



Elekta AB's Ticking Time-Bomb

Intellectual Property Analysis of Elekta AB's Linear Accelerator, Multi-Leaf Collimator, and Positioning patents

January 15, 2014

Is Elekta AB an innovation leader in oncology or an over-inflated minor player in the medical devices industry? Between the quarterly reports and glowing press pieces, it is understandable that Elekta is performing strongly on the OMX Nordic Exchange. There is, however, a serious case to be made that Elekta's supposed strength is undermined by systemic issues visible in its intellectual property portfolio.

Elekta AB operates in the United States and a number of other countries, providing linear accelerators and coincident products and services to healthcare providers. Their newest product, the Versa HD™, has been billed as an oncology treatment with faster, more accurate radiation treatment for cancerous tumors in patients. Elekta has had some success in acquiring a backlog of orders, but finds itself limited by giant industry incumbents when it comes to proprietary rights for their products. In other words, is Elekta actually producing legally protected innovative medical devices, or are they attempting to maintain market share without the properties they need to sustain it?

Elekta's current patent portfolio consists of 421 patents and patent applications, only 127 of which are for devices in a commercially viable space. Thirteen of the patents, for Elekta's core technology, are potential active liabilities to the company, and another 44 have little to no commercial value. Our analysis has shown that industry incumbents like Siemens, Varian, and General Electric often have defensible, more robust patents that predate Elekta's holdings in critical areas. Elekta's portfolio is uncompetitive in this environment, and that should be taken into account when assessing the total enterprise.

Portfolio Analysis

Using our proprietary analytical systems, we looked at Elekta's patent portfolio. We found that many areas of core technology Elekta relies on were either heavily impaired or were in an innovation space already densely occupied by industry leaders.

Below is a list of strategically important patents to Elekta's business.

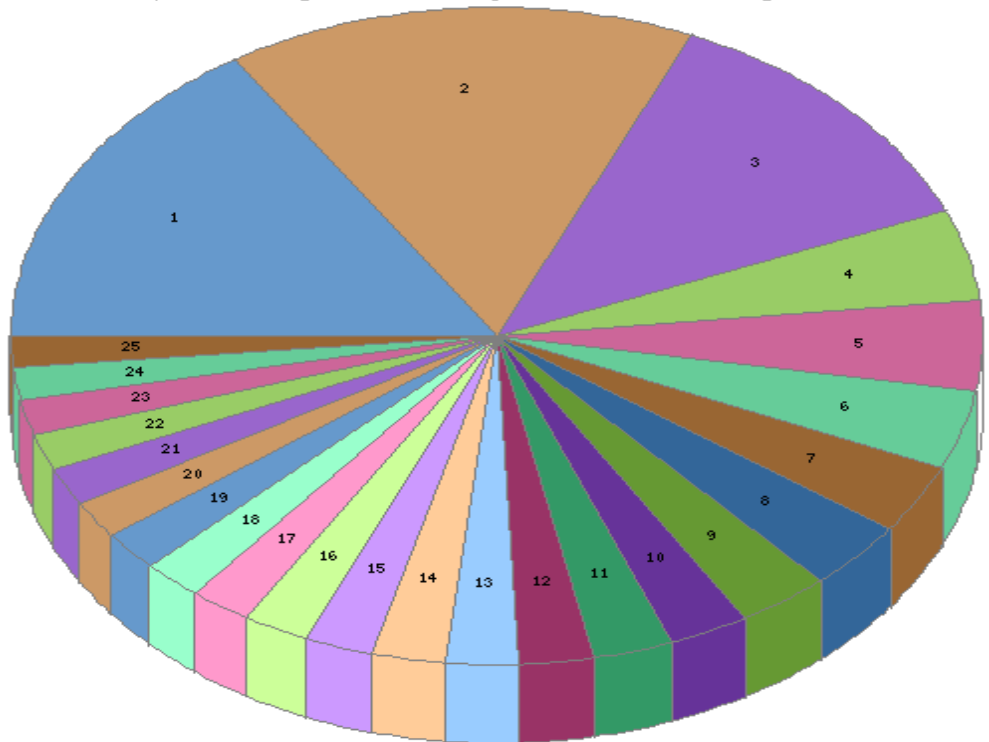
Document #	Title	Assignee Name	Priority	File	Issue
US5983424	Device for repositioning a patient	Elekta AB	12-Nov-96	03-Jun-98	16-Nov-99
US6714627	Collimator for radiotherapy apparatus	Elekta AB	19-Jul-99	24-May-01	30-Mar-04
US6283977	Stereotactic apparatus	Elekta AB	23-Sep-99	13-Dec-99	04-Sep-01
US6376990	Linear accelerator	Elekta AB	05-Feb-99	18-Apr-00	23-Apr-02

The US patent 5,983,424 granted to Elekta is in a densely occupied space, as there are 791 patents with earlier priority dates that closely match the innovation Elekta is trying to express. The patent is for a device which positions a patient receiving radiation therapy to maximize effectiveness of the treatment while minimizing adverse effects of spillover radiation. Elekta's strength is severely undermined by the amount of precedent innovation in this area, especially as large firms including Siemens, General Electric, and Fonar have strong prior art around the device.

Below, find a graph showing the top 25 patent holders in this innovation space.

Top 25 Assignee Names by Document Holding Count

- 1) Fonar Corporation -- 138
- 2) Siemens -- 136
- 3) General Electric -- 106
- 4) Kabushiki Kaisha Toshiba -- 39
- 5) Loma Linda University Medical Center -- 38
- 6) Elekta -- 34
- 7) Oraya Therapeutics, Inc. -- 30
- 8) Hitachi, Ltd. -- 29
- 9) Wisconsin Alumni Research Foundation -- 27
- 10) Varian Medical Systems, Inc. -- 23
- 11) Mitsubishi Denki Kabushiki Kaisha -- 23
- 12) BrainLAB AG -- 22
- 13) Gesellschaft fuer Schwerionenforschung -- 21
- 14) Accuray, Inc. -- 21
- 15) RUCHALA KENNETH J -- 20
- 16) University of California -- 19
- 17) Varian -- 18
- 18) OLIVERA GUSTAVO H -- 17
- 19) Koninklijke Philips Electronics N.V. -- 17
- 20) The Invention Science Fund I, LLC -- 16
- 21) LU WEIGUO -- 16
- 22) Hill-Rom Services, Inc. -- 16
- 23) BSD Medical Corporation -- 15
- 24) SCHNARR ERIC -- 14
- 25) MACKIE THOMAS R -- 13

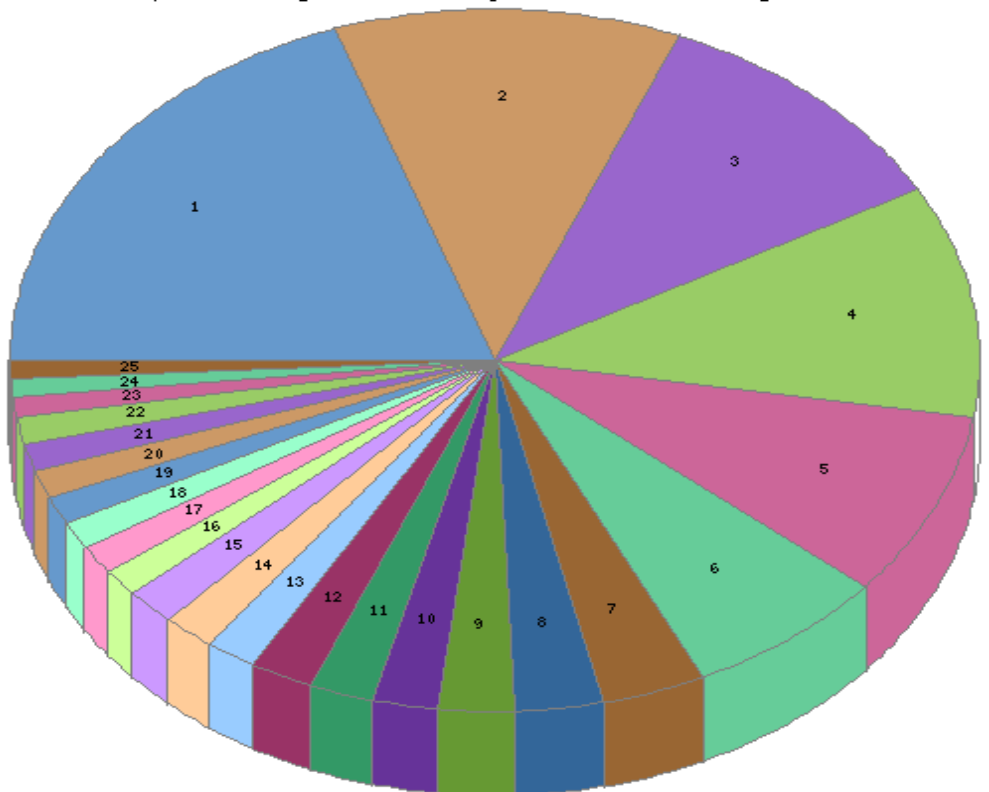


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Elekta's US patent 6,714,627 is for a dual collimator which enables a faster and more thorough radiation of the targeted area, and is severely impaired by US patents 5,012,506 and 5,207,223 held by the Wisconsin Alumni Research Foundation and Accuray Inc. respectively. Again, the innovation space around the Elekta patent is occupied by industry leaders like Siemens, Varian, and General Electric. Below find a graph showing the players in this space.

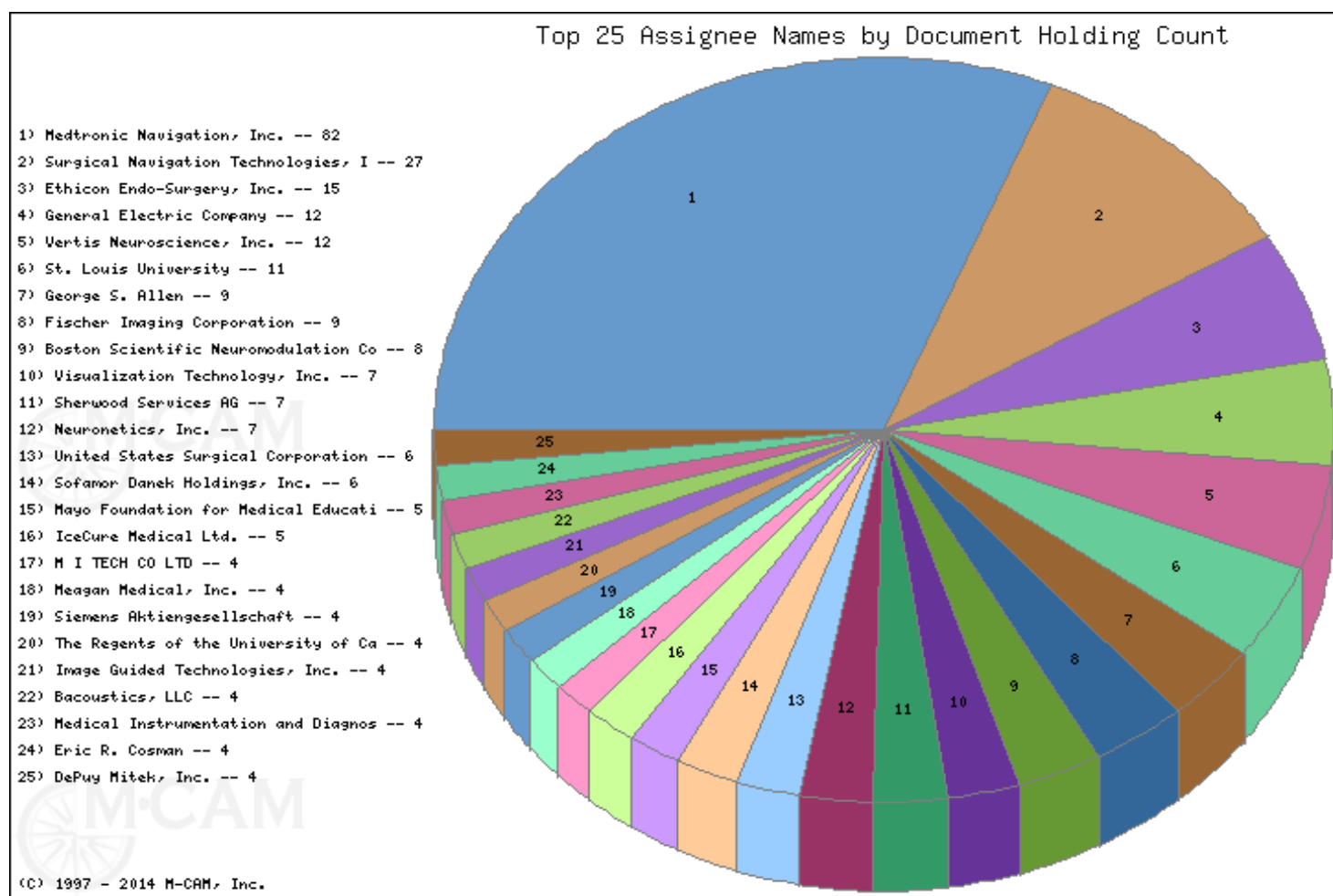
Top 25 Assignee Names by Document Holding Count

- 1) Siemens -- 46
- 2) Varian Associates, Inc. -- 27
- 3) Elekta AB (publ) -- 25
- 4) Kabushiki Kaisha Toshiba -- 25
- 5) Wisconsin Alumni Research Foundation -- 20
- 6) General Electric Company -- 16
- 7) Accuray Incorporated -- 8
- 8) Sherwood Services AG -- 7
- 9) Nomos Corporation -- 6
- 10) International Business Machines Corp -- 5
- 11) Massachusetts Institute of Technology -- 5
- 12) FALCO TONY -- 5
- 13) Surgical Navigation Technologies, I -- 4
- 14) BrainLAB AG -- 4
- 15) Eric R. Cosman -- 4
- 16) Resonant Medical, Inc. -- 3
- 17) TomoTherapy Incorporated -- 3
- 18) Deutsches Krebsforschungszentrum St -- 3
- 19) Moshe Ein-Gal -- 3
- 20) BROWN KEVIN JOHN -- 3
- 21) Hologic, Inc. -- 3
- 22) Koninklijke Philips Electronics, N.V. -- 3
- 23) Sonotron Ltd. -- 2
- 24) BC Cancer Agency -- 2
- 25) William Beaumont Hospital -- 2

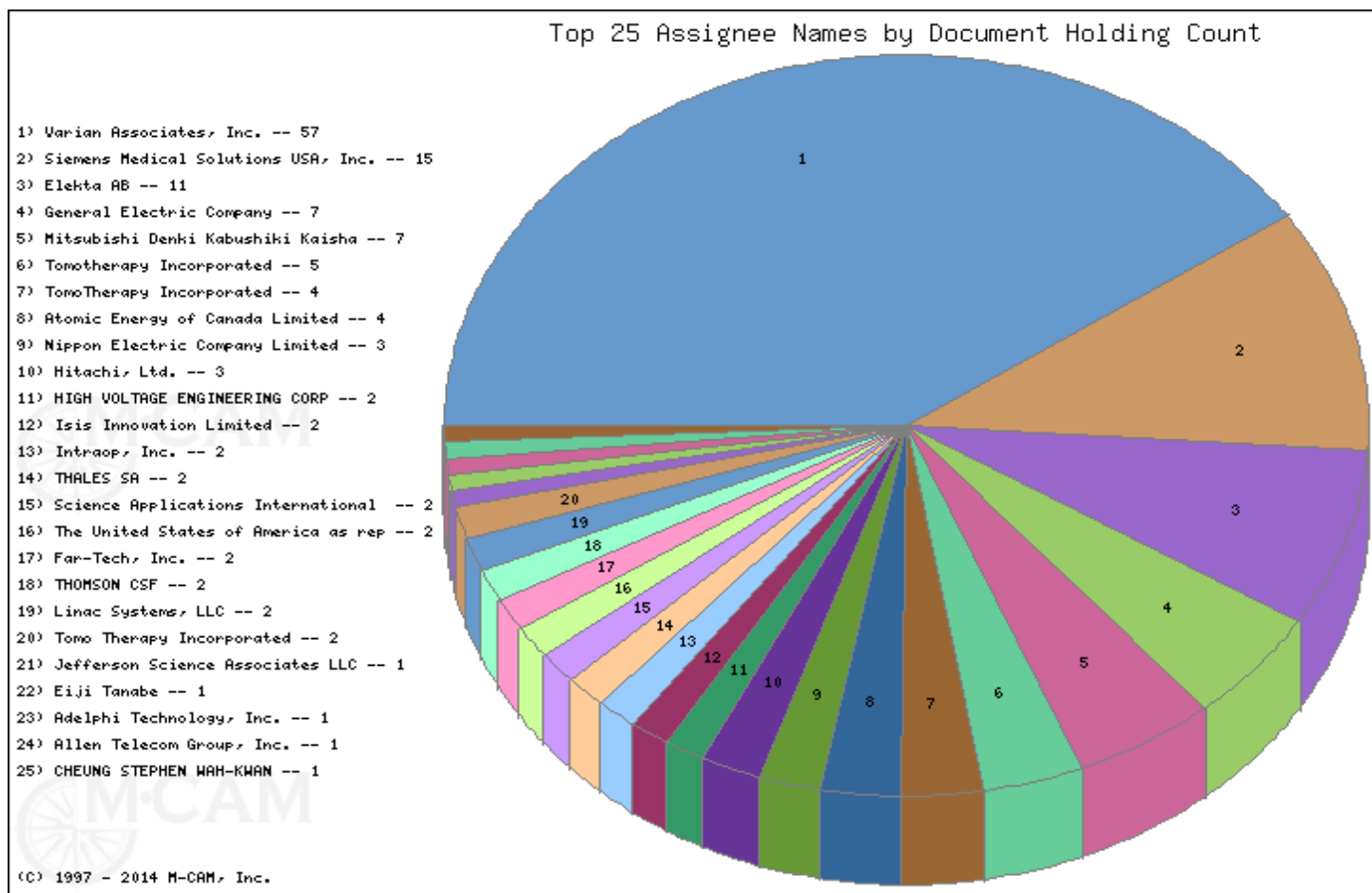


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Elekta's US patent 6,283,977 is a stereotactic apparatus that is used as a three-dimensional coordinate system to locate small targets inside the patient's body for minimally invasive surgical treatment. In line with Elekta's other "innovations," this patent was granted for a device that has much precedent innovation. US patent 5,643,286, owned by Neurotech USA, Inc., is very similar and has a priority date of 24 June, 1994. Elekta appears to have been issued a patent for something that was already invented by somebody else. There are, of course, many patent holders in this innovation space, all preceding Elekta's patent. Below is a graph of the major stake holders in stereotactic equipment.



Finally, Elekta's US patent 6,376,990 is for a linear accelerator that relies on varying the radio frequency field in multiple cavities to operate successfully over a wide range of energies. This patent is impaired by US patents 4,286,192, 4,629,938, and 5,381,072, all owned by Varian Associates, Inc. which deal substantially with standing wave, variable energy linear accelerators. Elekta has, once again, been issued a superfluous patent on technology that already existed. Below find a graph of other major stake holders in this innovation space.



Market Analysis

The potential downside of Elekta's weak intellectual property portfolio is material. In April 2012 Varian Medical Systems was ordered to pay \$73.6 million for their infringement of patents held by the University of Pittsburgh. Varian's Clinac® and Trilogy® linear accelerators were ruled to have been in part produced based off of innovations originating at the university. It is extremely likely that if one of the other industry incumbents were to pursue Elekta for infringement a similar story could unfold.

Elekta sought to strengthen their portfolio through the 1997 acquisition of Philips Medical Systems, but the acquired portfolio has significant problems. The majority of the acquired patents have lapsed or been abandoned, and the few that are still in force are themselves quite impaired. Likewise, Elekta's 2003 acquisition of Neuromag netted them an unimpressive portfolio with extremely limited protection. Resonant Medical is another Elekta acquisition, in 2010, that produced underwhelming benefits for the company. Eletka may have been the beneficiary of the technology these companies possessed, but it remains in a position of vulnerability if challenged on the market protection of its products.

Another wrinkle in the Elekta story is their recent expansion in South America, namely Brazil. In June of 2012, Elekta acquired Radon Ltda. Group, a linear accelerator service company located in Brazil. Elekta saw the acquisition as a 25% increase in their customer base in Brazil, but almost all installed linear accelerators in Brazil are General Electric or Siemens products. This acquisition is less vertical expansion and more horizontal expansion, as Radon will be working on the infrastructure owned by Elekta's competitors, if those competitors choose to use Radon at all.

Conclusion

Over half of Elekta's business revenue is in oncology care, and it is becoming clear that Elekta has insufficient proprietary market controls to justify its rosy future outlook. With over one-third of their business originating in the Americas, it is useful to know how outmatched they are in these markets. Seimens, Varian, Accuray, and General Electric all have effective intellectual properties that could be deployed against Elekta at any time.

As Elekta enters new markets and attempts to take market share from the industry leaders, expect those leaders to take notice and act accordingly. Just one patent infringement case decided negatively against a company can significantly diminish its future prospects, and Elekta is open to more than just one.

For a more detailed examination of the patents mentioned in this report, please contact us at patentlyobvious@m-cam.com.

Appendix A

Sample of Prior Art for Elekta's US patent 5,983,424

Document #	Title	Assignee Name	Priority	File	Issue
US4688780	Patient support	Siemens Gammasonics, Inc.	31-Mar-86	31-Mar-86	25-Aug-87
US5647360	Digital subtraction angiography for 3D diagnostic imaging	Siemens Corporate Research, Inc.	30-Jun-95	30-Jun-95	15-Jul-97
US5638419	Spiral-helical scan computed tomography apparatus	Siemens Aktiengesellschaft	16-Feb-95	5-Jan-96	10-Jun-97
US5574763	Computed tomography apparatus	Siemens Aktiengesellschaft	21-Feb-94	31-Jan-95	12-Nov-96
US5471142	Circularly polarized local antenna arrangement for a nuclear magnetic resonance tomography apparatus and method for operating same	Siemens Aktiengesellschaft	30-Sep-92	24-Sep-93	28-Nov-95
US5361436	Patient support apparatus for medical examinations	Siemens Aktiengesellschaft	2-Sep-92	17-Aug-93	8-Nov-94
US5343048	Contour collimator for radiation therapy	Siemens Aktiengesellschaft	7-Feb-92	1-Feb-93	30-Aug-94
US5247556	Method and apparatus of operating a computer tomography apparatus to simultaneously obtain an x-ray shadowgraph and a tomographic exposure	Siemens Aktiengesellschaft	6-Feb-91	29-Jan-92	21-Sep-93
US5153517	Surface resonator for a magnetic resonance imaging apparatus	Siemens Aktiengesellschaft	12-Dec-89	12-Dec-90	6-Oct-92
US5046708	Patient supporting table having a support plate adjustable in the direction of the longitudinal axis of the patient supporting table	Siemens Aktiengesellschaft	30-Jun-89	18-Jun-90	10-Sep-91
US5044354	Apparatus for treating a life form with focussed shockwaves	Siemens Aktiengesellschaft	30-Jun-89	29-Jun-90	3-Sep-91
US4819257	Lithotripsy work station	Siemens Aktiengesellschaft	19-Sep-86	21-Sep-87	4-Apr-89
US4796613	Lithotripsy work station	Siemens Aktiengesellschaft	9-Oct-85	26-Sep-86	10-Jan-89
US4795142	Patient supporting table	Siemens Aktiengesellschaft	20-Mar-86	1-Apr-88	3-Jan-89
US4749177	Patient supporting table	Siemens Aktiengesellschaft	20-Mar-86	16-Mar-87	7-Jun-88
US4697802	X-ray diagnostics installation including a tilting table	Siemens Aktiengesellschaft	5-May-86	29-Dec-86	6-Oct-87
US4579323	X-ray diagnostic device having a tiltable table	Siemens Aktiengesellschaft	5-Dec-83	29-Oct-84	1-Apr-86
US4455667	Radiation diagnostic device for generating tomographic images	Siemens Aktiengesellschaft	9-Aug-78	20-Feb-81	19-Jun-84
US5680861	Modular subject positioning system for medical imaging	General Electric Company	8-Jul-96	8-Jul-96	28-Oct-97
US5657498	Methods and apparatus for acquiring table elevation information	General Electric Company	20-Nov-95	20-Nov-95	19-Aug-97
US5579358	Compensation for movement in computed tomography equipment	General Electric Company	26-May-95	26-May-95	26-Nov-96
US5577502	Imaging of interventional devices during medical procedures	General Electric Company	3-Apr-95	3-Apr-95	26-Nov-96
US5505203	Method and apparatus for automatic transducer selection in ultrasound imaging system	General Electric Company	23-Nov-94	23-Nov-94	9-Apr-96
US5436607	Open (non-enclosed) magnets for magnetic resonance imaging	General Electric Company	5-Aug-92	11-Jul-94	25-Jul-95
US5323779	Heat surgery system monitored by real-time magnetic resonance temperature profiling	General Electric Company	26-Mar-93	8-Dec-93	28-Jun-94
US5317298	Apparatus and method for passive shimming of a superconducting magnet which images human limbs	General Electric Company	4-Jan-93	4-Jan-93	31-May-94
US5291890	Magnetic resonance surgery using heat waves produced with focussed ultrasound	General Electric Company	29-Aug-91	29-Aug-91	8-Mar-94
US5290266	Flexible coating for magnetic resonance imaging compatible invasive devices	General Electric Company	14-Aug-92	14-Aug-92	1-Mar-94
US5274332	Inductively coupled multi-section radio frequency field coil for NMR	General Electric Company	14-Nov-83	14-Nov-83	28-Dec-93
US5211165	Tracking system to follow the position and orientation of a device with radiofrequency field gradients	General Electric Company	3-Sep-91	3-Sep-91	18-May-93
US5153546	Open MRI magnet	General Electric Company	3-Jun-91	3-Jun-91	6-Oct-92
US4924198	Superconductive magnetic resonance magnet without cryogens	General Electric Company	5-Jul-88	5-Jul-88	8-May-90
US4744627	Optical fiber holder	General Electric Company	3-Nov-86	3-Nov-86	17-May-88
US4629989	Patient alignment system for NMR studies	General Electric Company	10-Nov-83	10-Nov-83	16-Dec-86
US4400820	Axial tomography head holder	General Electric Company	30-Sep-82	30-Sep-82	23-Aug-83

Appendix B

Sample of Prior Art for Elekta's US patent 6,714,627

Document #	Title	Assignee Name	Priority	File	Issue
US5724400	Radiation therapy system with constrained rotational freedom	Wisconsin Alumni Research Foundation	19-Mar-92	25-Jan-96	3-Mar-98
US5673300	Method of registering a radiation treatment plan to a patient	Wisconsin Alumni Research Foundation	11-Jun-96	11-Jun-96	30-Sep-97
US5668371	Method and apparatus for proton therapy	Wisconsin Alumni Research Foundation	6-Jun-95	1-Oct-96	16-Sep-97
US5661773	Interface for radiation therapy machine	Wisconsin Alumni Research Foundation	2-Feb-94	7-Jun-95	26-Aug-97
US5625663	Dynamic beam flattening apparatus for radiation therapy	Wisconsin Alumni Research Foundation	19-Mar-92	11-Aug-95	29-Apr-97
US5548627	Radiation therapy system with constrained rotational freedom	Wisconsin Alumni Research Foundation	19-Mar-92	9-Jun-93	20-Aug-96
US5442675	Dynamic collimator for radiation therapy	Wisconsin Alumni Research Foundation	19-Mar-92	9-Jun-93	15-Aug-95
US5394452	Verification system for radiation therapy	Wisconsin Alumni Research Foundation	19-Mar-92	9-Jun-93	28-Feb-95
US5351280	Multi-leaf radiation attenuator for radiation therapy	Wisconsin Alumni Research Foundation	19-Mar-92	9-Jun-93	27-Sep-94
US6198957	Radiotherapy machine including magnetic resonance imaging system	Varian, Inc.	19-Dec-97	19-Dec-97	6-Mar-01
US5692507	Computer tomography apparatus using image intensifier detector	Varian Associates, Inc.	20-Jul-90	7-Dec-94	2-Dec-97
US5166531	Leaf-end configuration for multileaf collimator	Varian Associates, Inc.	5-Aug-91	5-Aug-91	24-Nov-92
US5117445	Electronically enhanced X-ray detector apparatus	Varian Associates, Inc.	2-Jul-90	2-Jul-90	26-May-92
US4987309	Radiation therapy unit	Varian Associates, Inc.	29-Nov-88	22-Nov-89	22-Jan-91
US4868844	Multileaf collimator for radiotherapy machines	Varian Associates, Inc.	7-Mar-88	7-Mar-88	19-Sep-89
US4726046	X-ray and electron radiotherapy clinical treatment machine	Varian Associates, Inc.	5-Nov-85	5-Nov-85	16-Feb-88
US4233519	Radiation therapy apparatus having retractable beam stopper	Varian Associates, Inc.	18-Jun-79	18-Jun-79	11-Nov-80
US5291889	Apparatus and method for spatially positioning images	Vanguard Imaging Ltd.	23-May-91	23-May-91	8-Mar-94
EP0562644	Multileaf collimator and compensator for radiotherapy machines	VARIAN ASSOCIATES, INC.	10-Sep-86	17-Aug-87	24-Jun-98
EP0489906	RADIATION THERAPY SIMULATOR MACHINE	VARIAN ASSOCIATES, INC.	2-Jul-90	2-Jul-91	19-Mar-97
WO9200656	ELECTRONICALLY ENHANCED XRAY DETECTOR APPARATUS	VARIAN ASSOCIATES INC	2-Jul-90	2-Jul-91	9-Jan-92
US3777124	COMPUTER ASSISTED RADIATION THERAPY MACHINE	VARIAN ASSOCIATES	27-Nov-70	27-Nov-70	4-Dec-73
US3767931	ADJUSTABLE X-RAY BEAM COLLIMATOR WITH SHUTTER FOR ILLUMINATION OF THE RADIATION PATTERN	VARIAN ASSOCIATES	14-Nov-72	14-Nov-72	23-Oct-73
US3539813	BEAM WIDTH DEFINING STRUCTURE FOR LINEAR ACCELERATOR RADIOTHERAPY DEVICES	VARIAN ASSOCIATES	24-Nov-67	24-Nov-67	10-Nov-70
US5591983	Multiple layer multileaf collimator	Siemens Medical Systems, Inc.	30-Jun-95	30-Jun-95	7-Jan-97
US5446548	Patient positioning and monitoring system	Siemens Medical Systems, Inc.	8-Oct-93	8-Oct-93	29-Aug-95
US5332908	Method for dynamic beam profile generation	Siemens Medical Laboratories, Inc.	31-Mar-92	11-Feb-93	26-Jul-94
US5165106	Contour collimator	Siemens Medical Laboratories, Inc.	6-Jun-91	6-Jun-91	17-Nov-92
US5138647	Portal imaging device	Siemens Medical Laboratories, Inc.	3-Aug-90	3-Aug-90	11-Aug-92
US5757881	Redundant field-defining arrays for a radiation system	Siemens Business Communication Systems, Inc.	6-Jan-97	6-Jan-97	26-May-98

Appendix C

Sample of Prior Art for Elekta's US patent 6,283,977

Document #	Title	Assignee Name	Priority	File	Issue
US5803912	Positioning function mammographic biopsy function system with offset	Fischer Imaging Corporation	27-Nov-91	25-Apr-95	8-Sep-98
US5776062	Enhanced breast imaging/biopsy system employing targeted ultrasound	Fischer Imaging Corporation	15-Oct-96	15-Oct-96	7-Jul-98
US5735264	Motorized mammographic biopsy apparatus	Fischer Imaging Corporation	21-Nov-89	7-Jun-95	7-Apr-98
US5415169	Motorized mammographic biopsy apparatus	Fischer Imaging Corporation	21-Nov-89	17-Feb-93	16-May-95
US5386447	Mammographic screening and biopsy apparatus	Fischer Imaging Corporation	23-Sep-92	23-Sep-92	31-Jan-95
US5078142	Precision mammographic needle biopsy system	Fischer Imaging Corporation	21-Nov-89	21-Nov-89	7-Jan-92
US5354314	Three-dimensional beam localization apparatus and microscope for stereotactic diagnoses or surgery mounted on robotic type arm	Medical Instrumentation and Diagnostics Corporation	23-Dec-88	28-Aug-92	11-Oct-94
US5176689	Three-dimensional beam localization apparatus for stereotactic diagnoses or surgery	Medical Instrumentation and Diagnostics Corporation	27-Oct-87	11-Jul-90	5-Jan-93
US5640496	Method and apparatus for management of image data by linked lists of pixel values	Medical Instrumentation and Diagnostics Corp.	4-Feb-91	4-Feb-91	17-Jun-97
US5339812	Three-dimensional computer graphics simulation and computerized numerical optimization for dose delivery and treatment planning	Medical Instrumentation and Diagnostic Corporation	23-Dec-88	14-Dec-92	23-Aug-94
US4989601	Method, apparatus, and substance for treating tissue having neoplastic cells	Medical Engineering & Development Institute, Inc.	21-Jan-83	22-Sep-88	5-Feb-91
US4706665	Frame for stereotactic surgery	Kasim I. Gouda	17-Dec-84	17-Dec-84	17-Nov-87
US5080662	Spinal stereotaxic device and method	Kamaljit S. Paul	27-Nov-89	27-Nov-89	14-Jan-92
US5056523	Precision breast lesion localizer	Board of Regents, The University of Texas System	22-Nov-89	22-Nov-89	15-Oct-91
US5147372	Biopsy arc means and the use of the same	Bernt Nymark	13-Jul-88	11-Jan-91	15-Sep-92
US5280427	Puncture guide for computer tomography	Bard International, Inc.	27-Nov-89	27-Nov-90	18-Jan-94
US5891034	System for indicating the position of a surgical probe within a head on an image of the head	St. Louis University	19-Oct-90	7-Jun-95	6-Apr-99
US5871445	System for indicating the position of a surgical probe within a head on an image of the head	St. Louis University	26-Apr-93	7-Sep-95	16-Feb-99
US5851183	System for indicating the position of a surgical probe within a head on an image of the head	St. Louis University	19-Oct-90	16-Oct-95	22-Dec-98
US5383454	System for indicating the position of a surgical probe within a head on an image of the head	St. Louis University	19-Oct-90	2-Jul-92	24-Jan-95
US5967980	Position tracking and imaging system for use in medical applications	Visualization Technology, Inc.	15-Sep-94	17-Dec-96	19-Oct-99
US5873822	Automatic registration system for use with position tracking and imaging system for use in medical applications	Visualization Technology, Inc.	15-Sep-94	24-Apr-96	23-Feb-99
US5829444	Position tracking and imaging system for use in medical applications	Visualization Technology, Inc.	15-Sep-94	15-Sep-94	3-Nov-98
US5800352	Registration system for use with position tracking and imaging system for use in medical applications	Visualization Technology, Inc.	15-Sep-94	24-Apr-96	1-Sep-98
US4583537	Convergent multibeam unit for radiation	Victor E. Derechinsky	18-Nov-81	12-Nov-82	22-Apr-86
GB0286627	Improvements in or relating to fittings for securing the working parts of agricultural implements	VILHELM ERHARD FREDERIKSEN	5-Mar-27	5-Mar-28	20-Dec-28
US5242455	Imaging fixation and localization system	University of Pittsburgh	3-May-91	3-May-91	7-Sep-93
US4998938	Removable skull mounted work platform and method of assembling same	Neurodynamics, Inc.	9-Jun-88	9-Jun-88	12-Mar-91
US5306272	Advancer for surgical instrument	Neuro Navigational Corporation	2-Nov-92	2-Nov-92	26-Apr-94

Appendix D

Sample of Prior Art for Elekta's US patent 6,376,990

Document #	Title	Assignee Name	Priority	File	Issue
US5381072	Linear accelerator with improved input cavity structure and including tapered drift tubes	Varian Associates, Inc.	25-Feb-92	25-Feb-92	10-Jan-95
US4988919	Small-diameter standing-wave linear accelerator structure	Varian Associates, Inc.	13-May-85	8-Feb-88	29-Jan-91
US4629938	Standing wave linear accelerator having non-resonant side cavity	Varian Associates, Inc.	29-Mar-85	29-Mar-85	16-Dec-86
US4382208	Variable field coupled cavity resonator circuit	Varian Associates, Inc.	28-Jul-80	28-Jul-80	3-May-83
US4286192	Variable energy standing wave linear accelerator structure	Varian Associates, Inc.	12-Oct-79	12-Oct-79	25-Aug-81
US4146817	Standing wave linear accelerator and slotted waveguide hybrid junction input coupler	Varian Associates, Inc.	14-Mar-77	14-Mar-77	27-Mar-79
US4118653	Variable energy highly efficient linear accelerator	Varian Associates, Inc.	22-Dec-76	22-Dec-76	3-Oct-78
DE3038414	LINEARER STEHWELLENBESCHLEUNIGER	VARIAN ASSOCIATES INC PALO ALTO CALIF US	12-Oct-79	10-Oct-80	23-Apr-81
DE3129688	RESONATORSCHALTREIS MIT GEKOPPELTEN HOHLRAEUMEN UND VARIABLEM FELD, INSBESONDERE PARTIKELBESCHLEUNIGER	VARIAN ASSOCIATES INC 94303 PALO ALTO CALIF US	28-Jul-80	28-Jul-81	19-May-82
US3820035	MICROWAVE AUTOMATIC FREQUENCY CONTROL CIRCUIT	VARIAN ASSOCIATES	26-Feb-73	26-Feb-73	25-Jun-74
US3811065	VELOCITY MODULATION MICROWAVE TUBE EMPLOYING A HARMONIC PREBUNCHER FOR IMPROVED EFFICIENCY	VARIAN ASSOCIATES	15-Oct-68	14-Feb-73	14-May-74
US3614518	MICROWAVE TUNER HAVING SLIDING CONTACTORS	VARIAN ASSOCIATES	16-Mar-70	16-Mar-70	19-Oct-71
US3546524	LINEAR ACCELERATOR HAVING THE BEAM INJECTED AT A POSITION OF MAXIMUM R.F. ACCELERATING FIELD	VARIAN ASSOCIATES	24-Nov-67	24-Nov-67	8-Dec-70
US3463959	CHARGED PARTICLE ACCELERATOR APPARATUS INCLUDING MEANS FOR CONVERTING A ROTATING HELICAL BEAM OF CHARGED PARTICLES HAVING AXIAL MOTION INTO A NONROTATING BEAM OF CHARGED PARTICLES	VARIAN ASSOCIATES	25-May-67	25-May-67	26-Aug-69
US3456207	INTEGRAL CAVITY MULTICAVITY LINEAR BEAM AMPLIFIER HAVING MEANS FOR APPLYING A D.C. VOLTAGE ACROSS THE INTERACTION GAPS	VARIAN ASSOCIATES	10-Oct-66	10-Oct-66	15-Jul-69
US4122342	X-ray and gamma ray waveguide, cavity and method	University of Utah Research Institute	13-Apr-77	13-Apr-77	24-Oct-78
DE3616879	OPTISCH ELEKTRONENBESCHLEUNIGER GEPULSTER	UNITED STATES DEPARTMENT OF ENERGY WASHINGTON DC US	20-May-85	20-May-86	20-Nov-86
GB2175738	OPTICALLY PULSED ELECTRON ACCELERATOR FOR LASER	UNITED STATES DEPARTMENT OF ENERGY	20-May-85	7-May-86	3-Dec-86
US5132593	Microwave electron gun	Mitsubishi Denki Kabushiki Kaisha	4-Aug-88	9-Oct-91	21-Jul-92
US5039910	Standing-wave accelerating structure with different diameter bores in bunching and regular cavity sections	Mitsubishi Denki Kabushiki Kaisha	22-May-87	20-May-88	13-Aug-91
US5029259	Microwave electron gun	Mitsubishi Denki Kabushiki Kaisha	4-Aug-88	26-Jul-89	2-Jul-91
US4651057	Standing-wave accelerator	Mitsubishi Denki Kabushiki Kaisha	9-Feb-84	7-Feb-85	17-Mar-87
US5434420	Industrial material processing electron linear accelerator	Atomic Energy of Canada Limited	4-Dec-92	17-Mar-94	18-Jul-95
US4155027	S-Band standing wave accelerator structure with on-axis couplers	Atomic Energy of Canada Limited	9-May-77	14-Oct-77	15-May-79
US4027193	Klystron-resonant cavity accelerator system	Atomic Energy of Canada Limited	4-Mar-74	26-Apr-76	31-May-77
US4006422	Double pass linear accelerator operating in a standing wave mode	Atomic Energy of Canada Limited	1-Aug-74	3-Mar-75	1-Feb-77

M·CAM's Patent Glossary

<u>Aligned Sector:</u>	The business sector in which the product(s) resulting from the patent(s) is currently or intended to be sold.
<u>Applicant:</u>	The person or corporation that applies for a patent with the intent to use, manufacture or license the technology of the invention; under U.S. law, except in special situations, the applicant(s) must be the inventor(s).
<u>Application:</u>	Complete papers submitted to the U. S. Patent and Trademark Office seeking a patent including oath, specification, claims, and drawings. This usually does not signify a Provisional Patent Application, but only a regular patent application.
<u>Art:</u>	The established practice and public knowledge within a given field of technology. This also identifies a process or method used to produce a useful result. A term used in consideration of the problem of patentable novelty encompassing all that is known prior to the filing date of the application in the particular field of the invention.
<u>Assignee:</u>	The person(s) or corporate body to whom the law grants or vests a patent right. This refers to the person or corporate entity that is identified as the receiver of an assignment.
<u>Business Method</u>	
<u>Patent:</u>	A patent that controls the way a business process is undertaken. The issuance of these patents by the United States Patent and Trademark Office (USPTO) is new and controversial, since many allege that it is unfair to allow a patent on a way of doing business.
<u>Citation:</u>	This may include patents or journal articles that the applicant or examiner deems relevant to a current application. A reference to legal authorities or a prior art documentation are examples of a citation.
<u>Claim:</u>	The language in a patent application that defines the legal scope of the patent. Most patents have numerous claims. This is typically the single most important section in the application.
<u>Concurrent Art:</u>	Concurrent art occurs when related patent applications are being examined by the USPTO at the same time. It is difficult for any company or inventor to know, at the time they file for a patent, whether a “related” patent application exists.
<u>Filing Date:</u>	The date when a properly prepared application reaches the patent office in complete form.
<u>Innovation Cycle:</u>	A description of the commercialization timeframe for the intellectual property.
<u>Innovation Space:</u>	M·CAM’s representation of the innovation(s) that occur before, during, and after the pending period of the subject patent. The innovation space is the first place to look for patents that are closely related to the subject patent and that may impact the defensibility of the subject patent or create opportunities for patent licensing.
<u>Issue Date:</u>	Not to be confused with the filing date, which is the date the patent application was physically received by the U.S. Patent and Trademark Office. This is the date on which the patent actually issues.
<u>Non-Aligned</u>	
<u>Sector:</u>	Any sector in which the patent can be used or sold, other than the sector for which the patent or resultant product was invented or intended.
<u>Pod:</u>	A group of patents owned by a company that should be treated as a single unit of innovation (e.g., a certain group of patents that comprise a single product or multiple related products).
<u>Prior Art:</u>	Any relevant patent that was issued before the patent being analyzed. If this previous patent was specifically mentioned in the new patent’s application, the previous patent is referred to as “cited prior art”. If it was NOT mentioned, then that previous patent is referred to as “uncited prior art”.
<u>Subsequent Art:</u>	Any patent that has a filing date with the USPTO that is after the issuance date of the subject patent. This subsequent art patent may or may not have cited (see “Citation” above) the subject patent. As subsequent art represents more recent innovation than the subject patent, it has great potential to shrink the market opportunity for the subject patent.

A Brief Primer on the Patent System

In recent years, the importance of patents and intellectual property rights as an important variable in the marketplace has come to the forefront of the public consciousness as world leaders declare their country's lead in the innovation race. Damaging intellectual property litigation is becoming increasingly common across all industries. This is exacerbated when patent rights are granted for non-novel ideas. A vast amount of precedent innovation is unconsidered by patent-granting authorities in the creation of new IP rights. Patent granting authorities including the United States Patent and Trademark Office (USPTO), European Patent Office (EPO), Japanese Patent Office (JPO), Chinese State Intellectual Property Office (SIPO), Korean Intellectual Property Office (KIPO) and many others are constrained by the use of patent classification systems which are routinely circumvented by patent applicants.

There is a two-way social contract underlying the patent system. In the United States, patent terms are generally limited to 20 years from the date of application. By statutory intention, once a patent has expired, the patent holder loses the right to exclude others from fully utilizing any innovation described in the patent. A large number of patents enter the public domain when they are "abandoned" – when owners discontinue paying patent maintenance fees. Patents also only provide an exclusionary right in the country for which the patent is filed. As demonstrated by the Global Innovation Commons¹ (G.I.C.), using intellectual property available in the public domain eliminates the need to pay licensing fees on those innovations in countries where the patent was never registered, or worldwide, if abandoned.

Patently Obvious® is a weekly report focusing on select groups of patents in order to increase transparency in markets, addressing information asymmetries, and providing a more level playing field for all parties.

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¹ <http://www.globalinnovationcommons.org/>