水晶振動子を用いた超高感度・超ワイドレンジ荷重センサ

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104オーダーの計測レンジを有する荷重センサの小型化・高感度化

Background

To detect biological signals

Concept

○ Improvement of sensitivity
⇒ Change the shape of QCR
High force transmission efficiency

○ Miniaturization
⇒ Unification of holder
Additional
• Wire relay point
• Preloading mechanism

Result of FEM

Fabrication

Fabrication process of QCR

Integration of oscillation circuit

Experiment

Simultaneous measurement of pulse and breath

Conclusion

1. Sensor sensitivity was increased from 574 Hz/N (1) to 896 Hz/N
2. Sensor volume was reduced from 423mm3 to 226mm3 (Volume ratio 53%)
3. Pulse and breath signals were successfully detected simultaneously

Reference

【Reference】Y. Murozaki et al., The Robotics and Mechatronics Conference, 2A2-A11, 2013 in Tsukuba