

Development of Wearable Pulsimeter and Blood Pressure Meter using Hall Device

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The radial pulse waveform obtained by a medical pulsimeter sensor is studied. A pulse sensing part array consists of multiple Hall devices and is located over a skin contacting part with a hard magnetic material. The periodic movement of the magnetic material of skin-contacting part results in changes in a magnetic field of the lower part of the pulse sensing part array, and these changes in a magnetic field is detected by the pulse sensing part array. The analysis of a radial pulse waveform measured noninvasively by detecting the changes of the magnetic field can be used to develop a new diagnostic algorithm of oriental medical apparatus[1-6].

By forming a pulse-sensing part array with magnetic sensors such as Hall devices and the likes, over the skin-contacting part, which consists of a magnetic material, the present pulsimeter increases the integrity of sensors, minimizes the time for searching the pulse and it is applicable widely to a portable pulsimeter and the likes, as shown in Fig. 1.

In the constant pressure chamber, a distance between the skin-contacting part and the pulse-sensing part can be determined based on the magnetic strength of the permanent magnets of the skin-contacting part and magnetic sensitivity of the unit cell of the pulse-sensing part. The magnetic material of the skin-contacting part is a permanent magnet, of which magnetic strength is 200 ~ 300 Oe, it is preferable that the distance is maintained as 1 ~ 3 mm. Furthermore, when a pressure controlling apparatus is adhered to the constant pressure chamber, it is possible to get easily pulse qualities, which are “Bu”, “Jung”, and “Chim” states of the traditional pulse diagnosis. However, to show the function of the pressure controlling apparatus properly, it is necessary to embody the pulsimeter sensor according to the present pulsimeter. This apparatus such as wrist watch or a bracelet transfers the increased pressure to the skin-contacting part intact when pressure of the constant pressure chamber is increased, as shown in Fig. 1.

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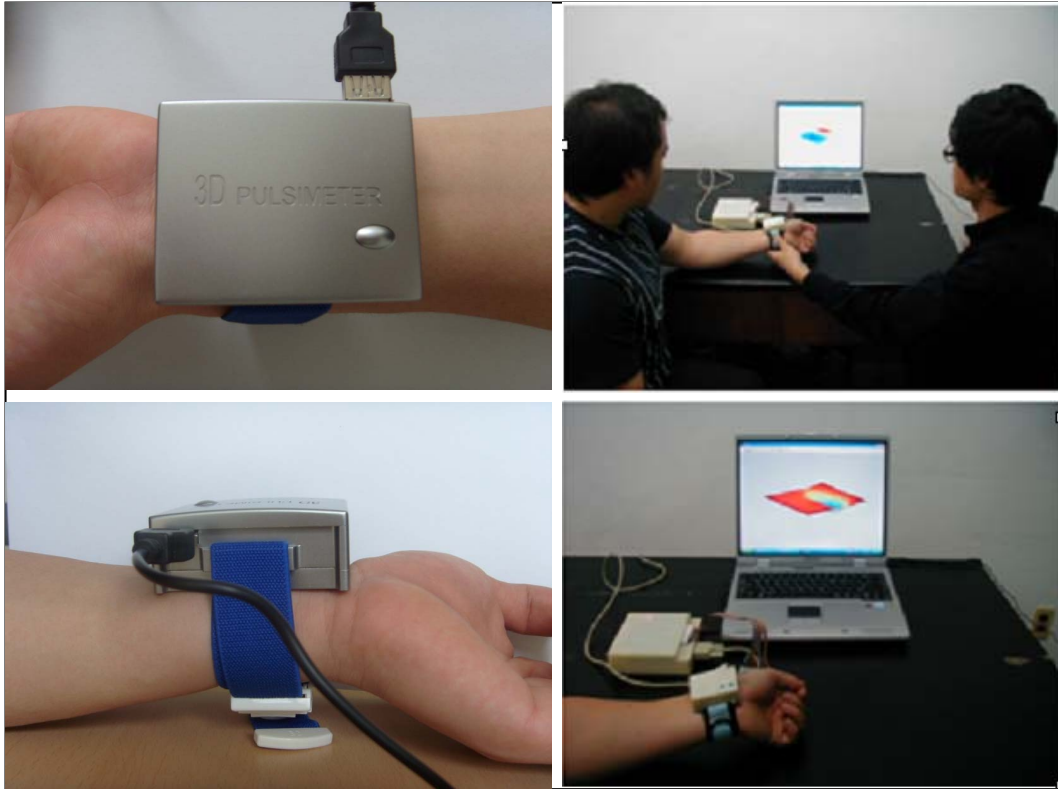


Fig. 1. Four photographs of the real testing product of pulsimeter using multiple Hall devices. Testing product of the present radial pulsimeter and the measuring features, which are into a wrist watch or a bracelet and transfer the increased pressure to the skin-contacting part intact when pressure of the constant pressure chamber is increased.