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(54) **PRESSURE SENSOR AND WEARABLE SENSOR**

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(57) **ABSTRACT**

A technique that can emit a sensor signal that accurately reflects only the pressure to be truly detected in a glove-type wearable sensor in which a film-like pressure sensor is incorporated into a fingertip of a thin work glove is disclosed. In a film-like pressure sensor incorporated into a fingertip of a glove-type wearable sensor, three coordinate axis directions in a three-dimensional orthogonal coordinate system are assumed to be a vertical direction, a longitudinal direction of the pressure sensor, and a width direction of the pressure sensor, at least one or more flexible printed circuits and one sheet-like pressure sensitive element are laminated in the vertical direction, and only the pressure applied to the fingertip of a wearer after wearing the wearable sensor is detected.

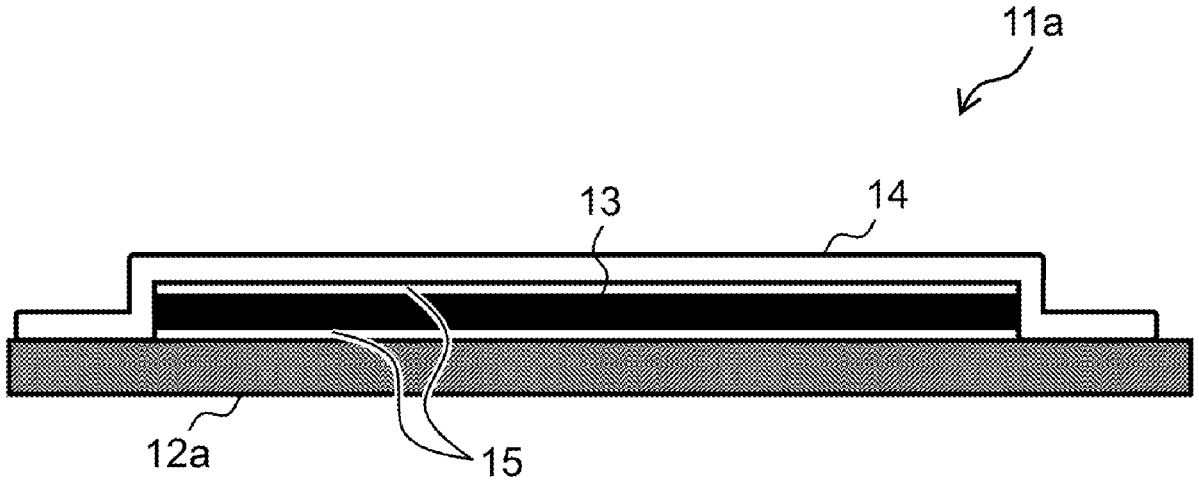


FIG. 1

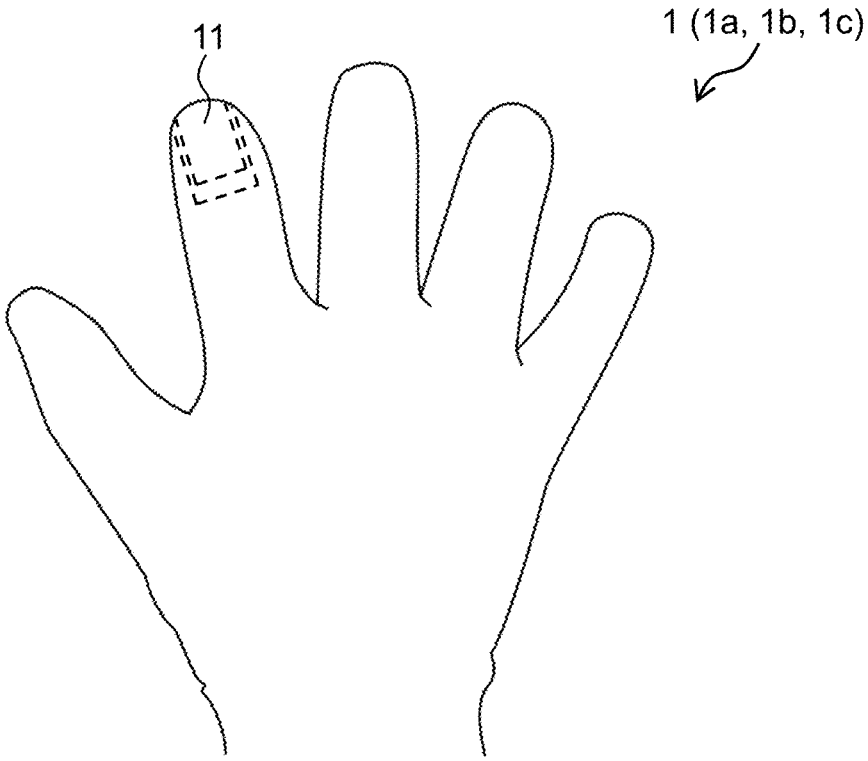


FIG. 2

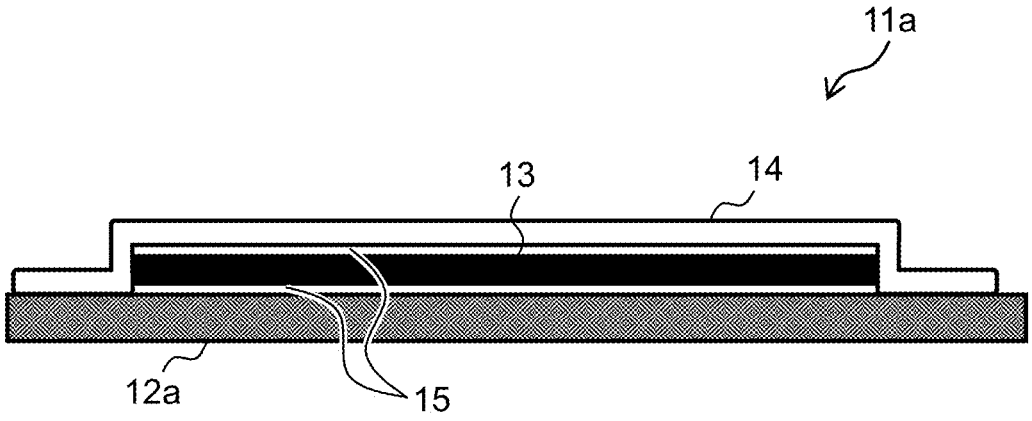
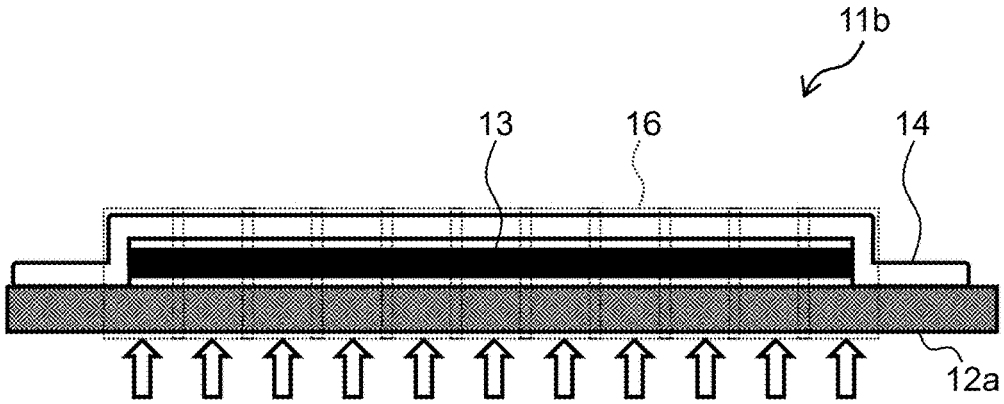


FIG. 3A



(PROTECT WITH ADHESIVE FILM WHOSE SIDE SURFACES ARE DIVIDED INTO PLURALITY OF PIECES)

FIG. 3B

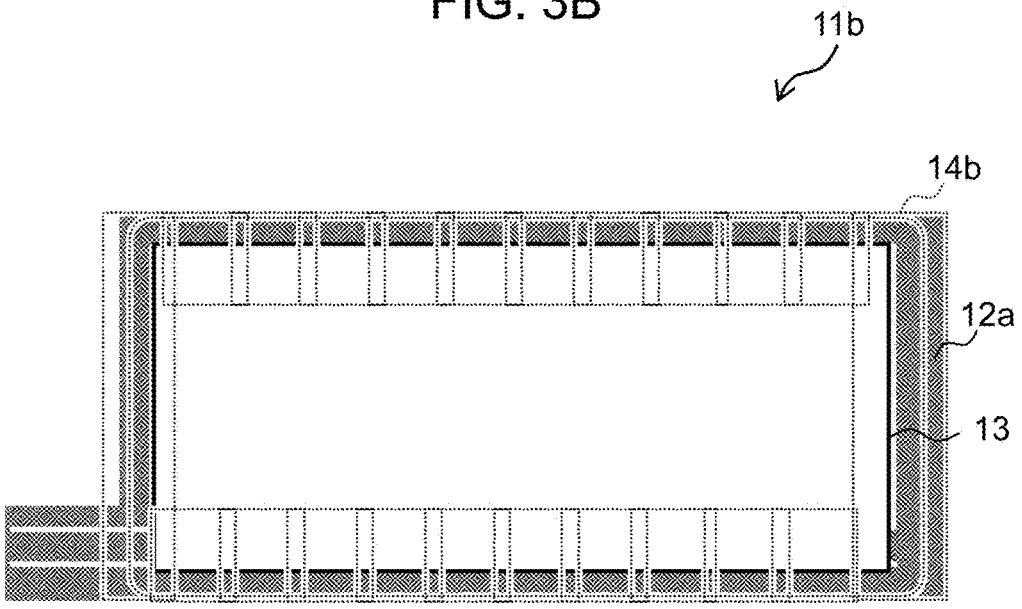


FIG. 4A

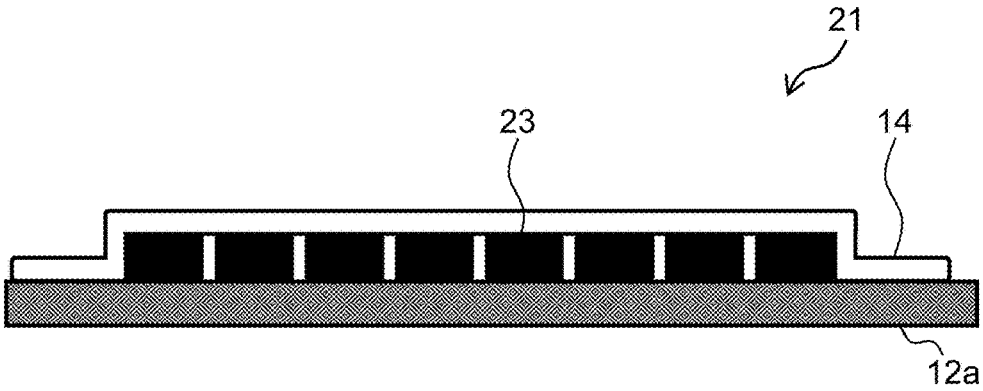


FIG. 4B

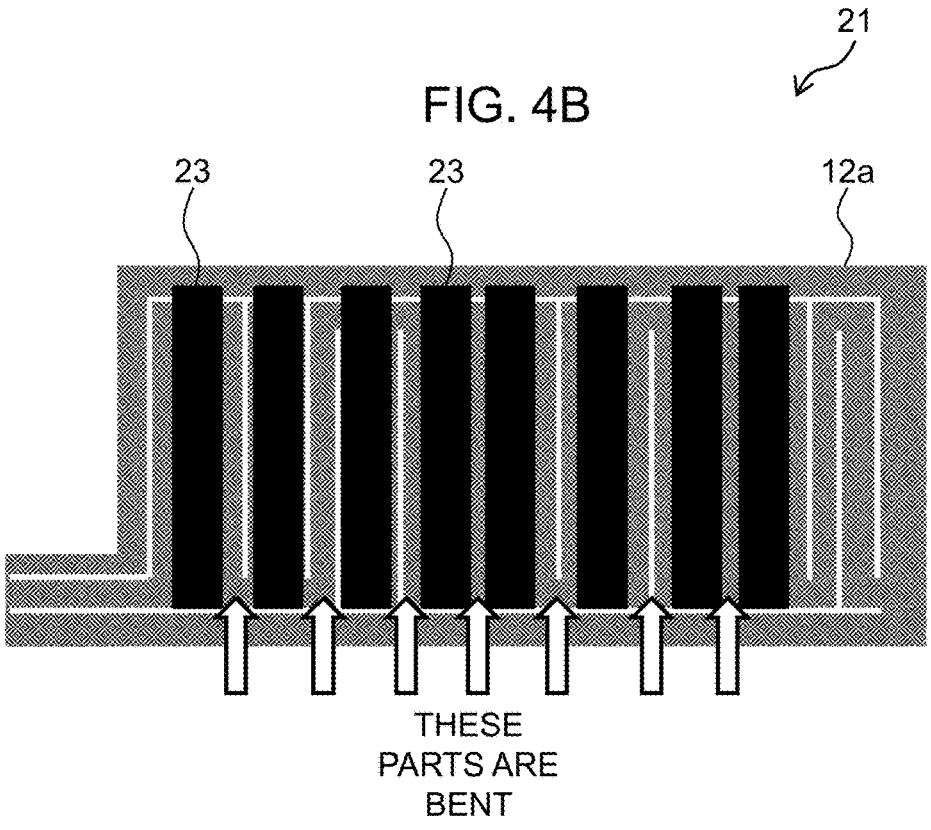


FIG. 5

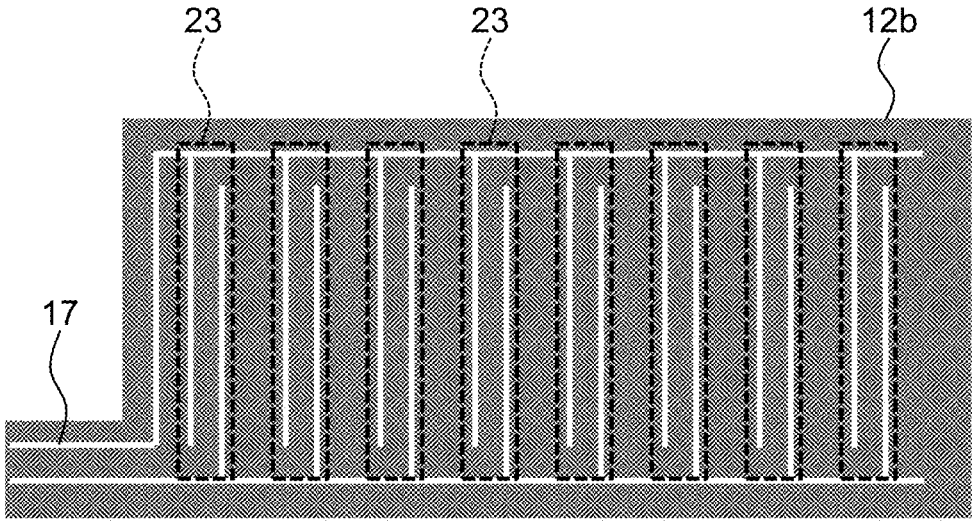


FIG. 6

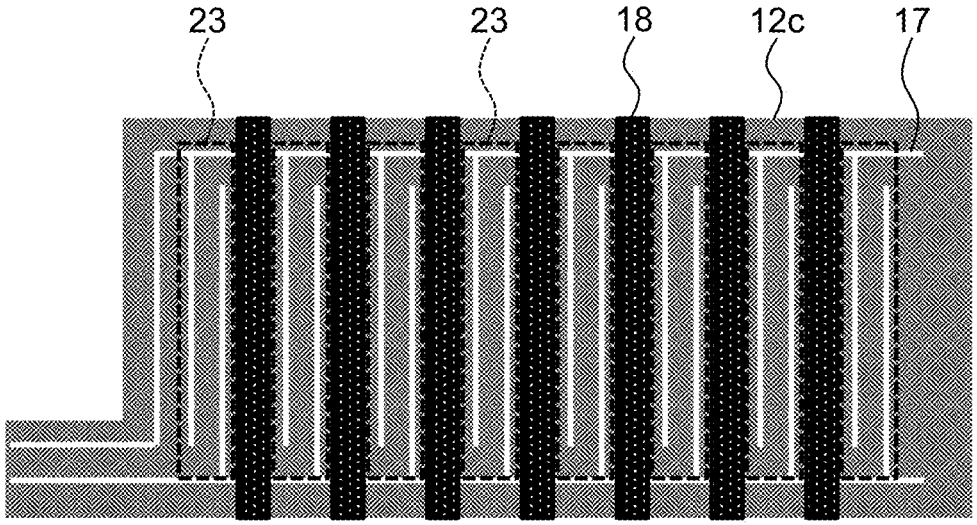


FIG. 7

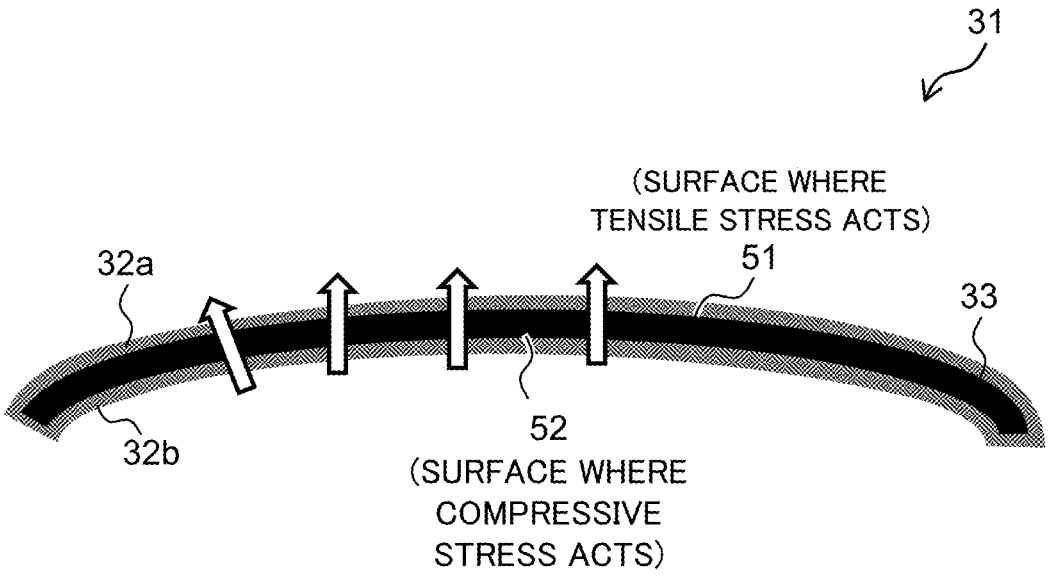

31
(SURFACE WHERE
TENSILE STRESS ACTS)
51
32a
33
52
32b
(SURFACE WHERE
COMPRESSIVE
STRESS ACTS)

FIG. 8A

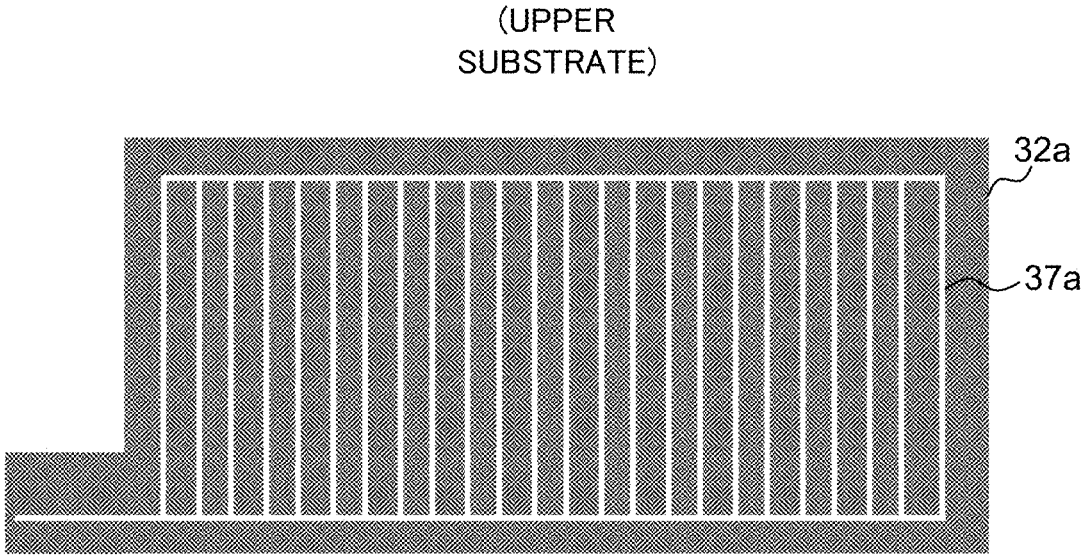


FIG. 8B

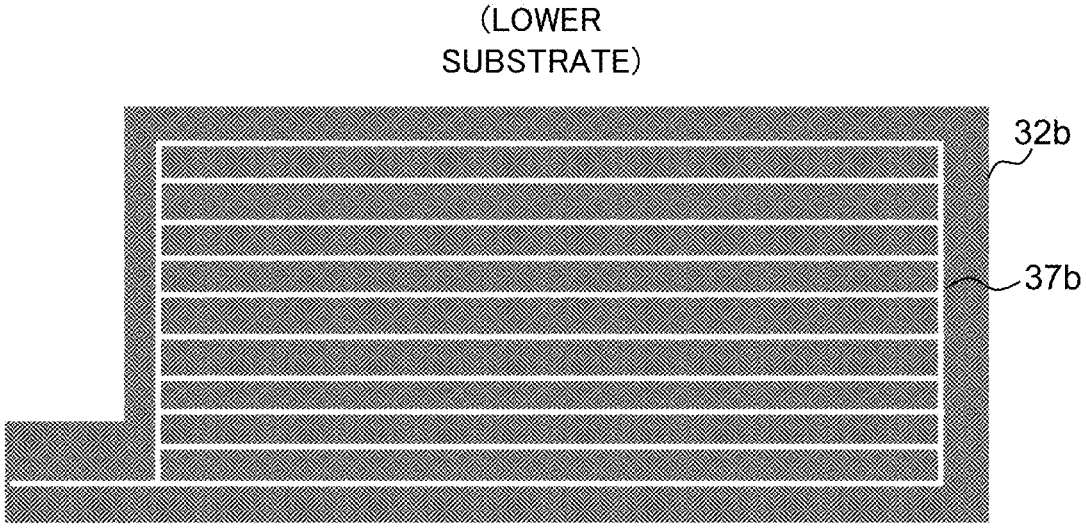


FIG. 9A

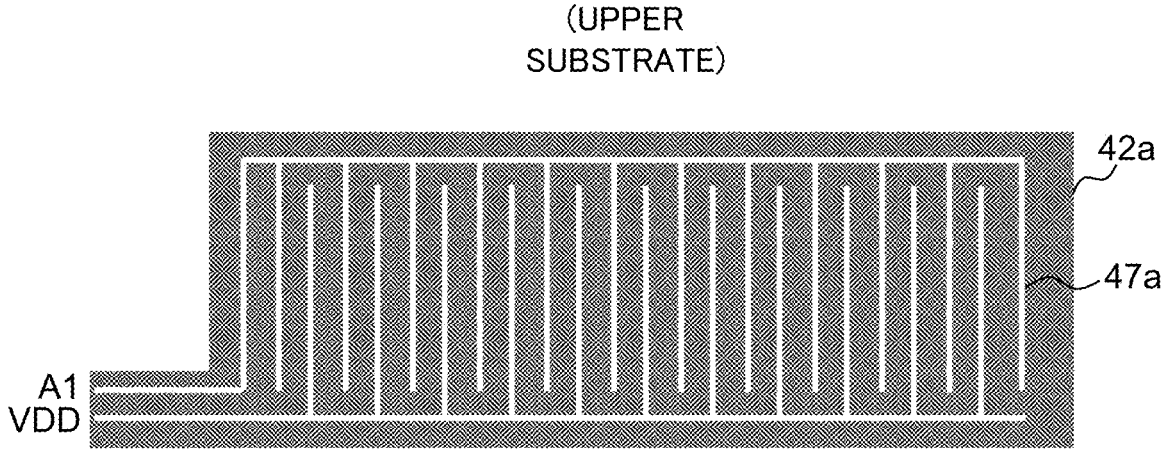


FIG. 9B

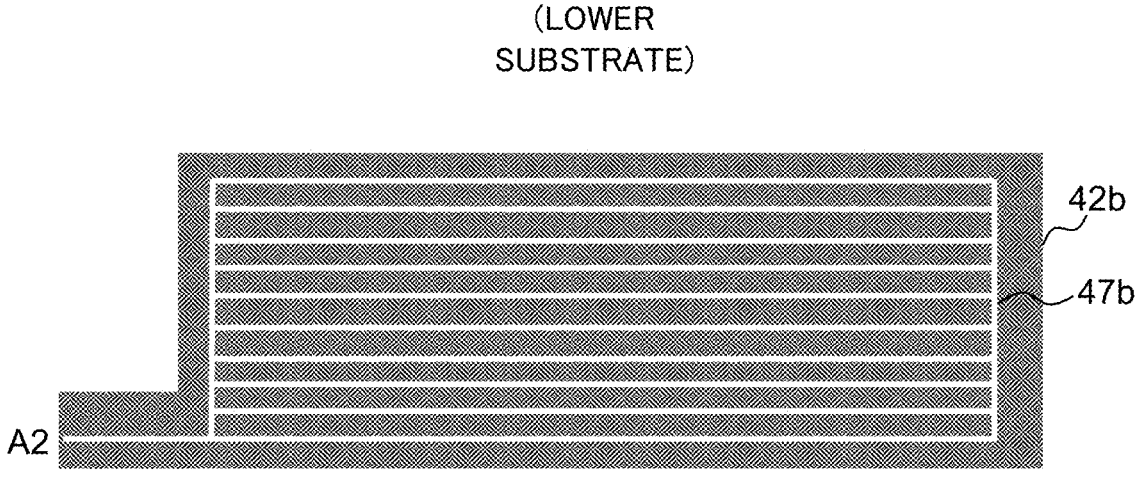
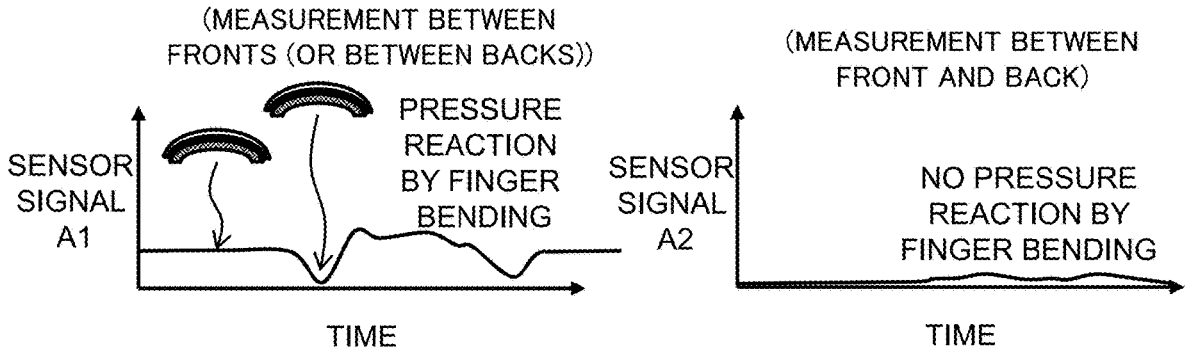


FIG. 10


(MEASUREMENT BETWEEN FRONTS (OR BETWEEN BACKS))
PRESSURE REACTION BY FINGER BENDING
SENSOR SIGNAL A1
TIME
(MEASUREMENT BETWEEN FRONT AND BACK)
NO PRESSURE REACTION BY FINGER BENDING
SENSOR SIGNAL A2
TIME

PRESSURE SENSOR AND WEARABLE SENSOR

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority from Japanese application JP2022-161771, filed on Oct. 6, 2022, the content of which is hereby incorporated by reference into this application.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a pressure sensor and a glove-type wearable sensor in which the pressure sensor is incorporated into a fingertip.

2. Description of the Related Art

[0003] In a manufacturing site of today where the automation of production lines has been advanced, there are still quite a few work processes that require human labor. In the work processes that require human labor, there are problems such as the retirement of skilled workers and the resulting shortage of successors, in addition to chronic labor shortages caused by a decline in the working-age population. As part of efforts to solve such problems, in recent years, the action of skilled workers during work has been digitized to be used as teaching materials in vocational training for the development of successors or used as a standard to check whether or not the work is accurate.

[0004] One of the main methods for digitizing the action of people who are working is a method in which various wearable sensors are mounted on a worker to directly sense the action of the worker.

[0005] As an example, when digitizing various manual works including an action of grasping and releasing an object, a method of using a glove-type wearable sensor in which a film-like or sheet-like pressure sensor is incorporated into a fingertip of a work glove has been known as an effective method (for example, JP-2021-001410-A).

SUMMARY OF THE INVENTION

[0006] In an actual manufacturing site, it is very important that the glove-type wearable sensor worn by a worker have a good wearing feeling fitting well to the tip of a hand and not hindering the action, so as not to interfere with the work. Therefore, it is preferable for the glove-type wearable sensor provided for the above-described applications to have a film-like or sheet-like (hereinafter, simply and correctively referred to as "film-like") pressure sensor incorporated into a fingertip of a thin work glove.

[0007] However, in a case where such wearable sensors are created using thin work gloves in order to obtain a good wearing feeling, there is a problem that, at the time of wearing of the wearable sensor or when the finger is bent after wearing, various stresses act on a pressure sensitive element inside a pressure sensor to thereby cause the pressure sensor to react and unnecessary sensor values are acquired.

[0008] In view of the above problem, an object of the present invention is to provide a technique that can emit a sensor signal that accurately reflects only the pressure to be truly detected in a glove-type wearable sensor in which a film-like pressure sensor is incorporated into a fingertip of a thin work glove.

[0009] A pressure sensor according to the present invention is a film-like pressure sensor incorporated into a fingertip of a glove-type wearable sensor, three coordinate axis directions in a three-dimensional orthogonal coordinate system are assumed to be a vertical direction, a longitudinal direction of the pressure sensor, and a width direction of the pressure sensor, at least one or more flexible printed circuits and one sheet-like pressure sensitive element are laminated in the vertical direction, and only a pressure applied to a fingertip of a wearer after wearing the wearable sensor is detected.

[0010] In addition, a glove-type wearable sensor in which the above pressure sensor is incorporated into a fingertip is also within the scope of the present invention.

[0011] The other problems and solving methods disclosed in this application will be clarified by the description in the column of the description of the preferred embodiments and the drawings.

[0012] According to the present invention, in a glove-type wearable sensor in which a film-like pressure sensor is incorporated into a fingertip of a thin work glove, only the pressure applied to the fingertip of a wearer after wearing the wearable sensor can accurately be detected. As a result, it is possible to emit a sensor signal that accurately reflects only the pressure to be truly detected.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. **1** shows the appearance of a wearable sensor;

[0014] FIG. **2** shows a configuration of a pressure sensor according to a first embodiment;

[0015] FIG. **3**A shows a modified example of the configuration of the pressure sensor according to the first embodiment;

[0016] FIG. **3**B shows a modified example of the configuration of the pressure sensor according to the first embodiment;

[0017] FIG. **4**A shows a configuration of a pressure sensor according to a second embodiment;

[0018] FIG. **4**B shows the configuration of the pressure sensor according to the second embodiment;

[0019] FIG. **5** shows a modified example of a configuration of a flexible printed circuit of the pressure sensor according to the second embodiment;

[0020] FIG. **6** shows a modified example of a configuration of a flexible printed circuit of the pressure sensor according to the second embodiment;

[0021] FIG. **7** shows a configuration of a pressure sensor according to a third embodiment;

[0022] FIG. **8**A shows a configuration of an upper substrate of the pressure sensor according to the third embodiment;

[0023] FIG. **8**B shows a configuration of a lower substrate of the pressure sensor according to the third embodiment;

[0024] FIG. **9**A shows a modified example of the configuration of the upper substrate of the pressure sensor according to the third embodiment;

[0025] FIG. **9**B shows a modified example of the configuration of the lower substrate of the pressure sensor according to the third embodiment; and

[0026] FIG. **10** shows the relation between an electrode terminal to be used and a sensor signal to be acquired in the pressure sensor using the flexible printed circuit shown in FIGS. **9**A and **9**B.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] Hereinafter, some embodiments will be described.

[0028] It should be noted that the following description assumes that three coordinate axis directions in a three-dimensional orthogonal coordinate system are a vertical direction, a longitudinal direction of a pressure sensor, and a width direction of the pressure sensor.

First Embodiment

[0029] First, the outline of a wearable sensor will be described.

[0030] FIG. **1** shows the appearance of a wearable sensor **1**.

[0031] As shown in FIG. **1**, the wearable sensor **1** is a glove-type wearable sensor that is also referred to as a sensor glove or a sensor-incorporated glove and in which a film-like pressure sensor **11** is incorporated into a fingertip of a thin work glove. The pressure sensor **11** is incorporated into the center region on the cushion side of the fingertip of the wearable sensor **1**, and when the wearable sensor **1** is mounted on a hand of a wearer, the shape thereof is deformed along the shape of the fingertip of the wearer. Accordingly, the wearable sensor **1** fits well to the tip of the hand of the wearer. As a result, the wearer of the wearable sensor **1** can obtain a good wearing feeling that does not hinder work even in an actual manufacturing site.

[0032] In addition, since the pressure sensor **11** incorporated into the fingertip is provided with features to be described later, the wearable sensor **1** can relieve various stresses acting on a pressure sensitive element of the pressure sensor **11** incorporated into the fingertip, at the time of wearing of the wearable sensor **1** or when the finger is bent after wearing. As a result, the wearable sensor **1** can properly detect only the pressure applied to the fingertip of the wearer after wearing (described later in detail).

[0033] That is, the wearable sensor **1** provided with the above features fits well to the tip of the hand of the wearer and can accurately detect only the application of pressure to the fingertip of the wearer after wearing.

[0034] It should be noted that, although the wearable sensor **1** exemplified in FIG. **1** is illustrated on the assumption that the pressure sensor **11** is incorporated into the fingertip of the index finger, to facilitate understanding, it is obvious that the pressure sensor **11** may be incorporated into the fingertip of another finger or into the fingertips of a plurality of fingers. In addition, it is sufficient if the specific position and orientation of the pressure sensor **11** incorporated into the fingertip of the wearable sensor **1** are appropriately determined according to the details of the action of the wearer during the work and the physical features of the wearer.

[0035] Next, a pressure sensor incorporated into the wearable sensor **1** will be described.

[0036] FIG. **2** shows a configuration of a pressure sensor **11***a* according to the first embodiment.

[0037] The pressure sensor **11***a* shown in FIG. **2** includes one flexible printed circuit **12***a*, one pressure sensitive element **13**, and one protective film **14**. In the flexible printed circuit **12***a*, a sheet-like electrode made of a conductive metal foil such as a copper foil is provided inside a polymer thick film (PTF). The electrode provided in the flexible printed circuit **12***a* is formed approximately in a comb-like shape when viewed from the vertical direction. On the upper surface side of the flexible printed circuit **12***a*, the sheet-like pressure sensitive element **13** is provided approximately parallel to the flexible printed circuit **12***a*. The pressure sensitive element **13** is electrically connected to the electrode of the flexible printed circuit **12***a*. Then, on the upper surface side of the pressure sensitive element **13**, the protective film **14** made of insulating resin is arranged, and an upper surface of the flexible printed circuit **12***a* and a lower surface of the protective film **14** are bonded and fixed to each other at the periphery of the pressure sensor **11***a*.

[0038] That is, the pressure sensitive element **13** is enclosed in an inner space of the pressure sensor **11***a*, the inner space being formed by the upper surface of the flexible printed circuit **12***a* and the lower surface of the protective film **14**, in a position where a lower surface of the pressure sensitive element **13** faces the upper surface of the flexible printed circuit **12***a* and an upper surface of the pressure sensitive element **13** faces the lower surface of the protective film **14**. Then, double-sided non-adhesive films **15** are interposed between the lower surface of the pressure sensitive element **13** and the upper surface of the flexible printed circuit **12***a* and between the upper surface of the pressure sensitive element **13** and the lower surface of the protective film **14**.

[0039] When various pressures are applied to the fingertip of the wearable sensor **1** (**1***a*) into which the pressure sensor **11***a* is incorporated, the pressure sensor **11***a* is deformed, and the pressure sensitive element **13** inside the pressure sensor **11***a* is accordingly deformed as well. Inside the pressure sensitive element **13**, fine particles having conductivity uniformly exist at approximately equal intervals in a state where the wearable sensor **1** (**1***a*) is not worn, that is, in an initial state. However, when the pressure sensitive element **13** is deformed, the distance between the fine particles existing inside is partially expanded and contracted. Therefore, an electrical resistance value in the pressure sensitive element **13** changes when being energized. Accordingly, the wearable sensor **1** (**1***a*) can detect various pressures applied to the fingertip.

[0040] It should be noted that, unlike the pressure sensor **11***a*, the pressure sensor in the prior art does not have the double-sided non-adhesive films **15** interposed between a lower surface of the pressure sensitive element and an upper surface of the flexible printed circuit and between an upper surface of the pressure sensitive element and a lower surface of the protective film, but the lower surface of the pressure sensitive element and the upper surface of the flexible printed circuit are bonded and fixed to each other, and the upper surface of the pressure sensitive element and the lower surface of the protective film are bonded and fixed to each other. Therefore, when the pressure sensor is deformed, not only (1) the stress acting on the pressure sensitive element itself when deformed, but also (2) the stress applied from the protective film and (3) the stress applied from the flexible printed circuit act on the pressure sensitive element due to the difference in physical and mechanical properties of the flexible printed circuit, the pressure sensitive element, and

the protective film. Therefore, the pressure detected by the pressure sensor in the prior art is any one of (1) to (3) of the above or a combination of (1) to (3) of the above. Due to the presence of such problems, the pressure sensor in the prior art cannot emit a sensor signal that accurately reflects only the pressure to be truly detected.

[0041] However, in the pressure sensor **11***a*, the double-sided non-adhesive films **15** are interposed between the lower surface of the pressure sensitive element **13** and the upper surface of the flexible printed circuit **12***a* and between the upper surface of the pressure sensitive element **13** and the lower surface of the protective film **14** as described above. Therefore, the pressure sensitive element **13** is arranged inside the pressure sensor **11***a* in a state where the lower surface of the pressure sensitive element **13** is not bonded and fixed to the upper surface of the flexible printed circuit **12***a* and the upper surface of the pressure sensitive element **13** is not bonded and fixed to the lower surface of the protective film **14**. Accordingly, unnecessary stress acting on the pressure sensitive element in relation to the flexible printed circuit and the protective film in the prior art is not applied to the pressure sensitive element **13**, and thus the pressure sensor **11***a* can emit a sensor signal that accurately reflects only the pressure to be truly detected.

[0042] It should be noted that the pressure sensor may be protected by an adhesive film whose side surfaces in the longitudinal direction are divided into a plurality of pieces as shown in FIGS. **3**A and **3**B. In this case, side surfaces of a pressure sensor **11***b* may be separately protected by a plurality of divided adhesive films **16** as shown in FIG. **3**A, or side surfaces of a protective film **14***b* that protects the side surfaces of the pressure sensor **11***b* may be divided into a plurality of pieces as shown in FIG. **3**B. In such a case, the stress on the side surfaces of the pressure sensor **11***b* can be relieved because side surfaces of the adhesive film **16** or the protective film **14***b* that protects the side surfaces of the pressure sensor **11***b* are divided into a plurality of pieces.

Second Embodiment

[0043] A wearable sensor **1***b* of the second embodiment is equivalent to the wearable sensor **1** (**1***a*) shown in FIG. **1** in the description of the first embodiment, except that the structure of the pressure sensor incorporated into the fingertip is different.

[0044] FIGS. **4**A and **4**B show a configuration of a pressure sensor **21** according to the second embodiment. FIG. **4**A is a longitudinal cross-sectional view, and FIG. **4**B is a top view.

[0045] The pressure sensor **21** shown in FIGS. **4**A and **4**B includes one flexible printed circuit **12***a*, a plurality of sheet-like pressure sensitive elements **23** divided into strips in which a width direction of the pressure sensor **21** is a longitudinal direction of each of the pressure sensitive elements **23**, and one protective film **14**. The pressure sensitive element **23** is enclosed in an inner space of the pressure sensor **21**, the inner space being formed by the upper surface of the flexible printed circuit **12***a* and the lower surface of the protective film **14**, in a position where a lower surface of the pressure sensitive element **23** faces the upper surface of the flexible printed circuit **12***a* and an upper surface of the pressure sensitive element **23** faces the lower surface of the protective film **14**. The pressure sensitive elements **23** are arranged such that the pressure sensitive elements **23** adjacent to each other are approximately parallel to each other, and certain intervals are provided between the pressure sensitive elements **23**. That is, the plurality of strip-like pressure sensitive elements **23** are arranged approximately at equal intervals such that a width direction of each of the pressure sensitive elements **23** is a longitudinal direction of the pressure sensor **21**. Accordingly, the pressure sensor **21** bends at the positions of the intervals provided between the pressure sensitive elements **23**, so that the stress acting on each pressure sensitive element **23** is only caused by the pressure to be truly detected. As a result, the pressure sensor **21** can emit a sensor signal that accurately reflects only the pressure to be truly detected.

[0046] It should be noted that the electrode of the flexible printed circuit used for the above pressure sensor **21** may have a wiring pattern formed such that the position where each pressure sensitive element **23** is arranged and the position of a wire rod overlap each other as in a flexible printed circuit **12***b* shown in FIG. **5**. In such a case, the pressure sensor **21** can more accurately detect the stress acting on each pressure sensitive element **23**. In addition, in such a case, since the wire rod of the flexible printed circuit **12***b* is not arranged at the position of each interval provided between the pressure sensitive elements **23**, the pressure sensor **21** becomes more easily bent at the position of each interval. Further, in such a case, when the pressure sensor **21** is manufactured, it is sufficient if each pressure sensitive element **23** is arranged according to the wiring pattern of the flexible printed circuit **12***b*, and thus each pressure sensitive element **23** can easily be arranged.

[0047] In addition, the flexible printed circuit used for the above pressure sensor **21** may be formed to be easily bent in such a manner that the position overlapping each interval is formed thinner than the other positions or is formed of a material that is different from the other positions and is more bendable, as in a flexible printed circuit **12***c* shown in FIG. **6**. In such a case, in the pressure sensor **21**, the position of each interval provided between the pressure sensitive elements **23** can be more easily bent.

Third Embodiment

[0048] A wearable sensor **1***c* in the third embodiment is equivalent to the wearable sensor **1** (**1***a*) shown in FIG. **1** in the description of the first embodiment, except that the structure of the pressure sensor incorporated into the fingertip is different.

[0049] FIG. **7** shows a configuration of a pressure sensor **31** according to the third embodiment.

[0050] The pressure sensor **31** shown in FIG. **7** includes two different flexible printed circuits (**32***a* and **32***b*) and one sheet-like pressure sensitive element **33**. The pressure sensitive element **33** is equivalent to the pressure sensitive element **13** of the first embodiment, and is enclosed in an inner space of the pressure sensor **31**, the inner space being formed by an upper surface of the flexible printed circuit **32***a* on the upper side and a lower surface of the flexible printed circuit **32***b* on the lower side, in a position where a upper surface **51** faces a lower surface of the flexible printed circuit **32***a* on the upper side and a lower surface **52** faces an upper surface of the flexible printed circuit **32***b* on the lower side.

[0051] The upper surface **51** of the pressure sensitive element **33** is bonded and fixed to the lower surface of the flexible printed circuit **32***a* on the upper side. Therefore,

tensile stress acts on the upper surface **51** of the pressure sensitive element **33** in relation to the flexible printed circuit **32***a* on the upper side.

[0052] In addition, the lower surface **52** of the pressure sensitive element **33** is bonded and fixed to the upper surface of the flexible printed circuit **32***b* on the lower side. Therefore, compressive stress acts on the lower surface **52** of the pressure sensitive element **33** in relation to the flexible printed circuit **32***b* on the lower side.

[0053] Each of the flexible printed circuit **32***a* on the upper side shown in FIG. **8**A and the flexible printed circuit **32***b* on the lower side shown in FIG. **8**B is provided with only a different positive or negative electrode, unlike the flexible printed circuits (**12***a*, **12***b*, and **12***c*) of the first embodiment and the second embodiment in which the positive and negative electrodes **17** are provided. A positive electrode is provided on the flexible printed circuit **32***a* on the upper side shown in FIG. **8**A, and a negative electrode is provided on the flexible printed circuit **32***b* on the lower side shown in FIG. **8**B. Therefore, in the pressure sensor **31**, a current flows from the flexible printed circuit **32***b* on the lower side to the flexible printed circuit **32***a* on the upper side via the pressure sensitive element **33**. Accordingly, the tensile stress acting on the upper surface **51** of the pressure sensitive element **33** in relation to the flexible printed circuit **32***a* on the upper side and the compressive stress acting on the lower surface **52** of the pressure sensitive element **33** in relation to the flexible printed circuit **32***b* on the lower side are cancelled, so that the pressure sensor **31** can remove the influence of these stresses. As a result, the pressure sensor **31** can emit a sensor signal that accurately reflects only the pressure to be truly detected.

[0054] It should be noted that, as shown in FIG. **8**A and FIG. **8**B, the orientation of the stripes of the electrode of the flexible printed circuit **32***a* on the upper side arranged approximately in a stripe shape and the orientation of the stripes of the electrode of the flexible printed circuit **32***b* on the lower side arranged approximately in a stripe shape may be different from each other. By forming the electrodes of the flexible printed circuits (**32***a* and **32***b*) approximately in a stripe shape, the pressure sensor **31** can easily be bent in the direction of the stripes. In addition, in a case where the orientation of the stripes of the electrode of the flexible printed circuit **32***a* on the upper side and the orientation of the stripes of the electrode of the flexible printed circuit **32***b* on the lower side are different from each other, the amount of change in resistance value when the pressure for each location of the pressure sensor **31** is applied can be made uniform.

[0055] In addition, the flexible printed circuit used for the above pressure sensor **31** may be provided with electrodes the numbers of which are different form each other, as in a flexible printed circuit **42***a* shown in FIG. **9**A and a flexible printed circuit **42***b* shown in FIG. **9**B. The flexible printed circuit **42***a* on the upper side shown in FIG. **9**A is provided with two electrodes formed approximately in a comb-like shape. In addition, the flexible printed circuit **42***b* on the lower side shown in FIG. **9**B is provided with one electrode formed approximately in a stripe shape. In such a case, the pressure sensor **31** can properly separate the pressing pressure on the finger from the other miscellaneous pressures by devising the wire connection as shown in FIG. **10**. As a result, the pressure sensor **31** can remove the influence of the unnecessary pressure detected by the pressure sensitive sensor in the prior art when the wearer of the wearable sensor **1***c* performs a finger-bending action.

[0056] It should be noted that the present invention is not limited to the above embodiments, and can be carried out using any constitutional elements without departing from the gist thereof.

[0057] The above embodiments and modified examples are only examples, and the present invention is not limited to these contents as long as the features of the invention are not impaired. In addition, although various embodiments and modified examples have been described above, the present invention is not limited to these contents. Other aspects considered within the scope of the technical idea of the invention are also included within the scope of the invention.

What is claimed is:

1. A film-like pressure sensor incorporated into a fingertip of a glove-type wearable sensor,

wherein three coordinate axis directions in a three-dimensional orthogonal coordinate system are assumed to be a vertical direction, a longitudinal direction of the pressure sensor, and a width direction of the pressure sensor,

at least one or more flexible printed circuits and one sheet-like pressure sensitive element are laminated in the vertical direction, and

only a pressure applied to a fingertip of a wearer after wearing the wearable sensor is detected.

2. The pressure sensor according to claim **1**,

wherein one of the flexible printed circuits, the pressure sensitive element, and one protective film are laminated in the vertical direction, and

double-sided non-adhesive films are interposed between an upper surface of the flexible printed circuit and a lower surface of the pressure sensitive element and between an upper surface of the pressure sensitive element and a lower surface of the protective film.

3. The pressure sensor according to claim **2**,

wherein side surfaces in the longitudinal direction are protected by a plurality of divided films.

4. The pressure sensor according to claim **1**,

wherein one of the flexible printed circuits, the sheet-like pressure sensitive elements divided into strips in which the width direction of the pressure sensor is a longitudinal direction of each of the pressure sensitive elements, and one protective film are laminated in the vertical direction, and

the pressure sensitive elements divided into strips are arranged approximately at equal intervals in an inner space of the pressure sensor, the inner space being formed by an upper surface of the flexible printed circuit and a lower surface of the protective film, such that a width direction of each of the pressure sensitive elements is the longitudinal direction of the pressure sensor.

5. The pressure sensor according to claim **4**,

wherein the flexible printed circuit has a wiring pattern formed such that a position where each of the pressure sensitive elements divided into strips is arranged overlaps a position of a wire rod.

6. The pressure sensor according to claim **4**,
wherein the flexible printed circuit is formed such that positions overlapping gaps provided between the pressure sensitive elements divided into strips are easily bent.
7. The pressure sensor according to claim **1**,
wherein the pressure sensitive element is sandwiched between two of the flexible printed circuits, and
each of the two flexible printed circuits is provided with a different positive or negative electrode.
8. The pressure sensor according to claim **7**,
wherein each of the two flexible printed circuits is provided with an electrode formed approximately in a stripe shape, and
an orientation of stripes of the electrode of the flexible printed circuit on an upper side and an orientation of stripes of the electrode of the flexible printed circuit on a lower side are different from each other.
9. The pressure sensor according to claim **7**,
wherein the flexible printed circuit on the upper side is provided with two or more electrodes formed approximately in a comb-like shape, and
the flexible printed circuit on the lower side is provided with one electrode formed approximately in a stripe shape.
10. A glove-type wearable sensor,
wherein the pressure sensor according to claim **1** is incorporated into a fingertip.

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