DESCRIPTION

Electronic functional member and strain sensor

TECHNICAL FIELD

【0001】

This disclosure relates to an electro-functional member, and a strain sensor configured using the electro-functional member.

BACKGROUND ART

【0002】

Recently, flexible electronics has attracted a lot of attention because softness of the materials provides various applications. Particularly, in accordance with the worldwide aging of the society, the health care field has been drawing increasing attention. For example, the flexible electronics has been attracting attention as means for directly obtaining biological information from cells and tissues by attaching to the surface of the human body and inside the body.

【0003】

Generally, while the flexible electronics is manufactured by forming an electronics device on a flexible substrate, its flexibility cannot be said to be sufficient. Therefore, the surface followability cannot be said to be sufficient, and thus it is impossible to obtain information with high accuracy and to sufficiently reduce the uncomfortable feeling and the like during the attachment.

【0004】

To solve such a problem, there has been proposed an electro-functional member in which a fiber network of a nanofiber made of water-soluble polyvinyl alcohol (PVA) is formed by an electrospinning method, and gold is vapor-deposited thereon to form an electrode layer, thereby providing sufficiently high surface followability, stretchability in a lateral direction, permeabilities of gas and water, and transparency (for example, Non-patent Document 1).

【0005】

Non-Patent Document 1: Akihito Miyamoto et． al．、Nature Nanotechnology 12,907(2017)

SUMMARY

【0006】

However, when the electro-functional member of the above-described prior art is directly adhered to the skin to be used, there is room for improving the stretch resistance.

【0007】

Therefore, the inventors involved in this application have been dedicated to the examination and found that, by forming a fiber network composed of 1 kinds of resins into a configuration in which the fiber network is coated with another resin, stretch resistance is improved.

【0008】

The present disclosure is made in consideration of the above-mentioned points, and an object of this disclosure is to provide an electro-functional member having improved stretch resistance, and a strain sensor.

【0009】

To achieve the above object, the electro-functional member of the present disclosure is constituted by including a fiber formed in a network shape constituting a fiber network, a coating layer having a Young's modulus lower than that of the fiber covering the fiber, and a conductive layer formed on the surface of the coating layer.

【0010】

Further, the strain sensor of the present disclosure includes a detection section, a measuring section, and an output section, the detection section is attached to the measurement object, a portion where the electrical resistance value changes in response to the shape or change of the measurement object, the measuring section measures the electrical resistance value of the detection section, sends the electrical resistance value to the output section, the output section, based on the electrical resistance value received from the measuring section, and outputs a predetermined signal.

【0010a】

In a first aspect, the present disclosure provides an electro-functional member comprising: fibers that constitute the fiber network and are formed in a network form, coating layers that coat said fibers and have a Young's modulus lower than said fibers, and conductive layers formed on the surface of the coating layers.

【0010b】

In a second aspect, the present disclosure provides an electro-functional

member fibers that constitute the fiber network, are formed in a network form, and are formed of one of the material selected from the group consisting of Polyurethane, polyvinyl alcohol (PVA) derivative and polyvinylidene fluoride (PVDF) constituting the fiber network, coating layers that coat said fibers, have a Young's modulus lower than said fibers, and polydimethylsiloxane (PDMS) or and ethylene vinyl acetate (EVA) resin as a material, and conductive layers formed on the surface of the coating layers

【0010c】

In a third aspect, the present disclosure provides a strain sensor comprising: a detection section, a measuring section and a output section, wherein the detecting section comprises the electro-functional member according to the first aspect or the second aspect, is attached to the measurement object, and is a section where the electrical resistance value changes according to the shape or change thereof of the measurement object, the measuring section measures the electrical resistance value of the detection section, and sends the electrical resistance value to the output section, and the output section outputs a predetermined signal based on the electrical resistance value received from the measuring section.

【0011】

According to the electro-functional member and the strain sensor of this disclosure, the stretch resistance is improved by coating a fiber network composed of one type of resin with another resin.

BRIEF DESCRIPTION OF THE DRAWINGS