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(71) Applicant 599173826

Watex Co., Ltd.

32 Higashi-Shinmachi, Ota City Gunma Prefecture

(74) [Agent] 100091258

Patent Attorney Yoshimura Naoki

(72) Inventor NUMAGA KAZUHIRO

c/o Watex Co., Ltd.

32 Higashi-Shinmachi, Ota City Gunma Prefecture

(72) Inventor AIZAWA NOBUYUKI

c/o Watex Co., Ltd.

32 Higashi-Shinmachi, Ota City Gunma Prefecture

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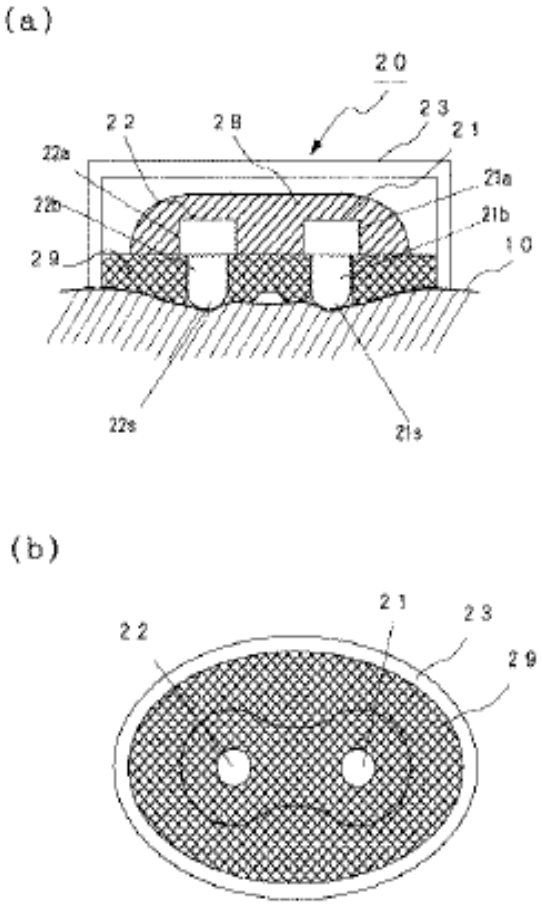
(54) PULSE WAVE SENSOR

(57) Abstract

PROBLEM TO BE SOLVED: To improve the sensitivity of a pulse wave sensor and the accuracy of detection of pulse waves by eliminating unnecessary light from incidenting on a light receiving device.

SOLUTION: The pulse wave sensor 20 is constituted so that a light emitting surface 21s of a light emitting device 21 and a light receiving surface 22s of a light receiving device 22 are made to project onto the face of a sensor case 23 abutting a wrist 10 and the light emitting surface 21s and the light receiving surface 22s are pressed against a wrist 10. The part of the pulse wave sensor excluding the light emitting surface 21s and the light receiving surface 22s is covered with a shell supporting member 29, and the rear sides of the light emitting device 21 and the light receiving device 22 are further coated with an enclosure adhesive 28 with light shutting off property, so that unnecessary light from the outside of the sensor will not come into the light emitting device 22.

[Selected Drawing] FIG. 1



What is claimed is:

1. A pulse wave sensor that is provided with a pair of a light emitting device and a light receiving device, and that detects the pulse waves of a subject under test by detecting in the light receiving device the light emitted from the light emitting device that is reflected from the arteries of the wrist of said subject under test, wherein the light emitting surface of the light emitting device and the light receiving surface of the light receiving device are exposed to the surface of the sensor case abutting a wrist.

2. The pulse wave sensor according to Claim 1 wherein the tip of the light emitting device and the tip of the light receiving device project towards a side of a wrist.

3. The pulse wave sensor according to Claim 1 or Claim 2 wherein the portions except for the light emitting surface of the light emitting devices and the light receiving surface of the light receiving device are covered by a light shutting off member.

4. The pulse wave sensor according to Claim 3 wherein the outer periphery on the wrist side of the light emitting device and the light receiving device is directly covered by an exterior support member having light shutting off property.

5. The pulse wave sensor according to Claim 3 or Claim 4 wherein adhesives having light shutting off property are used as enclosing adhesives for enclosing the light emitting device and the light receiving device in the sensor case.

Detailed Description of the Invention

[Field of the Invention]

[0001] The present invention relates to a pulse wave sensor that emits infrared wavelength light onto a pulse of the wrist of a subject under test and detects the pulse waves of said subject from the light that is reflected by the red corpuscles within the arteries.

[Description of the Prior Art]

[0002] For measuring the pulse rate, normally optical pulse wave sensors are widely used that emit infrared or near infrared light onto blood vessels and from the reflected light or transmitted light detect the pulse waves of the subject under test.

Figures 2(a) and 2(b) illustrate a conventional pulse wave sensor 20A that is attached to a wrist 10 and that measures the pulse waves of the subject under test by detecting the movement of red corpuscles in the arteries of the wrist 10. This pulse wave sensor 20A stores the light emitting device 21 and the light receiving device 22 in the sensor case. The rear sides of the light emitting device 21 and light receiving device 22 are fixed to the sensor case 23 by the translucent sealing adhesive 24. On the exterior (wrist 10 side) of the light emitting surface 21s of the light emitting device 21 and the light receiving surface 22s of the light receiving device 22 is established a transparent acrylic board 25 (for example, see Patent Document 1). The light emitting devices 21 and the light receiving devices 22 have the non-illustrated light emitting chips or light receiving chips covered by optical exterior packaging such as resin.

The light emitting chips or light receiving chips are embedded in the pedestals 21a and 22a of the respective optical exterior packaging. The tips of the light guide parts 21b and 22b that project from the pedestals 21a and 22a become the respective light

emitting surface 21s of the light emitting device 21 and the light receiving surface 22s of the light receiving device 22.

The light emitting surface 21s and the light receiving surface 22s respectively position the pulse wave sensor 20A directly close to the non-illustrated pulse of the wrist 10 so that the test subject's pulse waves are detected using the belt 30 inside the wrist 10. Moreover, it is possible to calculate the frequency of the detected pulse wave by counting and calculating.

Moreover, in Patent Document 1, the light receiving device 22 is constructed by centering the light emitting device 21 and positioning concentrically and symmetrically, but because the number and arrangement of the light emitting devices 21 and the light receiving devices 22 differ with different pulse wave sensors, FIG. 2 shows one respective example for the light emitting devices 21 and for the light receiving devices 22.

[0003] In addition, with the pulse wave sensor 20A, along with covering the light guide part 22b of the receiving light device 22 by the light shielding tube 26 that opens onto the wrist 10 side, on the outer periphery of the write 10 side of the light emitting device 21 and the light receiving device 22, there is arranged a shell combination device supporting member 27 with light shielding capability that supports the wrist 10 side of the light emitting device 21 and the light receiving device 22. Light shielding is used so that light from outside the sensor or near infrared light from the light emitting device 21 is not incident on the light receiving device 22.

[0004]
[Patent Document 1]
Unexamined Japanese Patent Application Publication No.JP2002-360530A

[Problem to be solved by the invention]

[0005] However, in a conventional pulse wave sensor 20A, because an acrylic board 25 is placed between the light emitting device 21 and the light receiving device 22,

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