CLAIMS

1. An arm-type support device comprising:

a first frame and a second frame;

a first arm member that includes a first end and a second end, wherein the first end is supported by the first frame to be pivotal about a first pivot shaft supported by the first frame, and the second end is supported by the second frame to be pivotal about a second pivot shaft supported by the second frame;

an actuator configured to move the second frame by pivoting the first arm member about the first frame; and

a second arm member that includes a first end and a second end, and extends in parallel with an axis of the first arm member, wherein the first end of the second arm member is supported by the first frame to be pivotal about a third pivot shaft supported by the first frame, and the second end of the second arm member is supported by the second frame to be pivotal about a fourth pivot shaft supported by the second frame, wherein

the actuator includes:

a driving unit;

an actuating rod configured to move in an axial direction of the first arm member in accordance with actuation of the driving unit; and

a link member that includes a distal end and a proximal end, wherein the proximal end and the first end of the second arm member are pivotally connected to the first frame, and the distal end is connected to the actuating rod,

the first arm member, the second arm member, the first frame, and the second frame form a parallel link,

the first arm member is hollow and accommodates the actuator and the second arm

member, and

the actuator includes a cylinder tube, which is a tube that accommodates the driving unit and the actuating rod, the cylinder tube making the first arm member hollow.

2. The arm-type support device according to claim 1, wherein

the first arm member includes two arm guides extending in the axial direction of the first arm member and being opposed to each other with a space,

the second arm member is arranged between the arm guides, and

inner surfaces of the arm guides define an opening and the opening is closed by the second arm member.

3. An arm-type support device comprising:

a first frame and a second frame;

a first arm member that includes a first end and a second end, wherein the first end is supported by the first frame to be pivotal about a first pivot shaft supported by the first frame, and the second end is supported by the second frame to be pivotal about a second pivot shaft supported by the second frame;

an actuator configured to move the second frame by pivoting the first arm member about the first frame; and

a second arm member that includes a first end and a second end, and extends in parallel with an axis of the first arm member, wherein the first end of the second arm member is supported by the first frame to be pivotal about a third pivot shaft supported by the first frame, and the second end of the second arm member is supported by the second frame to be pivotal about a fourth pivot shaft supported by the second frame, wherein

the actuator includes:

a driving unit;

an actuating rod configured to move in an axial direction of the first arm member in accordance with actuation of the driving unit; and

a link member that includes a distal end and a proximal end, wherein the proximal end and the first end of the second arm member are pivotally connected to the first frame, and the distal end is connected to the actuating rod,

the first arm member, the second arm member, the first frame, and the second frame form a parallel link,

the first arm member is hollow and accommodates the actuator and the second arm member,

the first end of the first arm member has a shape of a plate, the first frame includes two first shaft supports that are bifurcated, the first pivot shaft is inserted into the first end of the first arm member and the first shaft supports that sandwich the first end, and the first end is pivotal about the first pivot shaft supported by the first shaft supports, and

the second end of the first arm member is bifurcated, the second frame includes a second shaft support having a shape of a plate, the second pivot shaft is inserted into the second shaft support of the second frame and the second end that sandwiches the second shaft support, and the second end is pivotal about the second pivot shaft supported by the second shaft support.

4. An arm-type support device comprising:

a first frame and a second frame;

a first arm member that includes a first end and a second end, wherein the first end is supported by the first frame to be pivotal about a first pivot shaft supported by the first frame, and the second end is supported by the second frame to be pivotal about a second

pivot shaft supported by the second frame;

an actuator configured to move the second frame by pivoting the first arm member about the first frame; and

a second arm member that includes a first end and a second end, and extends in parallel with an axis of the first arm member, wherein the first end of the second arm member is supported by the first frame to be pivotal about a third pivot shaft supported by the first frame, and the second end of the second arm member is supported by the second frame to be pivotal about a fourth pivot shaft supported by the second frame, wherein

the actuator includes:

a driving unit;

an actuating rod configured to move in an axial direction of the first arm member in accordance with actuation of the driving unit; and

a link member that includes a distal end and a proximal end, wherein the proximal end and the first end of the second arm member are pivotally connected to the first frame, and the distal end is connected to the actuating rod,

the first arm member, the second arm member, the first frame, and the second frame form a parallel link,

the first arm member is hollow and accommodates the actuator and the second arm member,

the distal end of the link member is pivotally supported by the actuating rod,

a guide roller is rotationally supported by the actuating rod, and

a guide member configured to move the guide roller in the axial direction of the first arm member is arranged in the first arm member.

5. An arm-type support device comprising:

a first frame and a second frame;

a first arm member that includes a first end and a second end, wherein the first end is supported by the first frame to be pivotal about a first pivot shaft supported by the first frame, and the second end is supported by the second frame to be pivotal about a second pivot shaft supported by the second frame;

an actuator configured to move the second frame by pivoting the first arm member about the first frame; and

a second arm member that includes a first end and a second end, and extends in parallel with an axis of the first arm member, wherein the first end of the second arm member is supported by the first frame to be pivotal about a third pivot shaft supported by the first frame, and the second end of the second arm member is supported by the second frame to be pivotal about a fourth pivot shaft supported by the second frame, wherein

the actuator includes:

a driving unit;

an actuating rod configured to move in an axial direction of the first arm member in accordance with actuation of the driving unit; and

a link member that includes a distal end and a proximal end, wherein the proximal end and the first end of the second arm member are pivotally connected to the first frame, and the distal end is connected to the actuating rod,

the first arm member, the second arm member, the first frame, and the second frame form a parallel link,

the first arm member is hollow and accommodates the actuator and the second arm member, and

a rod cover is arranged in the first arm member, the actuating rod extends through the rod cover, and the actuating rod is supported by the rod cover so that the actuating rod

moves in the axial direction of the first arm member.

6. The arm-type support device according to claim 5, wherein

the first arm member includes a cylindrical tube,

a central axis of the tube extends in the axial direction of the first arm member,

the rod cover and a head cover define a piston chamber inside the tube,

the driving unit includes the piston chamber and a piston accommodated in the piston chamber,

the piston is connected to the actuating rod,

when the piston is moved by the link member and the actuating rod in the piston chamber as a position of the parallel link is changed, pressure of fluid is adjusted in accordance with a change in capacity of the piston chamber, and

the head cover includes an on-off valve that closes the piston chamber when supply of the fluid to the piston chamber is stopped.