

(12) **United States Patent**
Watanabe

(10) **Patent No.:** **US 6,325,537 B1**
(45) **Date of Patent:** **Dec. 4, 2001**

(54) **X-RAY DIAGNOSIS APPARATUS** 5,052,036 * 9/1991 Grady 378/197
(75) **Inventor:** Naoto Watanabe, Nasu-gun (JP) 5,835,558 * 11/1998 Maschke 378/198
6,092,928 * 7/2000 Mattson et al. 378/98.2

(73) **Assignee:** Kabushiki Kaisha Toshiba, Kawasaki (JP) * cited by examiner

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Primary Examiner—Drew Dunn
(74) *Attorney, Agent, or Firm*—Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

(21) **Appl. No.:** 09/393,195

(57) **ABSTRACT**

(22) **Filed:** Sep. 10, 1999

An X-ray generator is rotatably attached to one end of a C-shaped arm, and a planar X-ray detector is attached to the other end of the C-shaped arm via a link mechanism capable of freely changing a position/direction of the detector. The X-ray generator is rotated to achieve imaging in an oblique direction, without sliding/rotating the C-shaped arm. The link mechanism is driven in association with the rotation of the X-ray generator so that the X-ray detector may face the X-ray generator. Thus, the limit to the slide angle range can substantially be eliminated without degrading accessibility, and various positioning is achieved exactly and easily.

(30) **Foreign Application Priority Data**

Oct. 16, 1998 (JP) 10-295526

(51) **Int. Cl.⁷** H05G 1/02; A61B 6/00

(52) **U.S. Cl.** 378/197; 378/196

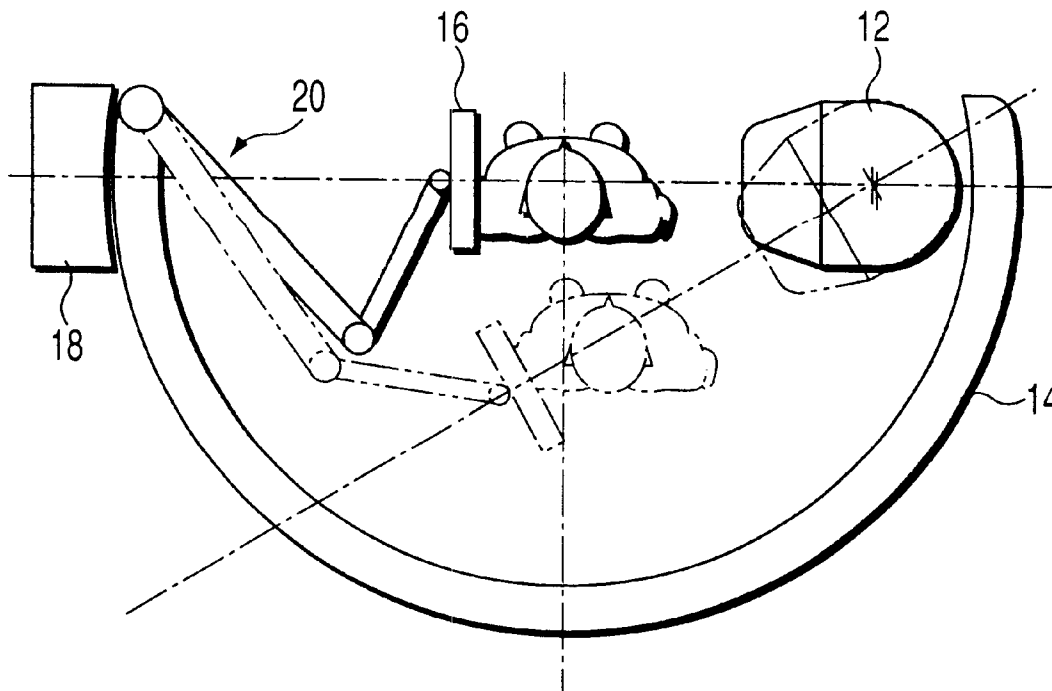
(58) **Field of Search** 378/197, 193, 378/196, 195, 198, 4, 20, 181

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,050,204 * 9/1991 Siczek et al. 378/197

28 Claims, 8 Drawing Sheets



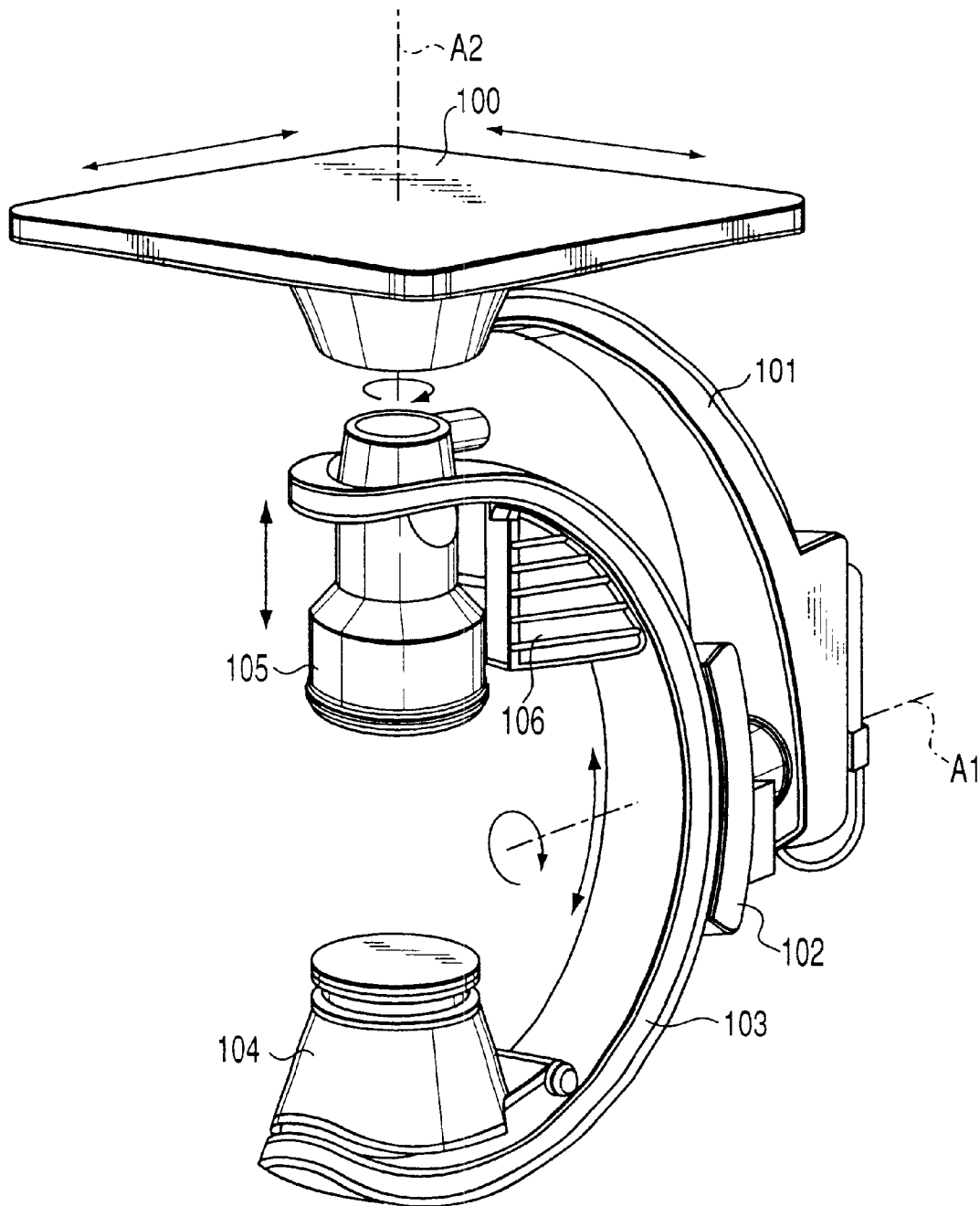


FIG. 1 PRIOR ART

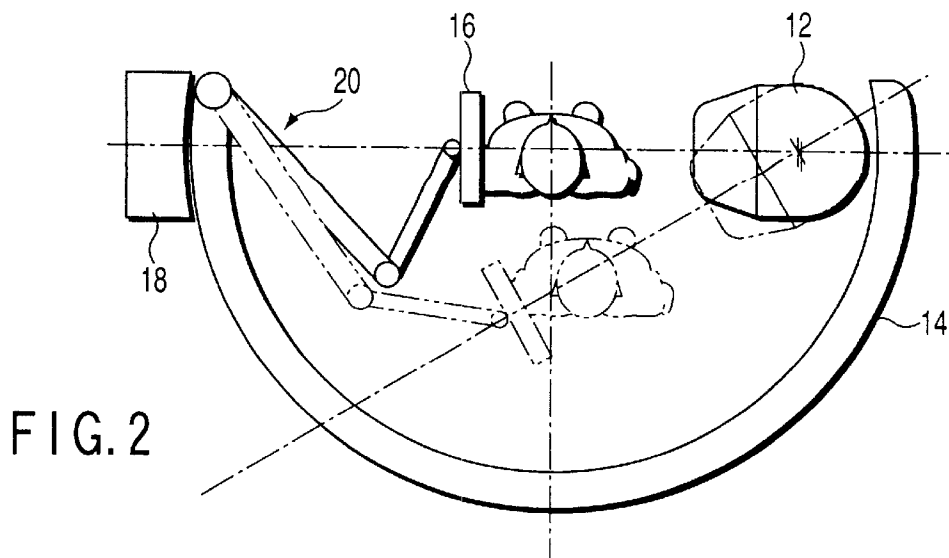


FIG. 2

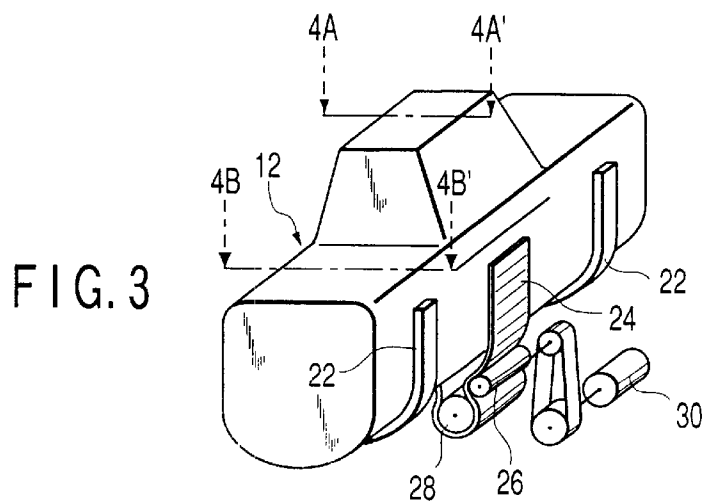


FIG. 3

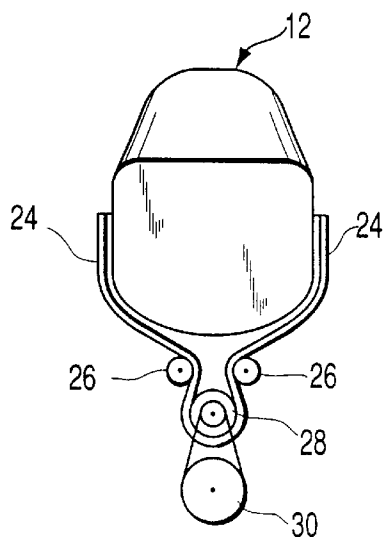


FIG. 4A

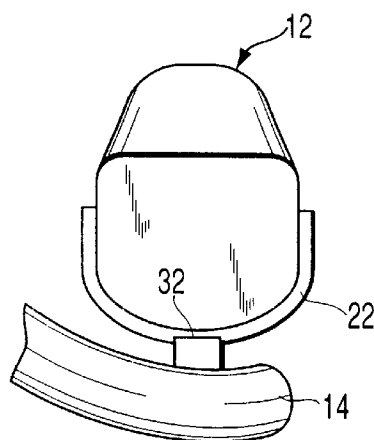


FIG. 4B

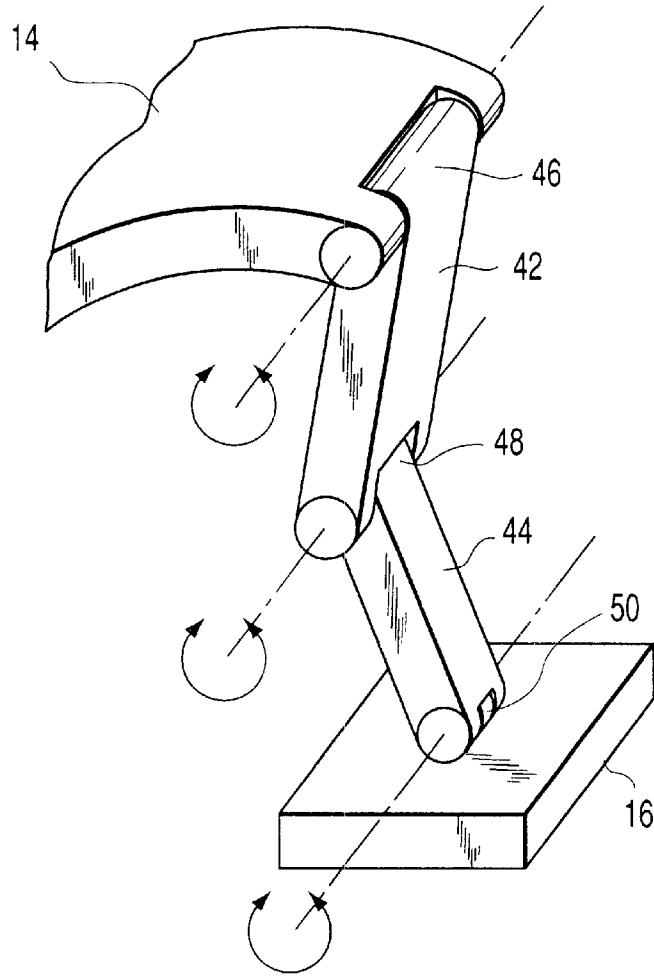


FIG. 5

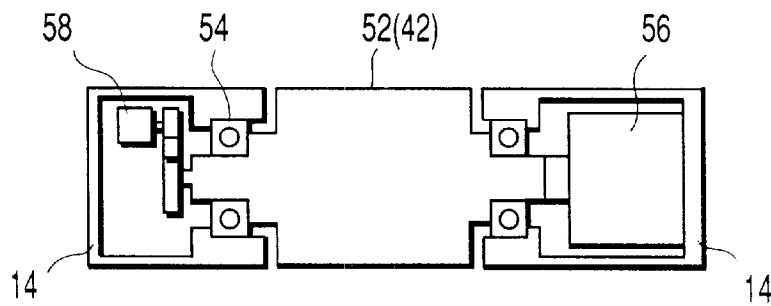
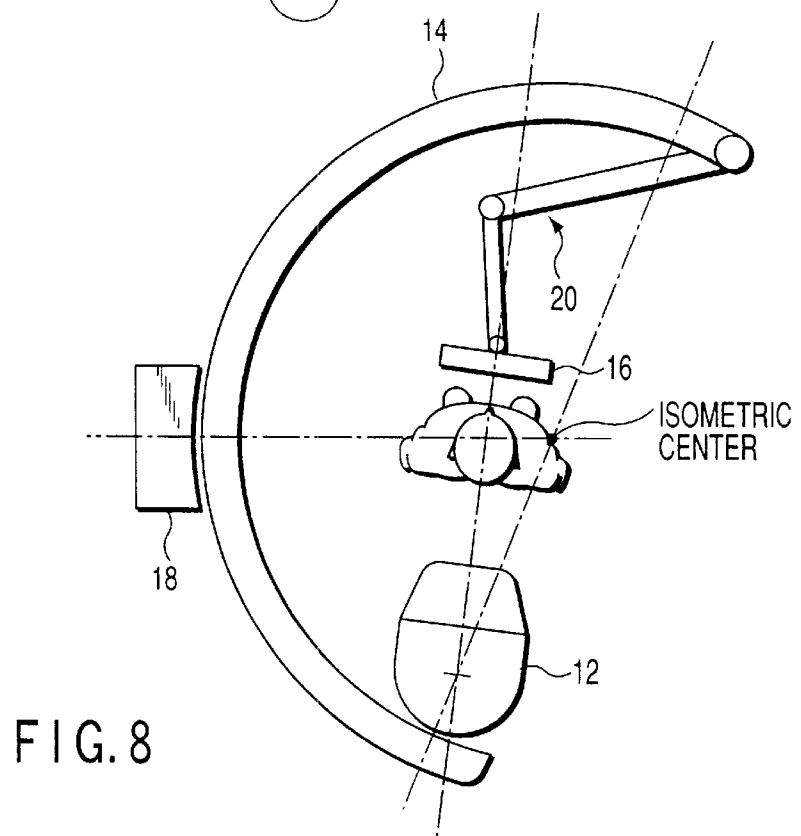
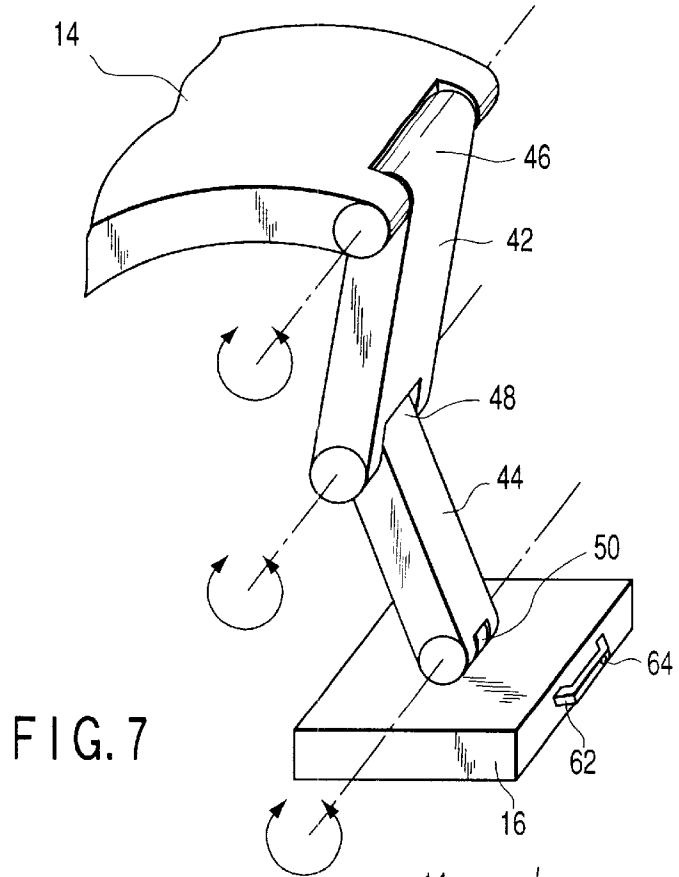


FIG. 6



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.