Tohoku Univ. Technology

Variable stiffness connecting body

Able to change its own shape and maintain high rigidity with small force

Overview

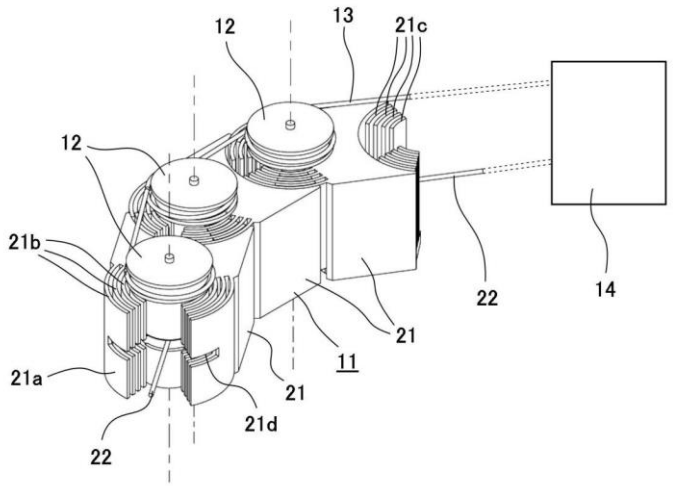
The mechanism that switches between a flexible state, which can be easily deformed when applying external force, and a high stiff state, which can transmit force to the outside when contact is made, has been studied in the past. A gripper that grasps an object using this mechanism has also been proposed. There are a wide variety of grippers, some consisting of a plurality of connecting parts arranged in a row connected to each other with a rotation flexibility, and others consisting of beads arranged in a row through a wire. However, increasing its length results to the loss of friction force, so it is not possible to achieve a high stiff state and to change the shape by itself.

This invention overcomes these issues, and provides a variable stiffness connecting body that can change its own shape and maintain a high stiff state with a relatively small force. This invention has pulleys on multiple connecting parts that are connected in a row. Each pulley has a string for rotation and is configured to allow switching between fixed and rotational states of the connecting parts. This invention can reduce the force required to keep the connecting body in a fixed and high stiff state, thus allowing to keep grasping the object with a relatively small force.

Product Application

- ☐ Gripper (robot hand)
- ☐ Machine tool
- ☐ Tube inspection device

Configuration of the variable stiffness connecting body



11.Connecting body 12.Pulley 13.Rotation string
14.Operation mean 21.Connecting part
21a.Protrusion 21b/c.Cylinder 21d.Through hole
22.Switching string

IP Data

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