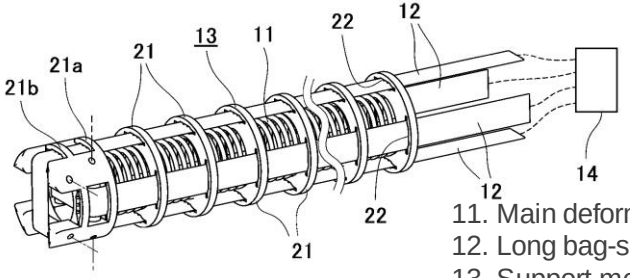
Tohoku Univ. Technology

# Variable stiffness deformable body and mechanism

**Possible to bend in any direction in the flexible state and to keep stiffness in the rigid state**




11. Main deformable body
12. Long bag-shaped body
13. Support mean
14. Fluid supply / discharge mean
21. Support piece
22. Support hole

## Overview

Today, several mechanisms that can switch between a deformable flexible state and a high rigidity state are known. For example, there is a mechanism to increase rigidity by applying negative pressure to the wire, or a mechanism in which adjacent connecting parts increase the rigidity of the joint area. However, there were various issues such as the rigidity limitation due to the limit of the negative pressure, the difficulty of achieving high rigidity at the extremity due to the length of the wire, or the inability to bend the wire in any direction.

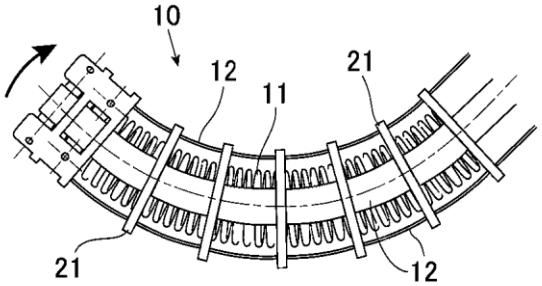
This invention solves above issues, and is able to provide a variable stiffness deformable body and mechanism which can bend in any direction at flexible state, increase rigidity at high rigidity state, and make the entire body highly rigid even if it is lengthened. The invention is characterized by a long flexible deformable body, a long bag shaped body, a support mean and a fluid supply / discharge mean. The invention is able to fix the body shape at high rigidity even if the body is bent, twisted in any direction or straightened, by suppling the fluid into the bag interior.

## Product Application

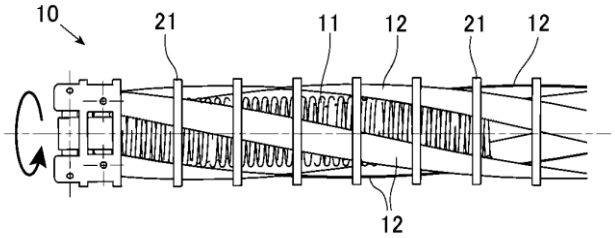
- Endoscope, assistive suit, robot arm
- Training equipment, rehabilitation equipment, VR equipment

## Possible to fix at a predetermined shape and keep high rigidity

Bending




Twisting




## IP Data

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