



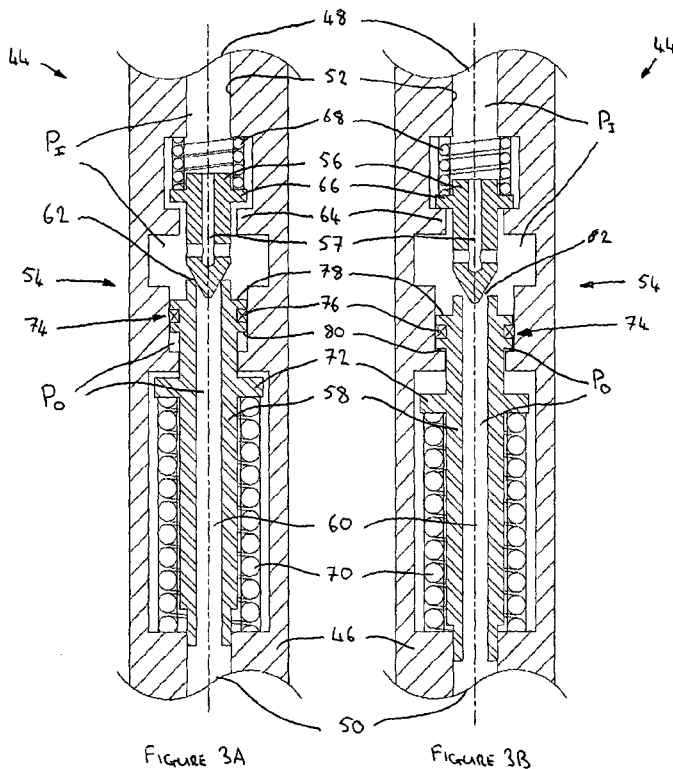
- (51) International Patent Classification:
E21B 43/25 (2006.01) F16K 17/04 (2006.01)
- (21) International Application Number:
PCT/GB2012/000326
- (22) International Filing Date:
5 April 2012 (05.04.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
1105873.2 7 April 2011 (07.04.2011) GB
- (71) Applicant (for all designated States except US): TCO AS
[NO/NO]; Storanaset 20, Postboks 23, Indre Ama, N-5888
Bergen (NO).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): WOODFORD, Keith
Donald [GB/GB]; 162D Queens Road, Aberdeen AB15
6WF (GB).
- (74) Agent: DOCHERTY, Andrew; Marks & Clerk LLP, Au-
rora, 120 Bothwell Street, Glasgow G2 7JS (GB).

- (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, QA, RO, RS, RU, RW, 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, RW, 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).

Published:
— with international search report (Art. 21(3))

[Continued on next page]

(54) Title: INJECTION DEVICE



(57) Abstract: An injection device for use in injecting a fluid into a target location comprises a housing and a valve assembly located within the housing. The housing defines an inlet for communicating with an injection line, an outlet for communicating with a target location, and an injection fluid flow path extending between the inlet and outlet. The valve assembly located is configured to control the flow of injection fluid along the flow path and comprises first and second valve members both arranged to move within the housing, wherein in an open configuration to permit flow the first and second members are disengaged, and in a closed configuration to prevent flow the first and second members are engaged and the first valve member is biased against the second member by inlet fluid pressure to assist sealing therebetween.

— *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))*

(88) Date of publication of the international search report:
18 April 2013

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2012/000326

A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B43/25 F16K17/04
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E21B F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 103 853 A2 (BOSCH GMBH ROBERT [DE]) 23 September 2009 (2009-09-23) the whole document	1-13, 16-29, 31, 33-35, 45-51
X	US 2 591 528 A (FILSTRUP JR EDWARD C) 1 April 1952 (1952-04-01) the whole document	1-20,23, 26,27, 29-31, 45-48
X	GB 2 279 725 A (PALL CORP [US]) 11 January 1995 (1995-01-11) the whole document	52
A		40
	----- -/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search 31 January 2013	Date of mailing of the international search report 15/02/2013
--	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Maukonen, Kalle
--	---

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2012/000326

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 225 381 A1 (HENRY TECHNOLOGIES INC [US]) 24 July 2002 (2002-07-24) figures 3,4 -----	32-34
A	EP 0 137 275 A2 (CATERPILLAR MITSUBISHI LTD [JP]) 17 April 1985 (1985-04-17) figures 1,2 -----	37,38, 41-44
A	GB 1 129 329 A (GEWERK EISENHUETTE WESTFALIA) 2 October 1968 (1968-10-02) page 2, lines 10-12; figure 1 -----	39
A	US 7 506 690 B2 (KELLEY TERRY E [US] KELLEY TERRY EARL [US]) 24 March 2009 (2009-03-24) figure 3 -----	1,45

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2012/000326

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-45

Injection device and method of controlling injection D1 (EP 2 103 853) is to be considered the closest prior art. It discloses an injection device according to claim 1. It further discloses all the features of dependent claims 2-13.

Thus, the special technical feature (STF) of this invention would be the feature of the next dependent claim, claim 14: limiting arrangement being an elongate member. As elongate is merely a relative term, one needs to add the following limiting feature to the STF: the elongate member extending through the second valve member (claim 15).

This STF allows the construction of the injection device to be more compact in the radial direction.

2. claims: 46-48

Injection device

As D1 discloses all the features of claims 46-48, this invention has no STF.

3. claims: 49-51

Injection device

D1, in the embodiment of figures 3.1-3.3, is considered to disclose the features of claims 49, 50 and 51. This invention therefore has no STF.

4. claim: 52

Injection device

The STF of this invention is the filter arrangement permitting bypass. The function of this STF is to assure cleanliness of the injected fluid whilst not increasing pressures to dangerous levels.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2012/000326

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2103853	A2	23-09-2009	DE 102008000739 A1
			EP 2103853 A2
			24-09-2009
			23-09-2009

US 2591528	A	01-04-1952	NONE

GB 2279725	A	11-01-1995	AU 7081194 A
			GB 2279725 A
			WO 9501826 A1
			06-02-1995
			11-01-1995
			19-01-1995

EP 1225381	A1	24-07-2002	EP 1225381 A1
			JP 2002350007 A
			US 2002096210 A1
			24-07-2002
			04-12-2002
			25-07-2002

EP 0137275	A2	17-04-1985	DE 3478050 D1
			EP 0137275 A2
			08-06-1989
			17-04-1985

GB 1129329	A	02-10-1968	NONE

US 7506690	B2	24-03-2009	US 2007000663 A1
			WO 2007124471 A2
			04-01-2007
			01-11-2007
