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(54) Title: MECHANICAL ARM AND CONTROL METHOD THEREFOR

(54) 发明名称: 一种机械臂及其控制方法

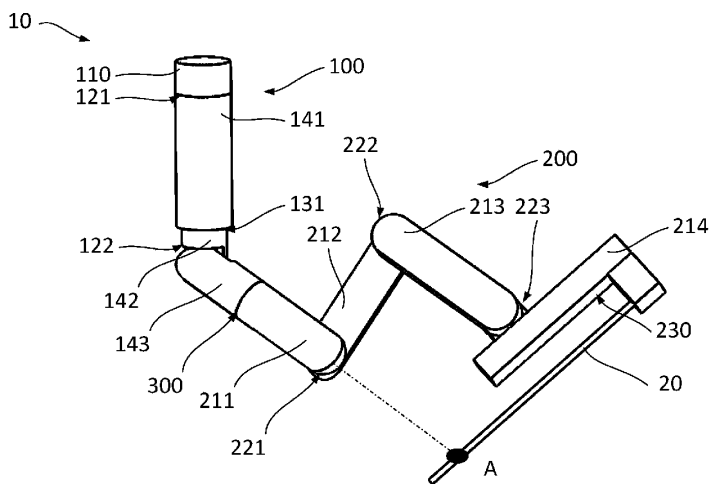


图 1

(57) Abstract: The present invention relates to a mechanical arm and a control method therefor. The mechanical arm comprises a spatial positioning mechanism, a planar motion mechanism, and a self-rotating joint that connects the spatial positioning mechanism and the planar motion mechanism, wherein the space positioning mechanism comprises a base and a joint mechanism, the joint mechanism comprises a plurality of joints which are installed in sequence, the joint at the head end of the joint mechanism is installed on the base, and the joint at the tail end of the joint mechanism is rotatably connected to the self-rotating joint; the tail end of the planar motion mechanism is connected to a surgical instrument, and a vertical line of the plane where the planar motion mechanism is located is perpendicular to the rotation axis of the self-rotating joint; the intersection between the rotation axis of the self-rotating joint section and the axis of the surgical instrument is a driving fixed point, so as to conveniently set the driving fixed point; the rotation of the

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surgical instrument around the driving fixed point does not require the spatial positioning mechanism to move, such that the occurrence of multi-arm collision is reduced; and the infinity solution of the same posture of the surgical instrument can be realized by means of the linkage of the spatial positioning mechanism, the planar motion mechanism and the self-rotating joint, such that the kinematics solution is simple.

(57) 摘要: 本发明涉及一种机械臂及其控制方法, 机械臂包括空间定位机构、平面运动机构及连接空间定位机构和平面运动机构的自转关节, 其中: 空间定位机构包括基座及关节机构, 关节机构包括依次安装的多个关节, 且其首端的关节安装于所述基座, 其末端的关节与所述自转关节转动相连; 平面运动机构的末端与手术器械相连接, 且其所在平面的垂线与自转关节的旋转轴线相垂直; 自转关节的旋转轴线与手术器械的轴线交点为主动不动点, 以能够较为方便地完成主动不动点的设置; 手术器械绕主动不动点的转动无需空间定位机构运动, 减少了多臂碰撞的发生, 通过空间定位机构、平面运动机构及自转关节的联动就可以实现手术器械同一姿态的无穷组解, 使得运动学求解简单。