



US007524320B2

(12) **United States Patent**
Tierney et al.

(10) **Patent No.:** **US 7,524,320 B2**
(45) **Date of Patent:** ***Apr. 28, 2009**

(54) **MECHANICAL ACTUATOR INTERFACE SYSTEM FOR ROBOTIC SURGICAL TOOLS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1036 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/316,666**

(22) Filed: **Dec. 10, 2002**

(65) **Prior Publication Data**

US 2003/0083673 A1 May 1, 2003

Related U.S. Application Data

(60) Continuation of application No. 09/929,453, filed on Aug. 13, 2001, now Pat. No. 7,048,745, which is a division of application No. 09/418,726, filed on Oct. 15, 1999, now Pat. No. 6,331,181.

(60) Provisional application No. 60/111,713, filed on Dec. 8, 1998.

(51) **Int. Cl.**
A61B 19/00 (2006.01)

(52) **U.S. Cl.** **606/130; 606/1**

(58) **Field of Classification Search** **606/1, 606/130; 700/259, 260, 263**

See application file for complete search history.

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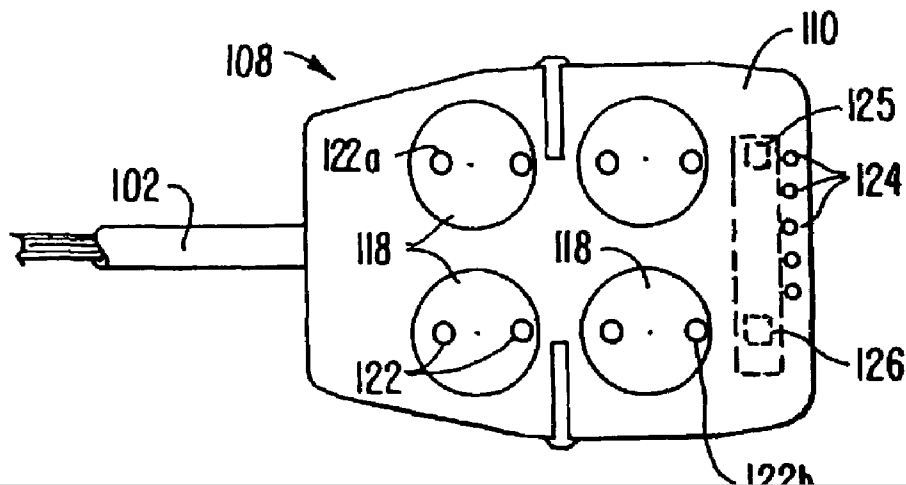
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(57) **ABSTRACT**

Robotic surgical tools, systems, and methods for preparing for and performing robotic surgery include a memory mounted on the tool. The memory can perform a number of functions when the tool is loaded on the tool manipulator: first, the memory can provide a signal verifying that the tool is compatible with that particular robotic system. Secondly, the tool memory may identify the tool-type to the robotic system so that the robotic system can reconfigure its programming. Thirdly, the memory of the tool may indicate tool-specific information, including measured calibration offsets indicating misalignment of the tool drive system, tool life data, or the like. This information may be stored in a read only memory (ROM), or in a nonvolatile memory which can be written to only a single time. The invention further provides improved engagement structures for coupling robotic surgical tools with manipulator structures.

31 Claims, 22 Drawing Sheets



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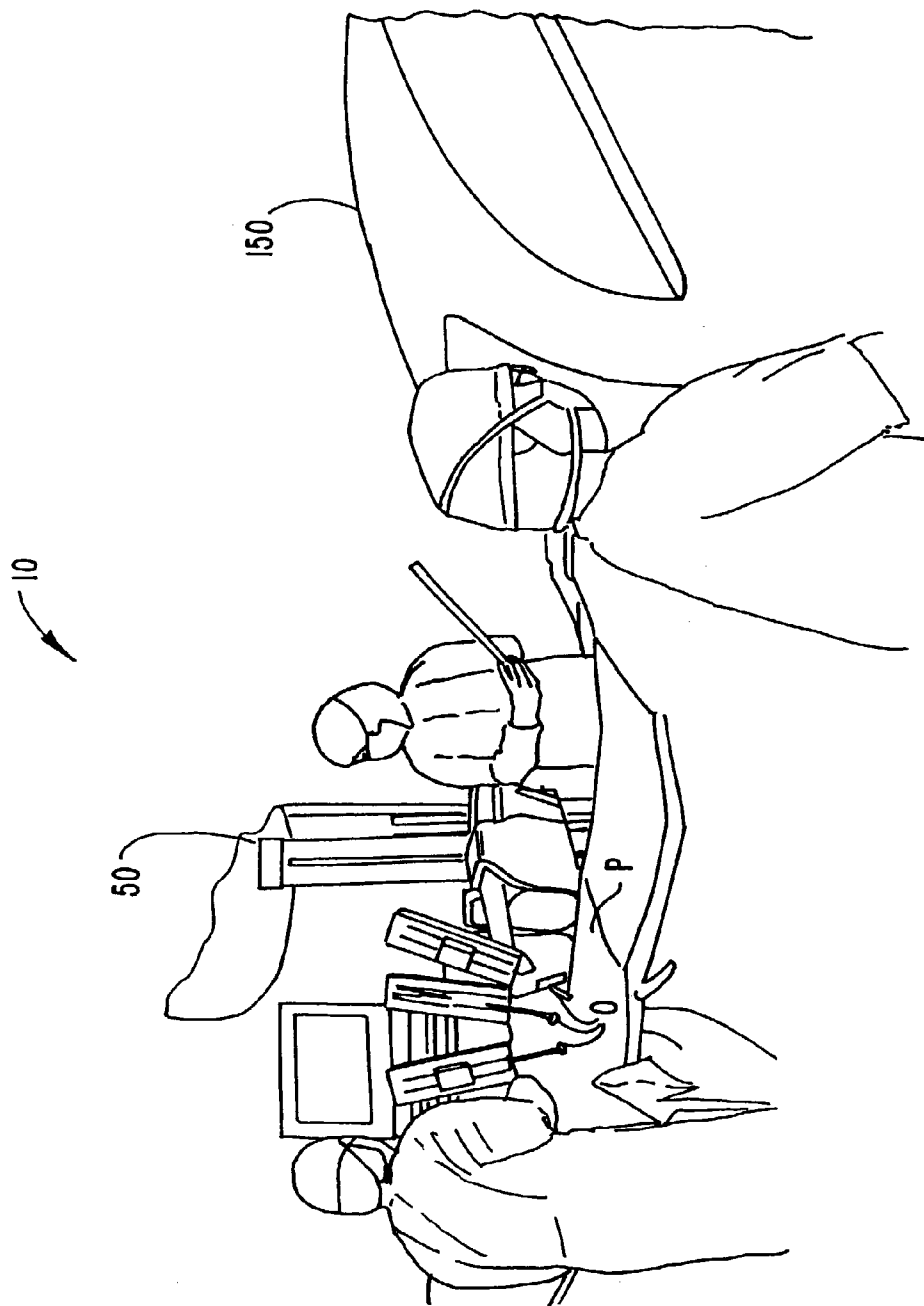


FIG. 1.

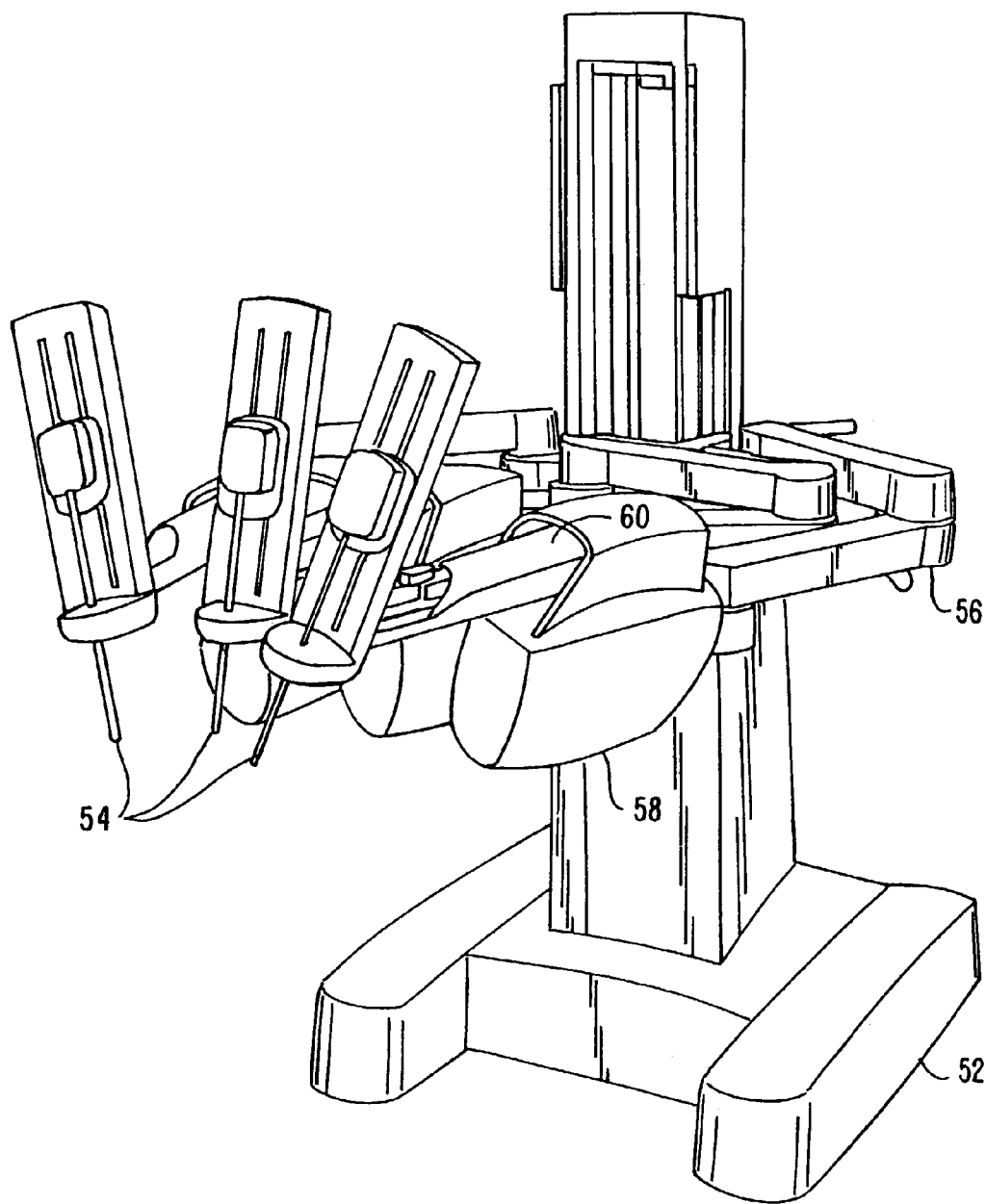


FIG. 2.

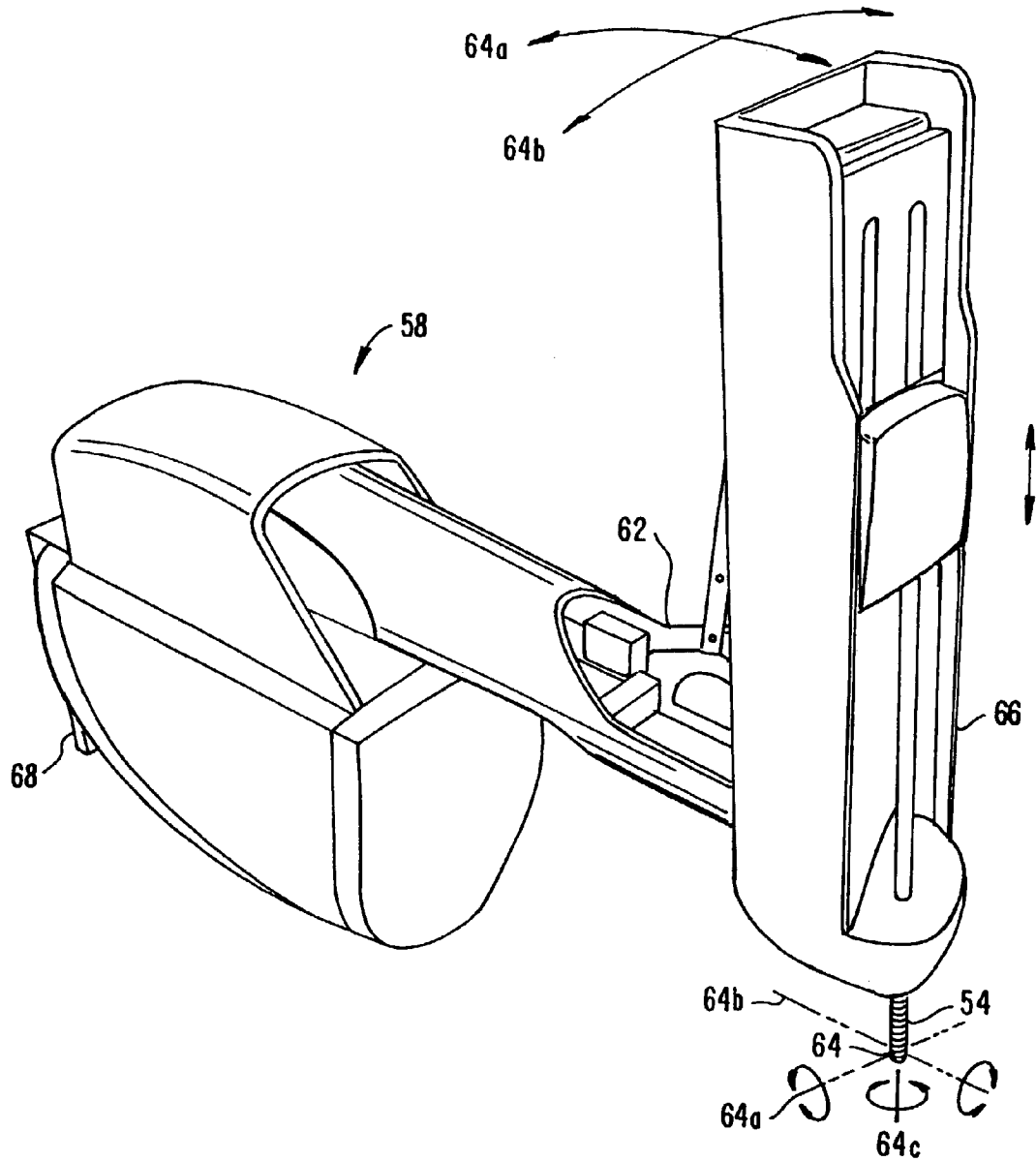


FIG. 2A.

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