Manipulator capable of supporting endoscopic medical treatment, medical implement provided with same, and method of evaluating workability of manipulator

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Technology description

The objective of the present invention is to provide a manipulator with which it is possible for an instrument such as a scope or forceps to be manipulated to a desired position and orientation, and with which interference between medical implements in a trocar or in the abdominal cavity can be avoided, thereby alleviating the load on a surgeon, for example. Another objective of the present invention is to provide a medical implement provided with said manipulator, and a method of evaluating the workability of a manipulator. A manipulator 2 is mounted on a scope 1, and is inserted from the distal end side thereof into an abdominal cavity 9, through an opening 8A which communicates with the interior of the abdominal cavity 9. The manipulator 2 is provided with: a penetrating tube 201 which penetrates through the inside of the opening 8A; a first bent portion 21 which is capable of being bent relative to the penetrating tube 201 inside the abdominal cavity 9; an extending and retracting portion 23 which is capable of being extended and retracted on the distal end side of the first bent portion 21; a first bending manipulation wire 31 for manipulating the first bent portion 21; and an extending and retracting manipulation wire 33 for manipulating the extending and retracting portion 23.

Claims

[claim1]

A manipulator is mounted on a medical appliance and inserted into the body cavity from a front end side through a hole communicating with the body cavity.

Through the through portion inside the hole,

A first curved portion that can be curved in the body cavity,

A telescopic portion that is telescopic on that distal end side compare to the first curved portion,

A first bending operation section for operating the first bending section,

A telescopic operation section for operating the telescopic section,

Type of image.

[claim2]

A second bent portion that can be bent on the tip side compared with the telescopic portion,

And a second bending operation section for operating the second bending section.

The robot of claim 1.

[claim3]

The first bending portion is bent at one degree of freedom,

The second bending portion is bent at 2 degrees of freedom.

The robot of claim 2.

[claim4]

And a rotation operation part for rotating the through-part about an axis.

A robot according to claim 1.

[claim5]

The apparatus is a range in which light can be received from a medical target site or the target site can be imaged.

A robot according to claim 1.

[claim6]

The single-hole operation is performed in a state in which the operating device and the processing tool capable of processing the target part are inserted into the same hole. The single-hole operation is

performed in a state in which the operating device and the processing tool capable of processing the target part are inserted into the same hole.

The robot of claim 5.

[claim7]

The apparatus is a processing tool capable of processing a part of a medical subject.

A robot according to claim 1.

[claim8]

They have multiple cylinders,

At that inn side of the cylinder,

A robot according to claim 1.

[claim9]

As that through-tube of the through-portion,

As for that through-tube, the through-tube can be bent in the body cavity, and the through-tube has a telescopic tube structure as the telescopic portion whose length can be telescopic while constitute the first curved portion.

The robot of claim 8.

[claim10]

Includes a front end portion connected to the telescopic portion,

As for that front end portion,

A flexible material is formed to form a second bent portion that is more flexible on the distal end side than the telescopic portion.

A robot according to claim 2.

[claim11]

A second bending operation section for operating a second bending section which is more flexible on the distal end side than the telescopic section,

The first bending operation portion, the telescopic operation portion, and the second bending operation portion,

Contains the wires to stretch.

The robot of claim 3.

[claim12]

A robot according to claim 1,

An apparatus for mounting the manipulator is provided,

A medical device characterized by.

[claim13]

This is a method for evaluating the manipulation of the manipulator simulating the interior of a mold in a body cavity using the manipulator having a second bent portion that is bent at a more tip side than the telescopic portion according to claim 2, wherein the manipulator has a second bent portion that is bent at a more tip side than the telescopic portion.

In a case where the object of treatment in the body cavity is observed by an endoscope to which the manipulator is attached, a number of times the manipulator contacts the medical device when performing a touch operation in which the first bending portion and the second bending portion are inserted into the distal end portion of one or more medical devices in the body cavity together with the manipulator in the body cavity bending state, and the manipulator contacts the medical device while changing a contact position with the subject.

Electrically detecting contact between a portion of the medical device having electrical conductivity and a portion of the robot having electrical conductivity.

Use the following steps to create a list to analyze the volume of the volume in the conceptual design.

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