

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 November 2007 (15.11.2007)

PCT

(10) International Publication Number
WO 2007/130195 A3

(51) International Patent Classification:
E21B 43/08 (2006.01)

(21) International Application Number:
PCT/US2007/004473

(22) International Filing Date:
22 February 2007 (22.02.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/797,897 4 May 2006 (04.05.2006) US
11/509,180 23 August 2006 (23.08.2006) US

(71) Applicant (for all designated States except US): **PUROLATOR FACET, INC.** [US/US]; 8439 Triad Drive, Greensboro, NC 27409-9621 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HOPKINS, Sam, A.** [US/US]; 2524 Pine Hall Road, Belews Creek, NC 27009 (US). **WELLS, Donald, G.** [US/US]; 19710 Caroling Oaks Court, Humble, TX 77346 (US).

(74) Agent: **YOSICK, Joseph, A.**; Brinks Hofer Gilson & Li-one, P.O. Box 10087, Chicago, IL 60610 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

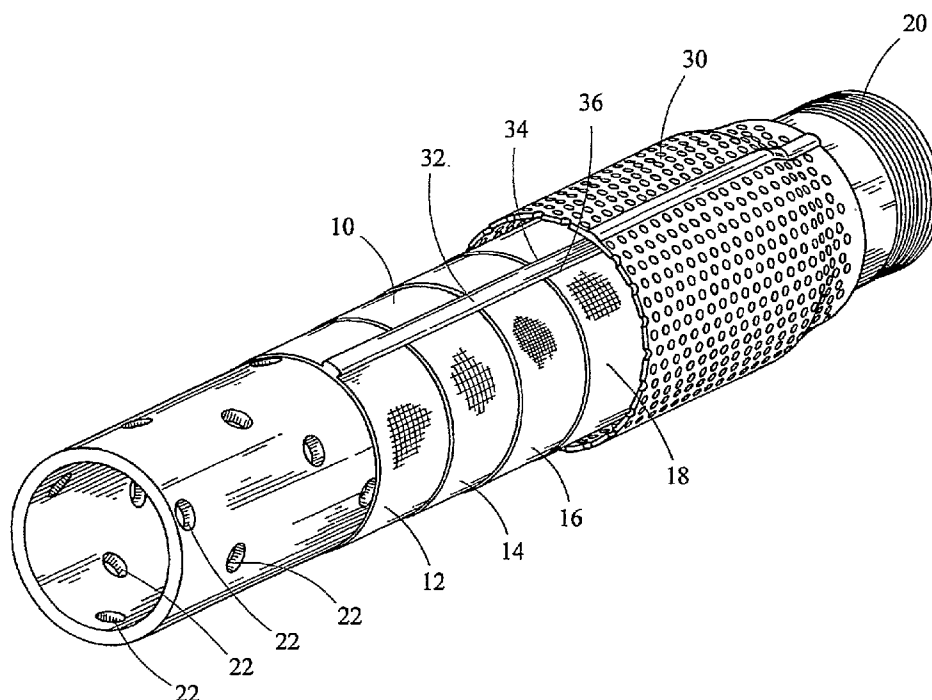
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: PARTICLE CONTROL SCREEN WITH DEPTH FILTRATION



(57) Abstract: A particle control screen includes a support layer. A first filter layer is disposed around the support layer. A second filter layer is disposed around the first filter layer. A third filter layer is disposed around the second filter layer. Each of the filter layers has a pore size. The pore size of the third filter layer is greater than the pore size of the second filter layer. The pore size of the second filter layer is greater than the pore size of the first filter layer.



(88) Date of publication of the international search report:

10 January 2008

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/04473

A. CLASSIFICATION OF SUBJECT MATTER IPC: E21B 43/08(2006.01) USPC: 166/227,230,233,278 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) U.S. : 166/227, 230, 233, 278 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) EAST: screen, layer, filter, wellbore		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US RE 31,604 (BEARDEN et al) 19 June 1984 (19.06.1984), Fig. 3; column 3, lines 1-48.	1 and 5-9
---		-----
Y		2-4 and 10-23
Y	US 6,263,966 B1 (HAUT et al) 24 July 2001 (24.07.2001), Figure 3, column 3, line 58 through column 4, line 10.	2-4, 10, 12-14, and 20
Y	US 6,514,408 B1 (SIMONE) 04 February 2003 (04.02.2003), Figures 1-4, column 3, lines 36-45.	11, 15-19, and 21-23
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> 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	"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
"E"	earlier application or patent published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search 03 September 2007 (03.09.2007)		Date of mailing of the international search report 19 NOV 2007
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer David Bagnell <i>[Signature]</i> Telephone No. 571-272-3600