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## 1. Sensors in Biomedical application

In biomedical field, main applications of biomedical sensors are detecting information of clinical chemistry. In the field of medical clinic and basic research, the biological information needs to be detected to ensure the present state of given biology.

Examples are:

- a. Thermometer - to check the temperature of a patient
- b. Blood ~~pressure~~ <sup>Sensor</sup> - to detect body blood pressure of patient
- c. pH sensor - to detect the atmosphere and condition to improve our living situation.

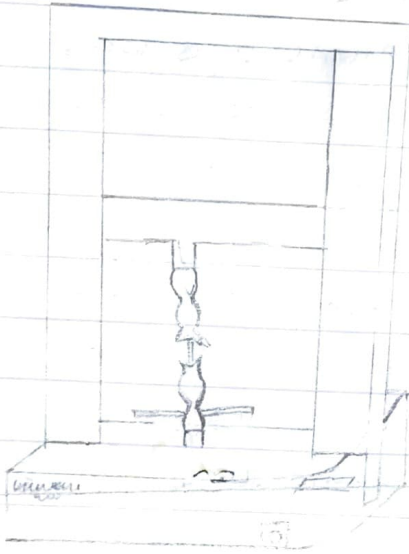
Also in the food industry biomedical sensors could be utilized to measure some enzyme and its concentration to control the process of fabricating food and to analyze the nutritional ingredient of food.

## Actuators in Biomedical application

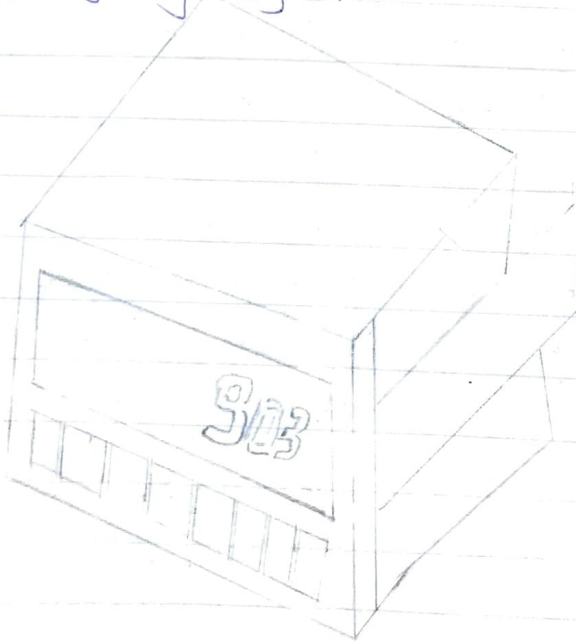
The application for smart actuators in the biomedical field have become more advanced, such as drug delivery using a controlled pump, direction control using microvalves and precise cutting using the smart actuators are known. They also have various applications in detection, analysis diagnosis, drug delivery and cell culture.

## ② Tensile and compression testing machines

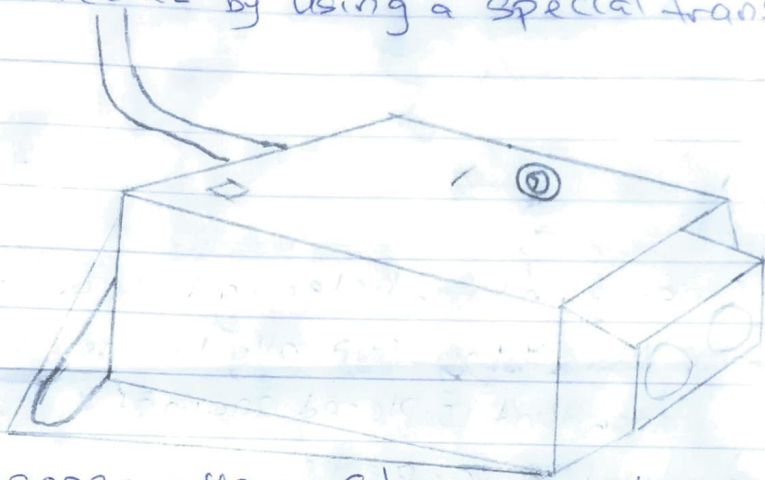
It is used to analyze the elastic rate, bearing rate and strength of the material and the products. Also used to evaluate the product break-down test and the quality of the assembly on the process.



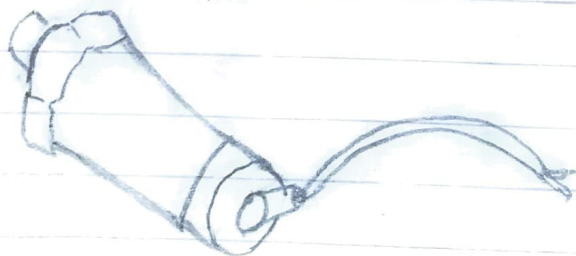
b. Digital indicators - These devices, connected to various sensors and transducers, display measured values digitally and output signals used for control and monitoring of the weighing systems.



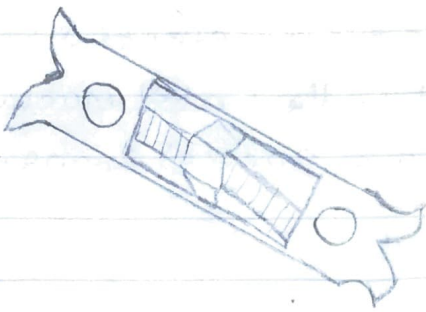
c. Vector Sensor - It is a sensor that detects the transition power in three directions. The sensor can minimize because of a simple structure and is the best for the usage of the gripping force detection, etc. The direction of power can be detected by using the Vector Sensor. The output of the control machine can be easily connected by using a special transmitter.



d. Pressure sensor - Using silicon or sapphire technology and strain gage, these high-accurate and prolonged stability-type, pressure sensors are sensor that measure pressure as electric signals. Connect to various measuring devices for measurement purposes; the sensors perform displaying, recording, controlling, monitoring the pressure, etc.



2. Force sensors - used in both scales, various types of scales, game consoles, home appliances, load sensors, etc, these sensors are sensors for mass production that use strain gages.



### 3. Stethoscope

A medical instrument for listening to the action of someone's heart or breathing, typically having a small disc-shaped resonator that is placed against the chest, and two tubes connected to earpieces.

b. Sphygmomanometer - An instrument for measuring blood pressure, typically consisting of an inflatable rubber cuff which is applied to the arm and connected to a column of mercury next to a graduated scale, enabling the determination of systolic and diastolic blood pressure by increasing and gradually releasing the pressure in the cuff.