



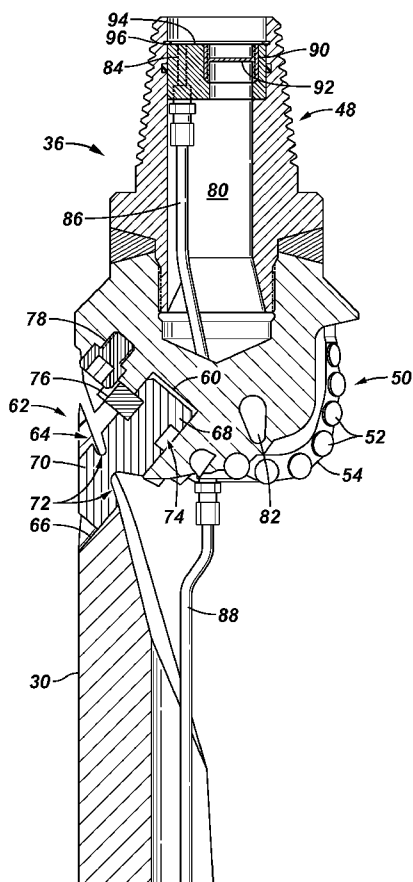
- (51) International Patent Classification:  
E21B 10/16 (2006.01) E21B 7/04 (2006.01)  
E21B 10/26 (2006.01)
- (21) International Application Number:  
PCT/US2012/027322
- (22) International Filing Date:  
1 March 2012 (01.03.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/448,085 1 March 2011 (01.03.2011) US
- (71) Applicant (for all designated States except US): SMITH INTERNATIONAL, INC. [US/US]; 1310 Rankin Road, Houston, Texas 77073 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): ALSUP, Shelton [US/US]; 1523 Heights #8, Houston, Texas 77008 (US). GREGUREK, Philip M. [US/US]; 2707 Golden Creek Lane, Pearland, Texas 77584 (US). SWADI, Shantanu [US/US]; 13115 Rockhill Point Dr., Cypress, Texas 77429 (US).
- (74) Agents: SHELLEY II, Mark D. et al.; Smith International, Inc., 1310 Rankin Road, Houston, Texas 77073 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

[Continued on next page]

(54) Title: HIGH PERFORMANCE WELLBORE DEPARTURE AND DRILLING SYSTEM

(57) Abstract: A system and method facilitate drilling of lateral wellbores by optionally eliminating one or more trips downhole. The system and method provide for drilling a lateral wellbore by enabling the milling of a casing window and the drilling of the desired lateral wellbore to a target depth during a single trip down hole. The system and method also facilitate better downhole dynamics control and improved overall bottom hole assembly functionality during drilling.

FIG. 4





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))*
- *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:**

15 November 2012

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2012/027322****A. CLASSIFICATION OF SUBJECT MATTER*****E21B 10/16(2006.01)i, E21B 10/26(2006.01)i, E21B 7/04(2006.01)i***

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 10/16; E21B 10/00; E21B 29/10; E21B 7/04

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: shear, mill, whipstock, couple and similar terms

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	US 2005-0039905 A1 (HART, DANIEL et al.) 24 February 2005 See paragraphs 13-18 and figures 1, 2	1-4,6,7,11,13-17 5 8-10,12
Y	US 2004-0173384 A1 (YONG, ZHOU et al.) 09 September 2004 See the abstract and figure 1	5
A	US 2008-0302575 A1 (DURAIRAJAN,BALA et al.) 11 December 2008 See paragraph 48 figure 1	1-17
A	US 7267175 B2 (HAUGEN, DAVID M.) 11 September 2007 See column 6, line 4 - column 6, line32 and figures 4A-4C	1-17

 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 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

18 SEPTEMBER 2012 (18.09.2012)

Date of mailing of the international search report

**25 SEPTEMBER 2012 (25.09.2012)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan  
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Bonghoon Lee

Telephone No. 82-42-481-8553



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/027322

**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:

Independent claims 1, 11 are directed to a system for facilitating drilling of a lateral wellbore and a method of facilitating drilling of a lateral wellbore. Independent claim 18 is directed to a system for facilitating drilling of a lateral wellbore.

The common technical features which claim 18 is sharing with claims 1, 11 include:

a) a steerable drilling assembly having a cutting implement enabling both milling through a casing and partially drilling a lateral wellbore in a single trip b) a whipstock releasably coupled to the cutting implement by an attachment member

However, these technical features lack novelty/inventive step with respect to US 2005/0039905 A1 (Hart, Daniel et al.). Thus independent claim 18 does not share any technical relationship left over the prior art with independent claims 1, 11 leaving the claims without a single general inventive concept. Hence, there is lack of unity a posteriori (PCT Rule 13.1 and 13.2).

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 fee, this Authority did not invite payment of any additional fee.
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.: 1-17

**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.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005-0039905 A1	24.02.2005	AU 1999-49910 A1	07.02.2000
		AU 1999-50012 A1	07.02.2000
		AU 2002-325045 B2	13.03.2008
		AU 2002-325045 B8	13.03.2008
		AU 2005-255028 A1	29.12.2005
		AU 2005-255028 B2	30.06.2011
		AU 2009-285695 A1	04.03.2010
		CA 2459723 A1	27.03.2003
		CA 2459723 C	19.02.2008
		CA 2480187 A1	02.03.2005
		CA 2480187 C	18.11.2008
		CA 2560461 A1	13.10.2005
		CA 2560461 C	01.06.2010
		CA 2570378 A1	29.12.2005
		CA 2570378 C	19.10.2010
		CA 2572240 A1	02.02.2006
		CA 2572240 C	28.09.2010
		CA 2579647 C	31.08.2010
		CA 2600843 A1	21.09.2006
		CA 2600843 C	21.06.2011
		CA 2612111 A1	28.12.2006
		CA 2623231 A1	05.04.2007
		CA 2623231 C	19.04.2011
		CA 2734977 A1	04.03.2010
		CN 101310090 A	19.11.2008
		CN 101310090 C0	19.11.2008
		EP 1926883 A1	04.06.2008
		EP 2326788 A2	01.06.2011
		EP 2450525 A2	09.05.2012
		EP 2450525 A3	20.06.2012
		GB 2356657 A	30.05.2001
		GB 2357102 A	13.06.2001
		GB 2379947 A	26.03.2003
		GB 2405654 A	09.03.2005
		GB 2416559 A	01.02.2006
		GB 2419622 A	03.05.2006
		GB 2422165 A	19.07.2006
		GB 2427639 A	03.01.2007
		GB 2429475 A	28.02.2007
		GB 2429485 A	28.02.2007
		GB 2430960 A	11.04.2007
		GB 2433765 A	04.07.2007
		GB 2434607 A	01.08.2007
		GB 2440452 A	30.01.2008
		GB 2441927 A	19.03.2008
		GB 2470859 A	08.12.2010
		US 2002-0092655 A1	18.07.2002
		US 2003-0066650 A1	10.04.2003
		US 2003-0098181 A1	29.05.2003

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2004-0069504 A1	15.04.2004
		US 2004-0112642 A1	17.06.2004
		US 2004-0124008 A1	01.07.2004
		US 2004-0206548 A1	21.10.2004
		US 2004-0256161 A1	23.12.2004
		US 2005-0098349 A1	12.05.2005
		US 2005-0183892 A1	25.08.2005
		US 2005-0194143 A1	08.09.2005
		US 2005-0274547 A1	15.12.2005
		US 2006-0065402 A9	30.03.2006
		US 2006-0070771 A1	06.04.2006
		US 2006-0124352 A1	15.06.2006
		US 2007-0007041 A1	11.01.2007
		US 2007-0045006 A1	01.03.2007
		US 2007-0068704 A1	29.03.2007
		US 2007-0079995 A1	12.04.2007
		US 2008-0149393 A1	26.06.2008
		US 2008-0223575 A1	18.09.2008
		US 2010-0051350 A1	04.03.2010
		US 2011-0168448 A9	14.07.2011
		US 6415877 B1	09.07.2002
		US 6648081 B2	18.11.2003
		US 6854532 B2	15.02.2005
		US 6957698 B2	25.10.2005
		US 6981561 B2	03.01.2006
		US 7096975 B2	29.08.2006
		US 7114581 B2	03.10.2006
		US 7174975 B2	13.02.2007
		US 7178609 B2	20.02.2007
		US 7270185 B2	18.09.2007
		US 7316274 B2	08.01.2008
		US 7353887 B2	08.04.2008
		US 7395882 B2	08.07.2008
		US 7624818 B2	01.12.2009
		US 7721822 B2	25.05.2010
		US 7748475 B2	06.07.2010
		US 7757784 B2	20.07.2010
		US 7806203 B2	05.10.2010
		US 7954570 B2	07.06.2011
		US 8006785 B2	30.08.2011
		US 8011450 B2	06.09.2011
		US 8146683 B2	03.04.2012
		WO 00-03600 A2	27.01.2000
		WO 00-03600 A3	27.01.2000
		WO 00-04269 A2	27.01.2000
		WO 00-04269 A3	27.01.2000
		WO 03-025336 A1	27.03.2003
		WO 2005-001237 A1	06.01.2005
		WO 2005-080742 A1	01.09.2005
		WO 2005-095751 A1	13.10.2005

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		WO 2005-124091 A1	29.12.2005
		WO 2006-012186 A1	02.02.2006
		WO 2006-029379 A1	16.03.2006
		WO 2006-099362 A1	21.09.2006
		WO 2006-138565 A1	28.12.2006
		WO 2007-038208 A1	05.04.2007
		WO 2010-025313 A2	04.03.2010
		WO 2010-025313 A3	04.03.2010
		WO 2010-025313 A4	04.03.2010
US 2004-0173384 A1	09.09.2004	CA 2458158 A1	04.09.2004
		CA 2458158 C	24.04.2007
		GB 0404709 D0	07.04.2004
		GB 2399043 A	08.09.2004
		GB 2399043 B	17.05.2006
		US 7040424 B2	09.05.2006
US 2008-0302575 A1	11.12.2008	GB 0810112 D0	09.07.2008
		GB 0913701 D0	16.09.2009
		GB 201009778 D0	21.07.2010
		GB 2450222 A	17.12.2008
		GB 2450222 B	12.05.2010
		GB 2462206 A	03.02.2010
		GB 2462206 B	12.01.2011
		GB 2471020 A	15.12.2010
		GB 2471020 A8	09.02.2011
		GB 2471020 B	11.05.2011
		US 7703557 B2	27.04.2010
US 7267175 B2	11.09.2007	AU 2000-18679 A1	12.07.2000
		AU 2000-18679 B2	22.04.2004
		AU 2000-18687 A1	12.07.2000
		AU 2000-18687 B2	29.04.2004
		AU 2000-18688 A1	12.07.2000
		AU 2000-18688 B2	11.09.2003
		AU 2000-18689 A1	12.07.2000
		AU 2000-18689 B2	23.10.2003
		AU 2000-18766 A1	12.07.2000
		AU 2000-18766 B2	29.04.2004
		AU 2000-18768 A1	12.07.2000
		AU 2000-18768 B2	16.10.2003
		AU 2001-10442 A1	03.07.2001
		AU 2001-10442 B2	06.05.2004
		AU 2002-14137 A1	21.05.2002
		AU 2002-212537 B2	05.04.2007
		AU 2002-214137 B2	04.01.2007
		AU 2002-339101 A1	10.06.2003
		AU 2003-255716 A1	02.02.2004
		AU 2003-255716 A8	02.02.2004
		CA 2356130 A1	29.06.2000

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		CA 2356130 C	02.03.2010
		CA 2356131 A1	29.06.2000
		CA 2356131 C	29.01.2008
		CA 2356144 A1	29.06.2000
		CA 2356144 C	12.12.2006
		CA 2356148 A1	29.06.2000
		CA 2356148 C	04.10.2005
		CA 2356184 A1	29.06.2000
		CA 2356184 C	26.05.2009
		CA 2356194 A1	29.06.2000
		CA 2356194 C	27.02.2007
		CA 2393744 A1	28.06.2001
		CA 2393744 C	27.05.2008
		CA 2428479 A1	16.05.2002
		CA 2428479 C	04.07.2006
		CA 2441814 A1	26.09.2002
		CA 2441814 C	04.01.2011
		CA 2445033 A1	17.10.2002
		CA 2445033 C	07.07.2009
		CA 2446675 C	25.03.2008
		CA 2452857 A1	05.06.2003
		CA 2452857 C	28.07.2009
		CA 2459053 A1	26.08.2004
		CA 2459053 C	10.07.2007
		CA 2460829 A1	22.01.2004
		CA 2460829 C	09.09.2008
		CA 2461851 A1	25.09.2004
		CA 2461851 C	27.11.2007
		CA 2461855 A1	25.09.2004
		CA 2461855 C	20.05.2008
		CA 2462031 A1	25.09.2004
		CA 2462031 C	27.11.2007
		CA 2462115 C	22.12.2009
		CA 2473216 A1	09.01.2005
		CA 2473216 C	20.11.2007
		CA 2497854 A1	29.06.2000
		CA 2497854 C	15.08.2006
		CA 2509317 A1	08.12.2005
		CA 2509317 C	04.08.2009
		CA 2511628 A1	27.01.2006
		CA 2511628 C	01.09.2009
		CA 2519325 A1	30.03.2006
		CA 2519325 C	03.06.2008
		CA 2529016 A1	23.12.2004
		CA 2537867 A1	16.05.2002
		CA 2537867 C	20.03.2007
		CA 2557965 A1	29.06.2000
		CA 2557965 C	19.08.2008
		CA 2560501 A1	29.06.2000
		CA 2560501 C	25.03.2008



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		CA 2564290 A1	29.06.2000
		CA 2564290 C	29.01.2008
		CA 2565202 A1	29.06.2000
		CA 2603100 A1	29.06.2000
		CA 2603100 C	15.02.2011
		CA 2622596 A1	30.03.2006
		CA 2622596 C	24.11.2009
		CA 2663922 A1	17.10.2002
		CA 2663922 C	16.08.2011
		CA 2683103 A1	10.04.2003
		CA 2686423 A1	29.06.2000
		EP 1141515 A1	10.10.2001
		EP 1141517 A1	10.10.2001
		EP 1141517 B1	08.12.2004
		EP 1141518 A1	10.10.2001
		EP 1141518 B1	26.10.2005
		EP 1144802 A2	17.10.2001
		EP 1144802 B1	08.12.2004
		EP 1147287 A2	24.10.2001
		EP 1147287 B1	17.08.2005
		EP 1151180 A1	07.11.2001
		EP 1242714 A1	25.09.2002
		EP 1242714 B1	06.06.2012
		EP 1333963 A2	13.08.2003
		EP 1333963 B1	10.01.2007
		EP 1413709 A2	28.04.2004
		EP 1413709 A3	29.09.2004
		EP 1413709 B1	28.07.2010
		EP 1505251 A2	09.02.2005
		EP 1505251 A3	14.02.2007
		EP 1505251 B1	13.05.2009
		EP 1510651 A2	02.03.2005
		EP 1510651 A3	09.05.2007
		EP 1510651 B1	02.07.2008
		EP 1582274 A2	05.10.2005
		EP 1582274 A3	08.02.2006
		EP 1654346 A2	10.05.2006
		EP 1659259 A1	24.05.2006
		EP 2273064 A1	12.01.2011
		GB 2345308 A	05.07.2000
		GB 2346400 A	09.08.2000
		GB 2346632 A	16.08.2000
		GB 2346909 A	23.08.2000
		GB 2347445 A	06.09.2000
		GB 2382832 A	11.06.2003
		GB 2383065 A	18.06.2003
		GB 2383361 A	25.06.2003
		GB 2403749 A	12.01.2005
		GB 2415001 A	14.12.2005
		GB 2415453 A	28.12.2005

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		GB 2416551 A	01.02.2006
		GB 2418683 A	05.04.2006
		GB 2428717 A	07.02.2007
		GB 2463400 A	17.03.2010
		GB 2463588 A	24.03.2010
		US 2001-040054 A1	15.11.2001
		US 2001-045284 A1	29.11.2001
		US 2002-060079 A1	23.05.2002
		US 2002-079100 A1	27.06.2002
		US 2002-079106 A1	27.06.2002
		US 2002-112338 A1	22.08.2002
		US 2002-145281 A1	10.10.2002
		US 2002-166664 A1	14.11.2002
		US 2002-166668 A1	14.11.2002
		US 2002-175474 A1	28.11.2002
		US 2002-185274 A1	12.12.2002
		US 2002-195256 A1	26.12.2002
		US 2003-019638 A1	30.01.2003
		US 2003-024711 A1	06.02.2003
		US 2003-042022 A1	06.03.2003
		US 2003-042028 A1	06.03.2003
		US 2003-062171 A1	03.04.2003
		US 2003-106698 A1	12.06.2003
		US 2003-132032 A1	17.07.2003
		US 2003-136561 A1	24.07.2003
		US 2003-188868 A1	09.10.2003
		US 2004-055756 A1	25.03.2004
		US 2004-079528 A1	29.04.2004
		US 2004-131812 A1	08.07.2004
		US 2004-149454 A1	05.08.2004
		US 2004-159466 A1	19.08.2004
		US 2004-163823 A1	26.08.2004
		US 2004-173355 A1	09.09.2004
		US 2004-177974 A1	16.09.2004
		US 2004-216506 A1	04.11.2004
		US 2004-216878 A1	04.11.2004
		US 2004-216925 A1	04.11.2004
		US 2004-226723 A1	18.11.2004
		US 2004-251035 A1	16.12.2004
		US 2005-003458 A1	06.01.2005
		US 2005-005668 A1	13.01.2005
		US 2005-011650 A1	20.01.2005
		US 2005-016738 A1	27.01.2005
		US 2005-077046 A1	14.04.2005
		US 2005-121232 A1	09.06.2005
		US 2005-127673 A1	16.06.2005
		US 2005-155771 A1	21.07.2005
		US 2005-161222 A1	28.07.2005
		US 2005-252662 A1	17.11.2005
		US 2006-065408 A1	30.03.2006

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/027322**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2008-017387 A1	24.01.2008
		US 2008-202753 A1	28.08.2008
		US 2009-223680 A1	10.09.2009
		US 2010-218582 A1	02.09.2010
		US 2010-273680 A1	28.10.2010
		US 6325148 B1	04.12.2001
		US 6425444 B1	30.07.2002
		US 6446323 B1	10.09.2002
		US 6457532 B1	01.10.2002
		US 6527049 B2	04.03.2003
		US 6543552 B1	08.04.2003
		US 6578630 B2	17.06.2003
		US 6598678 B1	29.07.2003
		US 6688400 B2	10.02.2004
		US 6695063 B2	24.02.2004
		US 6698517 B2	02.03.2004
		US 6702029 B2	09.03.2004
		US 6702030 B2	09.03.2004
		US 6708769 B2	23.03.2004
		US 6712142 B2	30.03.2004
		US 6712151 B2	30.03.2004
		US 6742606 B2	01.06.2004
		US 6752215 B2	22.06.2004
		US 6851475 B2	08.02.2005
		US 6899181 B2	31.05.2005
		US 6902000 B2	07.06.2005
		US 6923261 B2	02.08.2005
		US 6976536 B2	20.12.2005
		US 6976539 B2	20.12.2005
		US 7004257 B2	28.02.2006
		US 7086478 B2	08.08.2006
		US 7093653 B2	22.08.2006
		US 7117957 B2	10.10.2006
		US 7124821 B2	24.10.2006
		US 7124826 B2	24.10.2006
		US 7168497 B2	30.01.2007
		US 7188687 B2	13.03.2007
		US 7234532 B2	26.06.2007
		US 7275602 B2	02.10.2007
		US 7322420 B2	29.01.2008
		US 7367404 B2	06.05.2008
		US 7373990 B2	20.05.2008
		US 7754439 B2	13.07.2010
		US 7921925 B2	12.04.2011
		US 8006771 B2	30.08.2011