02 OR F16K15/025 OR F16K15/06 OR F16K15/063 OR F16K15/14 OR F16K15/144 OR F16K15/18 OR F16K15/185 OR F16K15/186 OR F16K17/00 OR F16K17/003 OR F16K17/02 OR F16K17/04 OR F16K17/0473 OR F16K17/048 OR F16K17/10 OR F16K17/36 OR F16K31/00 OR F16K31/003 OR F16K31/02 OR F16K31/06 OR F16K31/0603 OR F16K31/0606 OR F16K31/0624 OR F16K31/12 OR F16K31/122 OR F16K31/1221 OR F16K31/1223 OR F16K31/126 OR F16K31/1266 OR F16K31/16 OR F16K31/163 OR F16K31/165 OR F16K31/36 OR F16K31/363 OR F16K31/365 OR F16K31/38 OR F16K31/383 OR F16K31/385 OR F16K31/3855 OR F15B19/005 OR F15B20/00 OR F15B20/004 OR F15B20/005) (Results 36636)
Search 26: 25 AND TAC=(valve% AND pressur* AND (solenoid OR electromagnet*)) (Results 2586)
Search 27: 26 AND TAC=((((shut* OR stop*) NEAR valve%) AND (leak~ OR (low W5 pressure)))) (Results 77)
Search 28: 26 AND FT=((((shut* OR stop*) NEAR valve%) AND (leak~ OR (low W5 pressure)))) (Results 369)
Search 29: 28 AND FT=((gas OR gasses OR fluid% OR air) NEAR (sens* OR monitor* OR detect* OR measur*)) (Results 93)
Search 30: 29 AND FT=(signal~ OR control~) (Results 92)
Search 31: 30 AND SP=((((shut* OR stop*) NEAR (valve% OR flow*)) AND (leak~ OR (low W5 pressure)))) (Results 41)
Search 32: 26 AND FT=((((shut* OR stop* OR close~) NEAR valve%) AND (leak~ OR (low W5 pressure)))) (Results 748)
Search 33: 32 AND FT=((gas OR gasses OR fluid% OR air) NEAR (sens* OR monitor* OR detect* OR measur*)) (Results 174)
Search 34: 33 AND FT=(signal~ OR control~) (Results 173)
Search 35: 34 AND SP=((((shut* OR stop* OR close~) NEAR (valve% OR flow*)) AND (leak~ OR (low W5 pressure)))) (Results 101)
Search 36: 35 NOT 17 (Results 88)
Search 36: 35 NOT 17 (Results 88)
Search 37: PN=(US2010224804 OR US2009236904 OR US5090436 OR GB2359891 OR US2015168246 OR US2004094735 OR US8172197 OR CA2268861) (Results 8)
Search 38: CTB 37 OR CTF 37 (Results 383)
Search 39: 38 AND TAC=(valve% AND pressur* AND (solenoid OR electromagnet*)) (Results 62)
Search 40: 39 AND FT=((((shut* OR stop* OR close~) NEAR valve%) AND (leak~ OR (low W5 pressure)))) (Results 29)
Search 41: 40 AND FT=((gas OR gasses OR fluid% OR air) NEAR (sens* OR monitor* OR detect* OR measur*)) (Results 14)
Search 42: 41 AND FT=(signal~ OR control~) (Results 14)
Search 43: 42 NOT (17 OR 35) (Results 6)

Search 44: PN=(US2010224804 OR US2009236904 OR US5090436 OR GB2359891) (Results 4)

Search 45: PN=(US2015168246 OR US2012325322 OR US2004094735 OR US8172197 OR CA2268861) (Results 5)

Electronic Database Searched	Google
Files Searched	Google Patents
Date Conducted	01 July 2020 (01.07.2020)
Search Logic:	

Pressurized-gas low-pressure detection and shut-off system
About 155,000 results

Low-pressure gas shut-off valve
About 330,000 results

Low-pressure gas shut-off valve and solenoid system
About 126,000 results

Low-pressure detection gas shut-off valve solenoid control
About 85,800 results

Low-pressure gas shut-off valve and 3-way solenoid valve system
About 128,000 results

Gas leak detection shut-off valve and 3-way solenoid valve system
About 38,000 results

Pneumatic diaphragm valve
About 79,400 results

Electronic Database Searched	Google
Files Searched	Google Web
Date Conducted	01 July 2020 (01.07.2020)
Search Logic:	

Engineered controls international
About 63,300,000 results

Engineered controls international low pressure valve
About 5,950,000 results

Rego low pressure valve
About 301,000 results

Low-pressure shut-off valve
About 44,200,000 results

Low-pressure shut-off gas valve
About 161,000,000 results

Low-pressure shut-off gas valve solenoid control
About 15,100,000 results

Gas shut-off valve and solenoid valve system
About 46,000,000 results

Diaphragm valve low-pressure shut-off
About 6,070,000 results

Three way diaphragm valve
About 6,800,000 results

Pneumatic diaphragm valve
About 5,930,000 results