



(51) International Patent Classification:

A61B 17/16 (2006.01) A61B 17/56 (2006.01)
A61B 17/28 (2006.01) A61B 17/32 (2006.01)

(21) International Application Number:

PCT/US20 12/065034

(22) International Filing Date:

14 November 2012 (14.11.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/316,969 12 December 2011 (12.12.2011) US

(71) Applicant: SPECIALTY SURGICAL INSTRUMENTATION INC. [US/US]; 3034 Owen Drive, Antioch, Tennessee 37013 (US).

(72) Inventor; and

(71) Applicant (for US only): AGBODOE, Victor, B. [US/US]; 8 Hollytree Road, Stoughton, Massachusetts 02072 (US).

(74) Agents: SULLIVAN, Todd, A. et al; Hayes Soloway PC, 175 Canal Street, Manchester, New Hampshire 03101 (US).

(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, BN, 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, PA, 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.

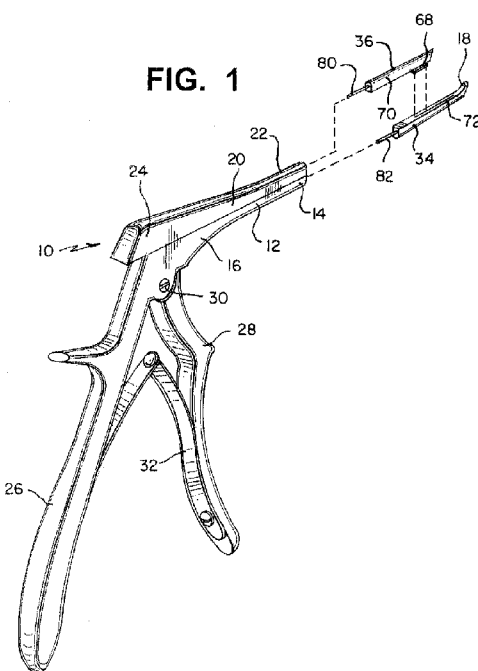
(84) Designated States (unless otherwise indicated, for every kind of regional protection available):

ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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))

(54) Title: RONGEUR WITH DETACHABLE TIPS



(57) Abstract: A rongeur has an elongated shank having a distal end and a proximal end. An elongated crossbar, which moves between a retracted position and a tissue capturing position, has a distal end and a proximal end and reciprocates axially with respect to the shank. A first tip is selectively connected to the shank. The first tip has a proximal end and a distal end. The proximal end has a reduced diameter post. In the selectively connected position, the reduced diameter post of the first tip is received in a bore of the shank. A second tip is selectively connected to the crossbar. The second tip has a proximal end and a distal end. The proximal end has a reduced diameter post. In the selectively connected position, the reduced diameter post of the second tip is received in a bore of the crossbar.

WO 2013/089959 A1

RONGEUR WITH DETACHABLE TIPS

Field of the Invention

The present invention relates to a rongeur, and more particularly to a rongeur
5 having a detachable tip.

Background

The rongeur is a medical instrument used for a variety of purposes. It is particularly useful for removing small amounts of bone, cartilage or other body material
10 from inside small spaces of the knee or between vertebrae. A rongeur usually includes a long fixed shank with an anvil or footplate at its distal end and a handle at its proximal end. A cross bar slideably engages the shank and reciprocates thereon by means of a pivotable second handle. Cutting edges on the distal end of the crossbar bite against the footplate to cut away a small portion of tissue with each reciprocation of the crossbar.
15 After use, the rongeur should be subject to a sterilization cycle before being reused. However, only the distal end of the rongeur, in the region of the footplate, typically comes into contact with tissue. Thus, there is a need in the art for a rongeur that has detachable tips that are easy to use. There is also a need for a rongeur that has detachable tips that can be one use only or disposable product. There is also a need for a rongeur with a
20 detachable tip so that there is reduced chance of the footplate breaking, the cutting edges always remain sharp, and there is less fatigue to the surgeons using the product.

Summary of the Invention

25 A rongeur in accordance with the present invention meets these needs by having an elongated shank having a distal end and a proximal end. A bore is disposed in the distal end of the shank. An elongated crossbar has a distal end and a proximal end adapted to reciprocate axially with respect to the shank. The crossbar moves between a retracted position and a tissue capturing position position. A bore is disposed in the distal end of
30 the crossbar. A first handle is fixedly connected to the shank proximal end. A second handle is pivotably attached to the shank proximal end about a pivot axis. A first tip is selectively connected to the shank. The first tip has a proximal end and a distal end. The proximal end has a reduced diameter post. In the selectively connected position the reduced diameter post of the first tip is received in the bore of the shank. A second tip is

selectively connected to the crossbar. The second tip has a proximal end and a distal end. The proximal end has a reduced diameter post. In the selectively connected position the reduced diameter post of the second tip is received in the bore of the shank.

5

Brief Description of the Drawings

FIG. 1 is an exploded perspective view of a rongeur according to the present invention;

10 FIG. 2A is a front elevation view of the rongeur of FIG. 1 in the forward or tissue capturing position;

FIG. 2B is a front elevation view of the rongeur of FIG. 1 in the relaxed or crossbar retracted position;

FIG. 3 is a top view of the rongeur of FIG. 1;

FIG. 4 is a front elevation view of the rongeur of FIG. 1 with parts broken away;

15 FIG. 5 is a cross sectional view taken along lines 5-5 of FIG. 4;

FIG. 6 is a cross sectional view taken along lines 6-6 of FIG. 4;

FIG. 7 is cross sectional view taken along lines 7-7 of FIG. 6;

FIG. 8 is a cross sectional view taken along lines 8-8 of FIG. 4;

FIG. 9 is an enlarged view of the detachable tips; and

20 FIG. 10 is a cross sectional view taken along lines 10-10 of FIG. 9.

25 **Detailed Description**

FIG. 1 illustrates a rongeur 10 according to the present invention. Rongeur 10 comprises an elongated shank 12 having a distal end 14 and proximal end 16. A crossbar 20 slideably engages the shank 12 and also comprises a distal end 22 and proximal end 24. A bore 23 is disposed in the distal end 22 of shank 12 for selectively receiving a
30 detachable tip 34. Similarly, a bore 25 is disposed in the distal end 22 of crossbar 20 for selectively receiving a detachable tip 36. A first handle 26 extends downwardly from the shank proximal end 16 in fixed relation to shank 12. A second handle 28 pivotably attaches to the shank 12 near its proximal end 16 and pivots about an axis 30. A spring 32 between the first and second handles 26 and 28 biases them apart to the relaxed or

crossbar retracted position as shown in FIG. 2B. A pair of detachable tips 34, 36 are shown in an exploded view in Figure 1. Lower or first tip 34 extends from shank 12. Upper or second tip 36 extends from crossbar 20. Tips 34, 36 are detachably connected to shank 12 and crossbar 20, respectively. A footplate 18 extends upwardly from tip 34 at its distal end. When the user moves handles 26, 28 toward each other, overcoming the spring bias of spring 32, crossbar 20 and tip 36 slide toward the footplate 18 until the distal end of tip 36 engages with footplate 18 so that the rongeur is in the forward or tissue capturing position as shown in FIG. 2A, which will be described in further detail below.

As further seen in FIGS. 4, 6 and 7, a T-shaped spline 38 depends downwardly from a lower surface 40 of the crossbar 20. A mating inverse T-shaped slot 42 is formed in shank 12. Slot 42 narrows from a wider portion 44 to a narrower portion 46. The ends 38a, 38b of T-shaped spline 38 are sufficiently sized to prevent T-shaped spline 38 from being withdrawn from the narrow portion 44 of slot 42, but to permit removal from the wider portion 44. Crossbar 20 can thus be brought into sliding contact with shank 12 by inserting T-shaped spline 38 through the wider portion of slot 42. Crossbar 20 can then be slid toward the distal end of the shank 12 so that the T-shaped spline 38 is under the narrow portion 46 of slot 42 as illustrated in Figure 6 to thereby allow slideable axial movement between the crossbar 20 and shank 12 without allowing the crossbar 20 to lift off of the shank 12. It will be appreciated by one of skill in the art that the locations of the splines and slots can be reversed and that other engaging shapes can be substituted therefor.

Turning further to FIGS. 2A, 2B, 3, 4, 8A, 8B, 9 and 10 tips 34, 36 and their detachment mechanism with shank 12 and crossbar 20 are illustrated. A spring biased release lever 48 is pivotably connected to shank 12. Similarly, a spring biased release lever 50 is pivotably connected to crossbar 20. Release levers 48 and 50 work in the same manner and, thus, release lever 48 will be described in detail. For the sake of brevity in this detailed description only the details of release lever 48 will be describe. One skilled in the art will readily recognize how to make and use release lever 50 based on the description of release lever 48. Referring to FIG. 3, a recess 52 is formed in both crossbar 20 and shank 12 to permit movement or depression of the release levers 48, 50 about their respective pivot points 54. A spring 56 biases the release levers 48, 50 into the engaged or locked position shown in FIG 8A. To disengage or unlock the release levers 48, 50, the user can push the release levers 48, 50 into the respective shank 12 and crossbar 20 in the direction indicated by arrow A in FIG. 8B at location 58 on the release lever. This action

can be done simultaneously, when the handles are in the relaxed position of FIG. 2B, if desired by the user. As shown in FIG. 2B, the release levers are aligned when handles 26, 28 are in the relaxed or crossbar retracted position. By pushing on lever 48 in the direction indicated by arrow A, lever 48 pivots about pin 54. Lever 48 has a pair of projecting shoulders 60, 62. Tip 34 has a mating pair of recessed slots 64, 66. When lever 48 is depressed to the position shown in FIG. 2B, the user can grab the tips 34, 36 and pull them away from the shank 12 and crossbar 20, in the direction indicated by arrow B in FIG. 8B, to remove them from rongeur 10. The tips can now be disposed of and a new set of tips 34, 36 can be used. Thus, there is a reduced chance of the footplate breaking, the cutting edges always remain sharp since they are used only during one procedure, and there is less fatigue to the surgeons using the product. While currently not preferred, the tips can be subject to a sterilization process and reused. However, to readily identify if the tips have been subject to a sterilization cycle, the tips have a sterilization mark or indicator 100 disposed therein, as shown in FIG. 9, which will change color should the tips be subject to a sterilization cycle. Tips 34, 36 are selectively slidably connected to each other in a manner similar to how shank 12 and crossbar are selectively connected together. As further seen in FIGS. 1, 9 and 10, a T-shaped spline 68 depends downwardly from a lower surface 70 of tip 36. A mating inverse T-shaped slot 72 is formed in shank 12. Slot 72 narrows from a wider portion 74 to a narrower portion 76. The ends 68a, 68b of T-shaped spline 68 are sufficiently sized to prevent T-shaped spline 68 from being withdrawn from the narrow portion 74 of slot 72, but to permit removal from the wider portion 74. Tip 36 can thus be brought into sliding contact with tip 34 by inserting T-shaped spline 68 through the wider portion of slot 72. Tip 36 can then be slid toward the distal end of tip 34 and footplate 18 so that the T-shaped spline 68 is under the narrow portion 76 of slot 72 as illustrated in Figure 9 to thereby allow slideable axial movement between the tip 36 and tip 34 without allowing the tip 36 to lift off of tip 34. It will be appreciated by one of skill in the art that the locations of the splines and slots can be reversed and that other engaging shapes can be substituted therefor. To insert a new set of tips 34, 36 into the shank 12 and crossbar 20, the tips 34, 36 are preferably placed in their slideable connected position as shown in FIG. 9. The user can then grab the tips 34, 36 and insert them, in the direction opposite to arrow B in FIG. 8B, into the shank 12 and crossbar 20. Each tip 34, 36 has at its proximal end reduced diameter post 78, 80, in which recesses 64, 66 are disposed. The proximal end of each tip has a beveled surface 82, 84 to facilitate insertion of the tips into the respective shank and crossbar. The distal

end of each lever 48, 50 has a mating beveled surface 86 to facilitate insertion of the tips into the respective shank and crossbar. Thus, when the user initially inserts the reduced diameter posts 78, 80 of each tip 34, 36 into the respective shank and crossbar, lever 48, 50 will move to the position shown in FIG. 8B. The user can continue to insert the tips 34, 36 into the respective shank and crossbar until fully inserted at which time levers 48, 50 will snap into the position shown in FIG. 8A and lock the tip 34 with shank 12 and tip 36 with crossbar 20 as shown, for example, in FIGS. 2A, 2B and 4.

A pin 88 on the crossbar 20 rides within a slot 90 on an upper portion 92 of the second handle 28 so that when the second handle 28 is squeezed toward the first handle 26 by an operator the slot 90 moves distally and the action of the pin 88 therein drives the crossbar 20 distally. Second handle 28 pivots about pin 94, which is fixedly connected to first handle 26 and shank 12. Turning further to FIG. 4, the footplate 18 comprises an anvil cutting surface 96 about a tissue receiving recess 98 and a stress relieving groove between the footplate 18 and tip 34 as more fully described in US Patent No. 4,990,148 to Worrick, III et al., which is hereby fully incorporated herein by reference. Cutting edges on the distal end of tip 36 engage the anvil surface 96 whereby tissue, as for instance bone, trapped therebetween is cut.

The invention now being fully described, it will be apparent to one of ordinary skill in the art that many modifications and changes can be made thereto without departing from the spirit or scope of the invention as defined in the following claims.

WHAT IS CLAIMED IS:

1. A rongeur comprising:
 - an elongated shank having a distal end and a proximal end, a bore being disposed
5 in the distal end of the shank;
 - an elongated crossbar having a distal end and a proximal end adapted to reciprocate axially with respect to the shank, the crossbar moving between a retracted position and a tissue capturing position position, a bore being disposed in the distal end of the crossbar;
 - 10 a first handle fixedly configured to the shank proximal end and a second handle pivotably attached to the shank proximal end about a pivot axis;
 - a first tip selectively connected to the shank, the first tip having a proximal end and a distal end, the proximal end having a reduced diameter post, in the selectively connected position the reduced diameter post of the first tip is received in the bore of the shank; and
 - 15 a second tip selectively connected to the crossbar, the second tip having a proximal end and a distal end, the proximal end having a reduced diameter post, in the selectively connected position the reduced diameter post of the second tip is received in the bore of the shank.
- 20 2. A rongeur according to claim 1 further comprising a first release lever being pivotably connected to the shank.
3. A rongeur according to claim 2 further comprising a second release lever being pivotably connected to the crossbar.
- 25 4. A rongeur according to claim 3 further comprising a first spring disposed between the shank and the first release lever that biases the first release lever into the first tip locked position.
- 30 5. A rongeur according to claim 4 further comprising a second spring disposed between the crossbar and the second release lever that biases the second release lever into the second tip locked position.

6. A rongeur according to claim 5 wherein a recess is disposed in the shank to permit pivotable movement of the first release lever.

7. A rongeur according to claim 6 wherein a recess is disposed in the crossbar
5 to permit pivotable movement of the second release lever.

8. A rongeur according to claim 5 wherein the first release lever has at least one projecting shoulder.

9. A rongeur according to claim 8 wherein at least one recessed slot is
10 disposed in the reduced diameter post of the first tip, the at least one recessed slot matingly receives the at least one projecting shoulder in the first tip locked position.

10. A rongeur according to claim 9 wherein the second release lever has at least
15 one projecting shoulder.

11. A rongeur according to claim 10 wherein at least one recessed slot is
disposed in the reduced diameter post of the second tip, the at least one recessed slot
matingly receives the at least one projecting shoulder in the second tip locked position.
20

12. A rongeur according to claim 5 wherein the second release lever has at least one projecting shoulder.

13. A rongeur according to claim 12 wherein at least one recessed slot is
25 disposed in the reduced diameter post of the second tip, the at least one recessed slot matingly receives the at least one projecting shoulder in the second tip locked position.

FIG. 1

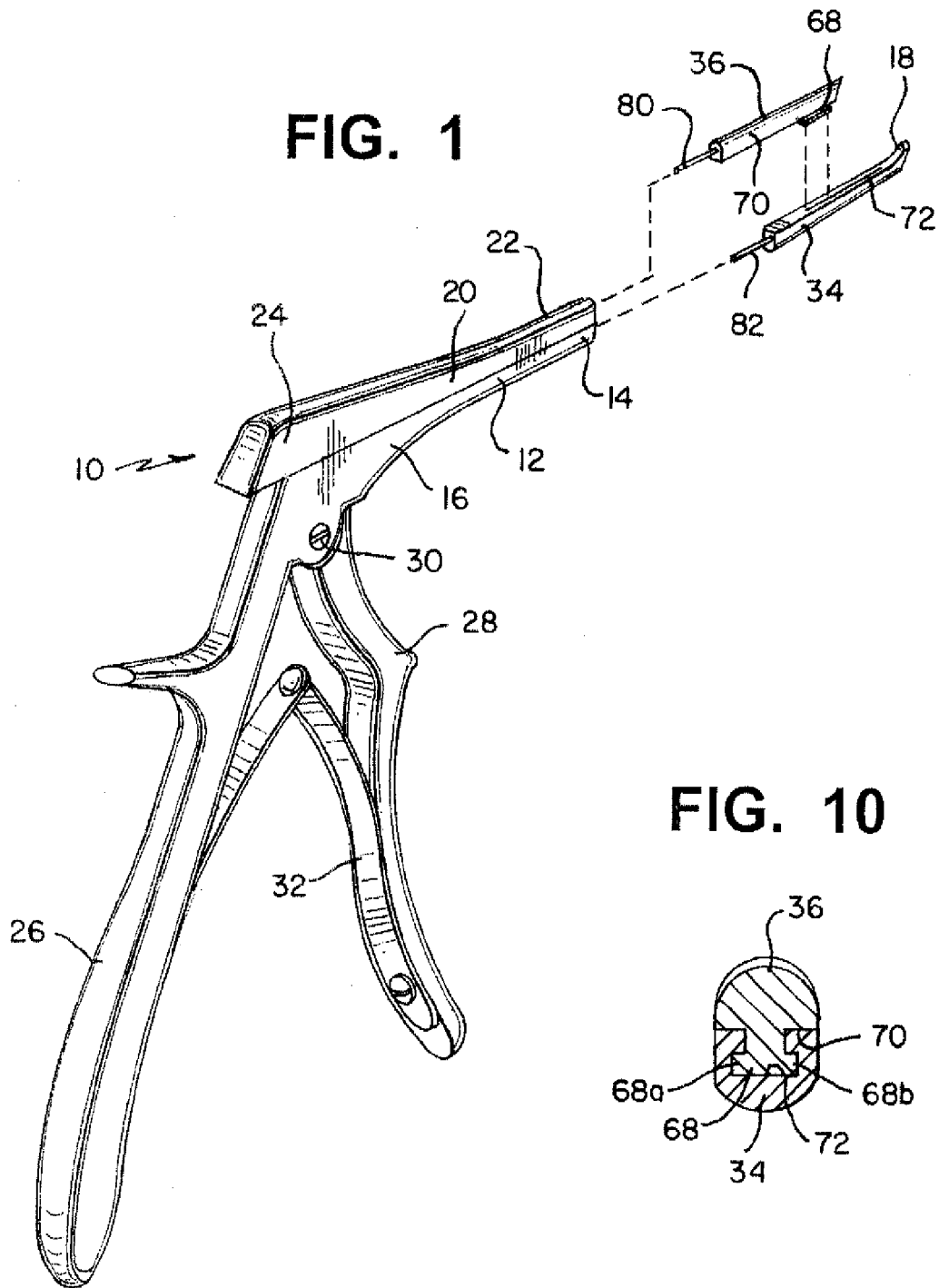


FIG. 10

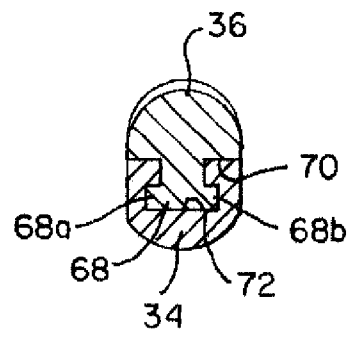


FIG. 2A

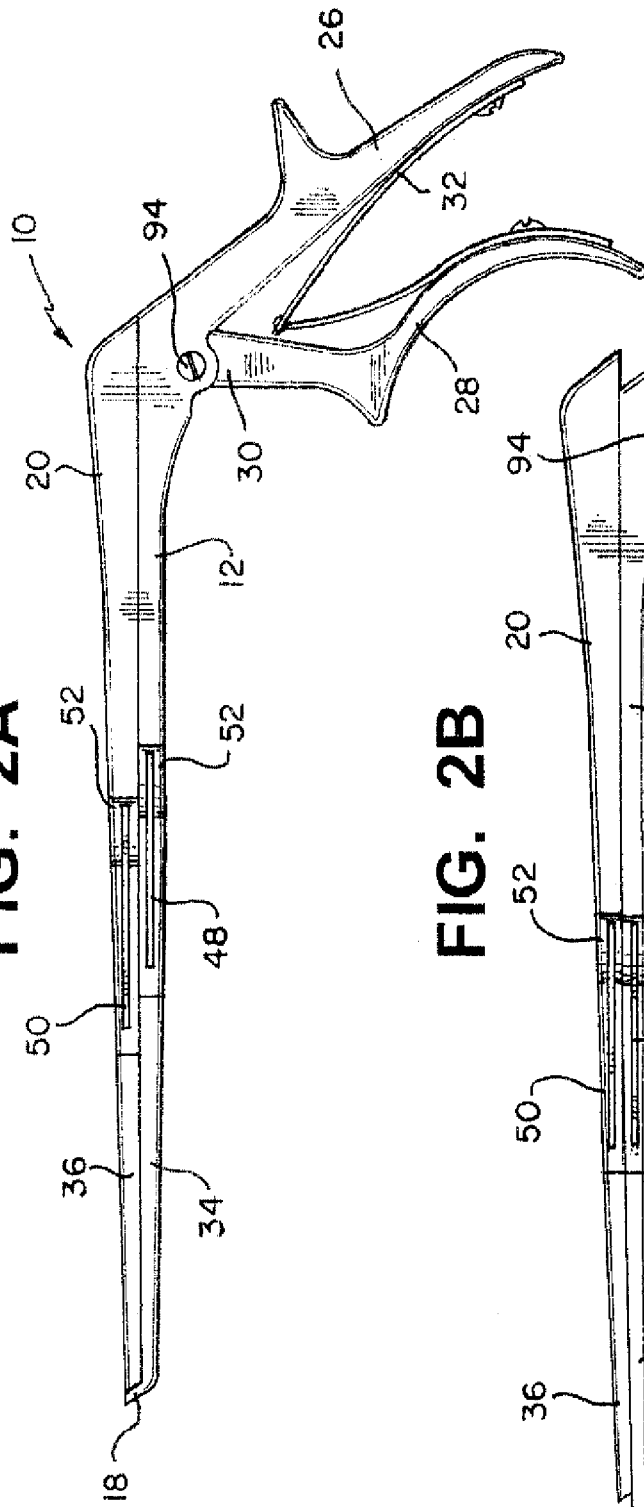


FIG. 2B

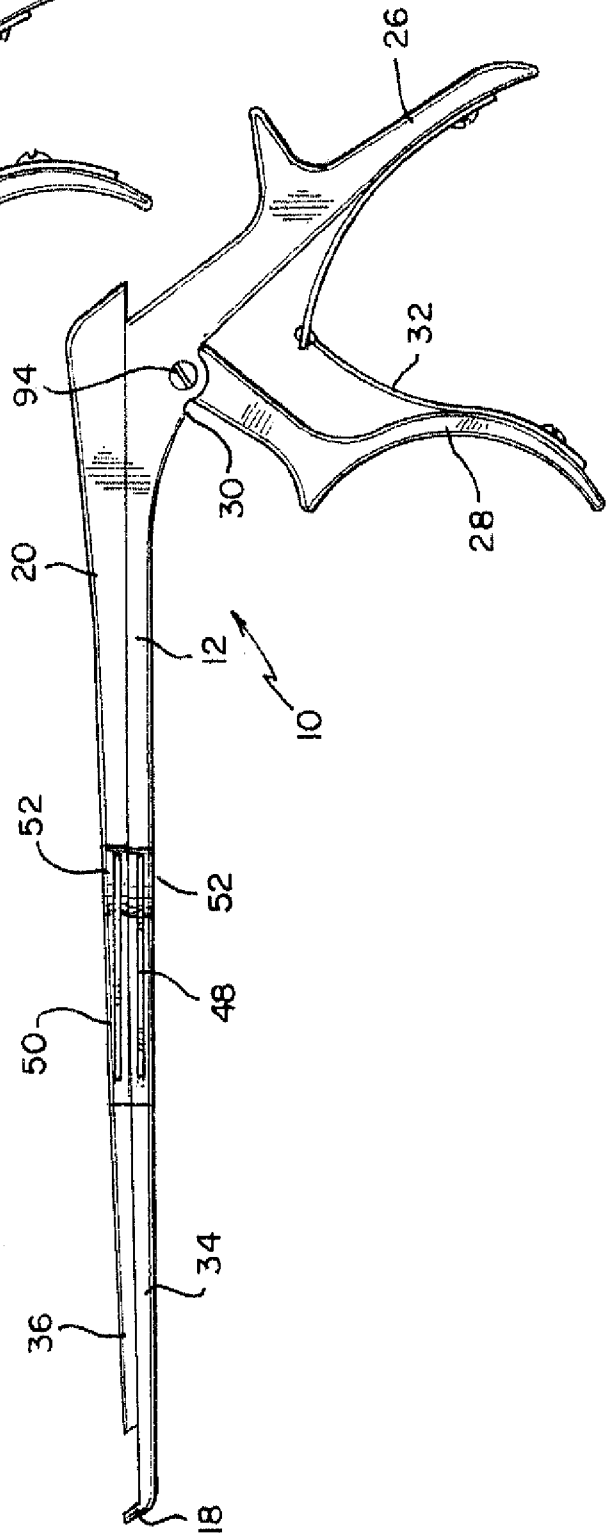


FIG. 3

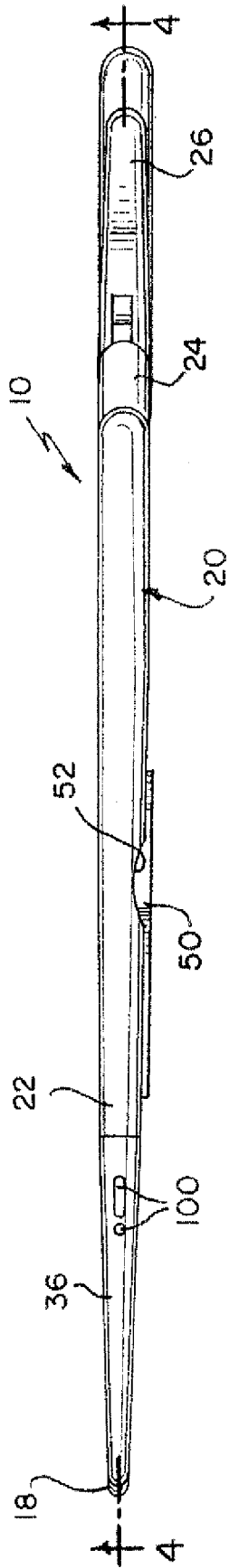


FIG. 8 A

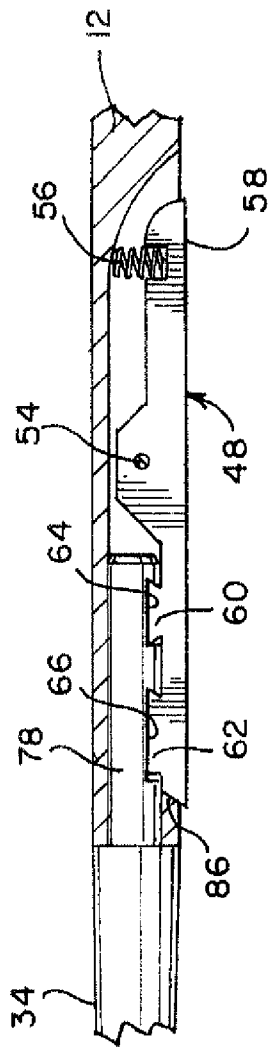
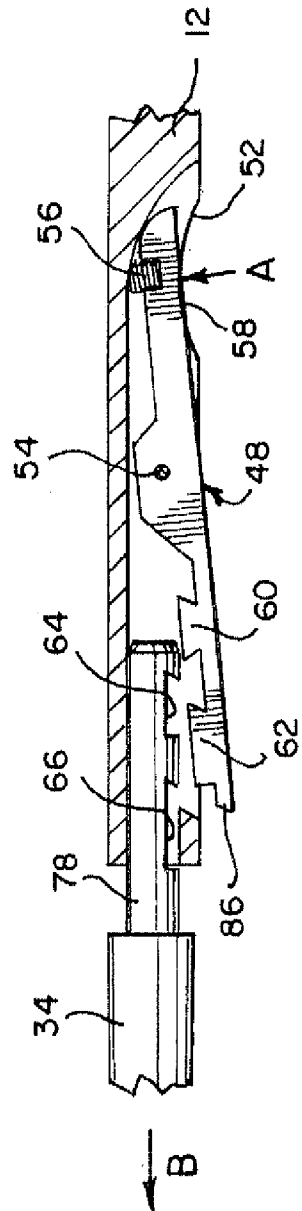


FIG. 8 B



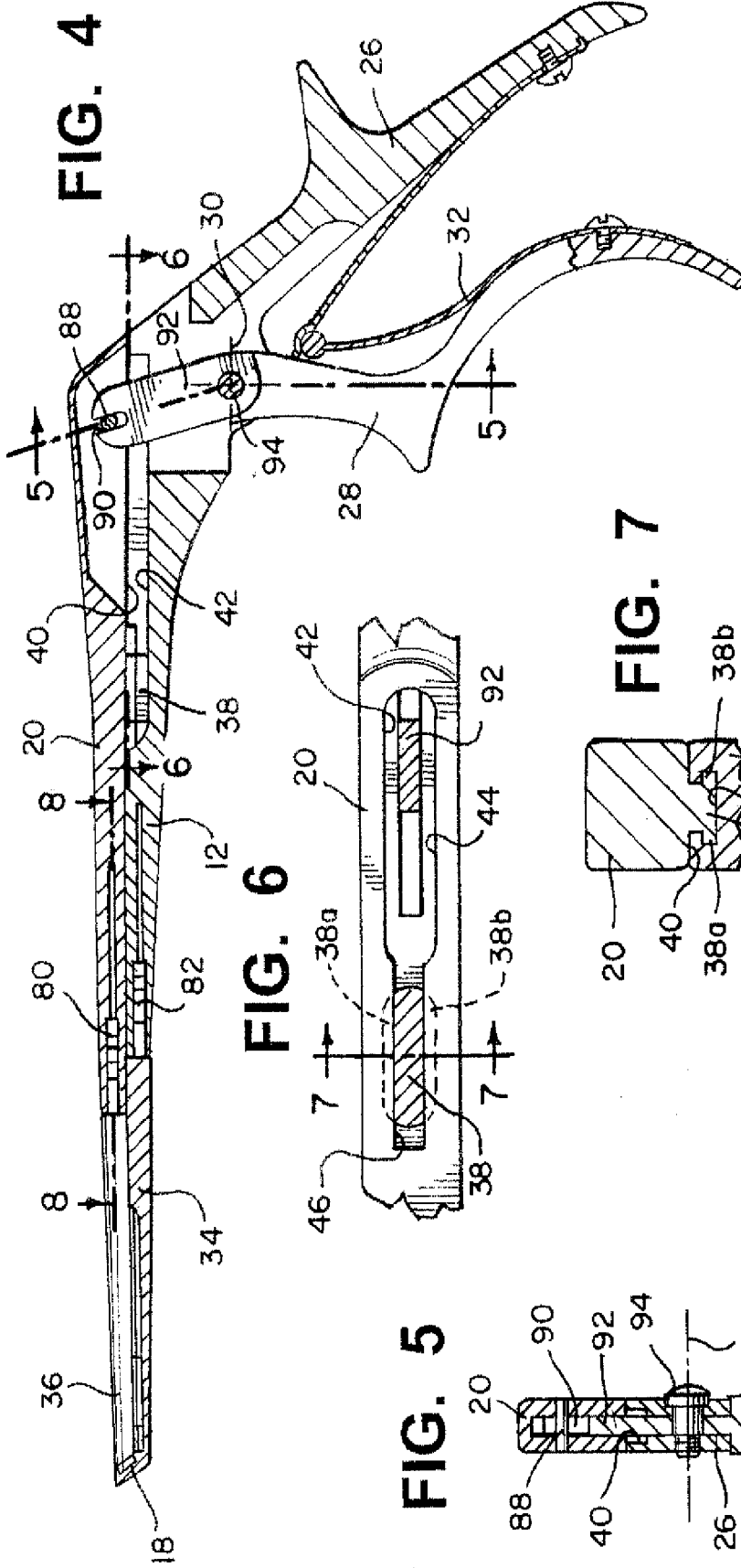


FIG. 4

FIG. 6

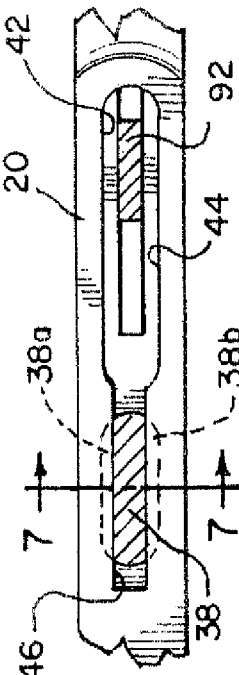


FIG. 7

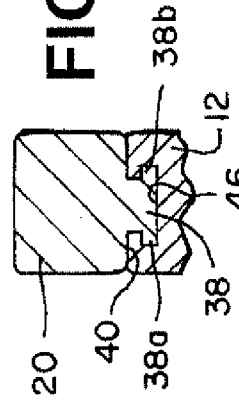


FIG. 9

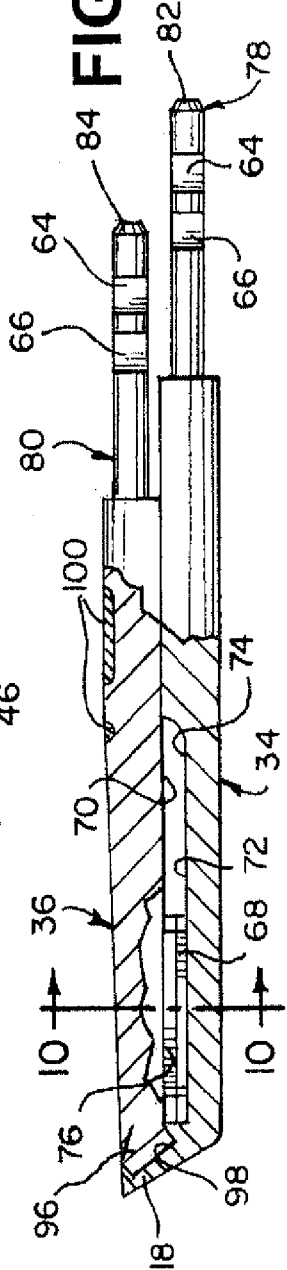
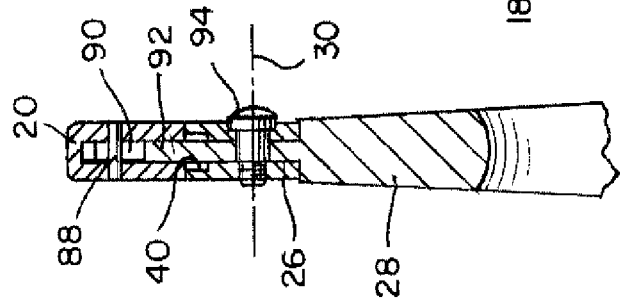


FIG. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/065034**A. CLASSIFICATION OF SUBJECT MATTER****A61B 17/16(2006.01)i, A61B 17/28(2006.01)1, A61B 17/56(2006.01)1, A61B 17/32(2006.01)1**

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)

A61B 17/16; A61B 17/00; A61B 17/04

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) & Keywords: rongeur, tip, detachable, lever, handle

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011-0190773 A1 (MICHELSON, G. K.) 4 August 2011 See abstract; paragraphs [0083]-[0085], [0116]; claims 1-2; and figs. 1-2.	1--13
A	US 5273519 A (KOROS, T. et al.) 28 December 1993 See abstract; column 7, lines 40-43; claim 1; and fig. 2.	1--13
A	US 6991633 B2 (AGBODOE, V. B.) 31 January 2006 See abstract; column 3, lines 11-19; column 4, lines 35-38; claim 1; and figs. 1, 7.	1--13
A	US 4990148 A (WORRICK, III, C. B. et al.) 5 February 1991 See abstract; column 3, lines 33-44; claim 1; and fig. 1.	1--13
A	US 2008-0161809 A1 (SCHMITZ, G. et al.) 3 July 2008 See abstract; paragraphs [0037]-[0038]; claim 1; and figs. 4A-4D.	1--13
A	US 7014638 B2 (MICHELSON, G. K.) 21 March 2006 See abstract; column 4, lines 54-67; column 6, lines 16-20; claim 1; and figs. 1, 6.	1--13

 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

"&" document member of the same patent family

Date of the actual completion of the international search

28 March 2013 (28.03.2013)

Date of mailing of the international search report

29 March 2013 (29.03.2013)

Name and mailing address of the ISA/KR

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

Facsimile No. 82-42-472-7140

Authorized officer

JUNG, Soo Hwan

Telephone No. 82-42-481-3580



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/065034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 201 1-0 190773 A 1	04 .08 .20 11	AT 287666 T	15 .02 .2005
		AU 1996- 15795 A	06 .06 . 1996
		CA 22050 14 A1	23 .05 . 1996
		CA 22050 14 C	12 .06 .2007
		DE 69533960 D1	03 .03 .2005
		DE 69533960 T2	12 .0 1 .2006
		DE 69533960 T8	27 .04 .2006
		EP 0790805 A1	27 .08 . 1997
		EP 0790805 A4	03 . 11 . 1999
		EP 0790805 B1	26 .0 1 .2005
		EP 1525853 A2	27 .04 .2005
		EP 1525853 A3	22 .06 .2005
		JP 03677684 B2	03 .08 .2005
		JP 03927577 B2	13 .06 .2007
		JP 10-508772 A	02 .09 . 1998
		JP 2005- 118606 A	12 .05 .2005
		US 2003-02 16740 A1	20 . 11 .2003
		US 56537 13 A	05 .08 . 1997
		US 6 142997 A	07 . 11 .2000
		US 6575977 B1	10 .06 .2003
US 7922723 B2	12 .04 .201 1		
US 8241290 B2	14 .08 .2012		
Wo 96- 14799 A1	23 .05 . 1996		
US 052735 19A A	28 . 12 . 1993	DE 4 115937 A1	07 .05 . 1992
		DE 9 117265 U1	19 . 11 . 1998
US 699 1633 B2	3 1 .0 1 .2006	AU 2004-200962 A1	14 . 10 .2004
		AU 2004-200962 B2	06 . 11 .2008
		BR PI040 1003A	17 .05 .2005
		CA 2462483 A1	30 .09 .2004
		DE 6020040 18217 D1	22 .0 1 .2009
		EP 1464291 A1	06 . 10 .2004
		EP 1464291 B1	10 . 12 .2008
		JP 2004-298636 A	28 . 10 .2004
		MX PA04003003A	0 1 .07 .2005
		US 2003-0069583 A1	10 .04 .2003
		US 2003-0187450 A1	02 . 10 .2003
		US 66857 10 B2	03 .02 .2004
US 04990 148A A	05 .02 . 199 1	EP 0378433 A3	11 .09 . 199 1
		EP 0378433 B1	17 .05 . 1995
		JP 02-246963 A	02 . 10 . 1990
US 2008-0 161809 A1	03 .07 .2008	AU 2005-295589 A1	27 .04 .2006
		AU 2005-295589 B2	03 . 12 .2009
		AU 2007-226692 A1	20 .09 .2007
		AU 2007-272427 A1	17 .0 1 .2008
		AU 2007-289243 A1	06 .03 .2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/065034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		AU 2007-329230 A1	12.06.2008
		AU 2009-27 1047 A1	21.01.2010
		AU 2010-223872 A1	16.09.2010
		AU 2010-246 130 A1	11.11.2010
		CA 2556975 A1	25.08.2005
		CA 2583906 A1	27.04.2006
		CA 2583906 C	06.12.2011
		CA 2646251 A1	20.09.2007
		CA 2657413 A1	17.01.2008
		CA 266 1869 A1	06.03.2008
		CA 2670831 A1	12.06.2008
		CA 2730732 A1	21.01.2010
		CA 2749673 A1	16.09.2010
		CA 2760925 A1	11.11.2010
		CN 102458273 A	16.05.2012
		EP 1799 129 A2	27.06.2007
		EP 20 19635 A2	04.02.2009
		EP 20435 15 A2	08.04.2009
		EP 20567 10 A2	13.05.2009
		EP 2088941 A2	19.08.2009
		EP 2 194861 A1	16.06.2010
		EP 2241274 A1	20.10.2010
		EP 2241274 B1	01.02.2012
		EP 2328489 A2	08.06.2011
		EP 2460479 A2	06.06.2012
		JP 2008-516694 A	22.05.2008
		JP 2009-52998 1 A	27.08.2009
		JP 2009-5436 12 A	10.12.2009
		JP 2010-502305 A	28.01.2010
		JP 2010-512 19 1 A	22.04.2010
		JP 2012- 17937 1 A	20.09.2012
		JP 2012-520 159 A	06.09.2012
		US 2006-0089609 A1	27.04.2006
		US 2006-0089633 A1	27.04.2006
		US 2006-0089640 A1	27.04.2006
		US 2006-0094976 A1	04.05.2006
		US 2006-0095059 A1	04.05.2006
		US 2006-010065 1 A1	11.05.2006
		US 2006-01 35882 A1	22.06.2006
		US 2006-0241648 A1	26.10.2006
		us 2006-025895 1 A1	16.11.2006
		us 2007-0123888 A1	31.05.2007
		us 2007-02 13733 A1	13.09.2007
		us 2007-02 13734 A1	13.09.2007
		us 2007-02 13735 A1	13.09.2007
		us 2007-0225703 A1	27.09.2007
		us 2007-0260252 A1	08.11.2007
		us 2007-0278 130 A1	06.12.2007
		us 2008-0086034 A1	10.04.2008
		us 2008-0086 114 A1	10.04.2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/065034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2008-0093054 A 1	24.04.2008
		US 2008-0103504 A 1	01.05.2008
		us 2008-0147084 A 1	19.06.2008
		us 2008-0275458 A 1	06.11.2008
		us 2008-0312660 A 1	18.12.2008
		us 2009-0018507 A 1	15.01.2009
		us 2009-0069709 A 1	12.03.2009
		us 2009-0125036 A 1	14.05.2009
		us 2009-0149865 A 1	11.06.2009
		us 2009-0171381 A 1	02.07.2009
		us 2009-0177241 A 1	09.07.2009
		us 2009-0204119 A 1	13.08.2009
		us 2010-0004654 A 1	07.01.2010
		us 2010-0010334 A 1	14.01.2010
		us 2010-0094231 A 1	15.04.2010
		us 2010-0274250 A 1	28.10.2010
		us 2010-0331883 A 1	30.12.2010
		us 2010-0331900 A 1	30.12.2010
		us 2011-0004207 A 1	06.01.2011
		us 2011-0046613 A 1	24.02.2011
		us 2011-0060314 A 1	10.03.2011
		us 2011-0098708 A 9	28.04.2011
		us 2011-0112539 A 1	12.05.2011
		us 2011-0130758 A 9	02.06.2011
		us 2011-0160731 A 1	30.06.2011
		us 2012-0078253 A 9	29.03.2012
		us 7553307 B 2	30.06.2009
		us 7555343 B 2	30.06.2009
		us 7578819 B 2	25.08.2009
		us 7738968 B 2	15.06.2010
		us 7738969 B 2	15.06.2010
		us 7740631 B 2	22.06.2010
		us 7857813 B 2	28.12.2010
		us 7887538 B 2	15.02.2011
		us 7918849 B 2	05.04.2011
		us 7938830 B 2	10.05.2011
		us 7959577 B 2	14.06.2011
		us 7963915 B 2	21.06.2011
		us 8048080 B 2	01.11.2011
		us 8062298 B 2	22.11.2011
		us 8062300 B 2	22.11.2011
		us 8092456 B 2	10.01.2012
		us 8192435 B 2	05.06.2012
		us 8192436 B 2	05.06.2012
		us 8221397 B 2	17.07.2012
		us 8257356 B 2	04.09.2012
		us 8394102 B 2	12.03.2013
		Wo 2005-077784 A 1	25.08.2005
		Wo 2006-044727 A 2	27.04.2006
		wo 2006-044727 A 3	27.04.2006

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/065034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		WO 2007--106740 A2	20. 09.,,2007
		WO 2007--106740 A3	20. 09.,,2007
		WO 2008--008898 A2	17. 01.,,2008
		WO 2008--008898 A3	17. 01.,,2008
		WO 2008--027926 A2	06. 03.,,2008
		WO 2008--027926 A3	06. 03.,,2008
		WO 2008--027927 A2	06. 03.,,2008
		WO 2008--027928 A2	06. 03.,,2008
		WO 2008--027929 A2	06. 03.,,2008
		WO 2008--027930 A2	06. 03.,,2008
		WO 2008--027931 A2	06. 03.,,2008
		WO 2008--027931 A3	06. 03.,,2008
		WO 2008--042793 A2	10. 04.,,2008
		WO 2008--042793 A3	03. 07.,,2008
		WO 2008--042793 A3	10. 04.,,2008
		WO 2008--070867 A2	12. 06.,,2008
		WO 2008--157513 A1	24. 12.,,2008
		WO 2009--009621 A2	15. 01.,,2009
		WO 2009--009621 A3	15. 01.,,2009
		WO 2009--032363 A1	12. 03.,,2009
		WO 2010--009093 A2	21. 01.,,2010
		WO 2010--009093 A3	21. 01.,,2010
		WO 2010--105261 A2	16. 09.,,2010
		WO 2010--105261 A3	16. 09.,,2010
		WO 2010--129525 A2	11. 11.,,2010
		WO 2010--129525 A3	11. 11.,,2010
US 7014638 B2	21.03.2006	US 06129740A A	10. 10.,,2000
		US 2004-0035903 A1	26. 02.,,2004
		US 6609322 B1	26. 08.,,2003