

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
12 February 2004 (12.02.2004)

PCT

(10) International Publication Number  
WO 2004/013883 A3

(51) International Patent Classification<sup>7</sup>: H01J 35/22

(21) International Application Number:  
PCT/US2003/024487

(22) International Filing Date: 5 August 2003 (05.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/213,624 6 August 2002 (06.08.2002) US

(71) Applicant: VARIAN MEDICAL SYSTEMS, INC.  
[US/US]; 3100 Hansen Way, Palo Alto, CA 94304 (US).

(72) Inventor: HANSEN, Wayne; 2113 North Rolling Hills  
Drive, Centerville, UT 84014 (US).

(74) Agents: MASCHOFF, Eric, L. et al.; Workman, Nydegger & Seeley, 1000 Eagle Gate Tower, 60 East South Temple, Salt Lake City, UT 84111 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

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

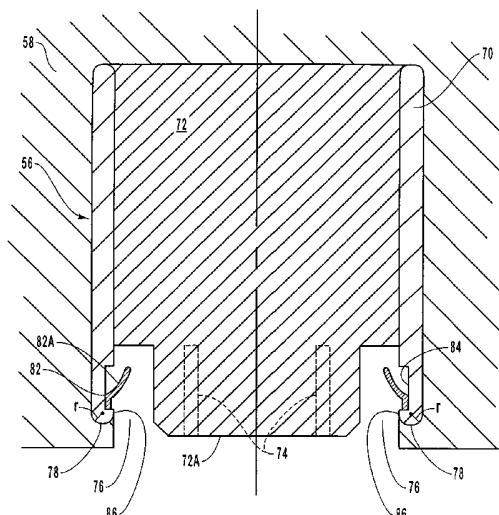
Published:

- 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

(88) Date of publication of the international search report:  
2 September 2004

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.

(54) Title: X-RAY TUBE HIGH VOLTAGE CONNECTOR



(57) Abstract: A high voltage connector assembly is disclosed for use with high power apparatus including x-ray devices. The present connector is a pancake-style connector, and interconnects a high voltage cable with the cathode of the x-ray tube. The present connector includes a housing, a socket assembly 56 and insulating material (58) surrounding the socket assembly to insulate it from the housing. The socket assembly comprises a potting-filled sleeve (70) having a continuously shaped, smooth terminal end (78). The terminal end of the sleeve forms a triple junction (86) with the insulating material and air present near the sleeve. The continuously smooth terminal sleeve end prevents electrical arcing to occur at the triple junction by reducing field strength at the terminal end and urging the electric field of the socket assembly away from the triple junction. The reduction in electrical arcing propensity allows the x-ray device to operate at relatively higher operating voltages.

WO 2004/013883 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/24487

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) : H01J 35/22 US CL : 378/121		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 378/121-144, 439/181		
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)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,806,113 A (Rate et al) 21.02.1989 See figures 2 and 3	1-28
<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	Date of mailing of the international search report	
25 May 2004 (25.05.2004)	20 JUL 2004	
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. (703) 305-3230	Authorized officer Craig E. Church Telephone No. 703-308-1234	