3) • Sphygmomanometer: This is a device used to measure blood pressure and is composed of an inflatable cuff to collapse and release the artery under the cuff in a controlled manner, and a mercury or aneroid manometer to measure the pressure.

A sphygmomanometer consist of an inflatable cuff, a measuring unit, and a mechanism for inflation which could be a manually operated bulb and valve, or an electrical pump.

• Medical thermometer: This device is used to measure human body temperature. They are either digital or analog with mercury in a glass.

Digital thermometers contain a small computing mechanism and a resistor. A change in temperature causes the sensor to notice a change in resistance. The computer then converts the difference in resistence to a difference in temperature and outputs it in degrees.

Mercury-in-glass thermometers are very simple. As the mercury gets hotter, it expands by an amount that relates directly ~~with~~ to the temperature increase.

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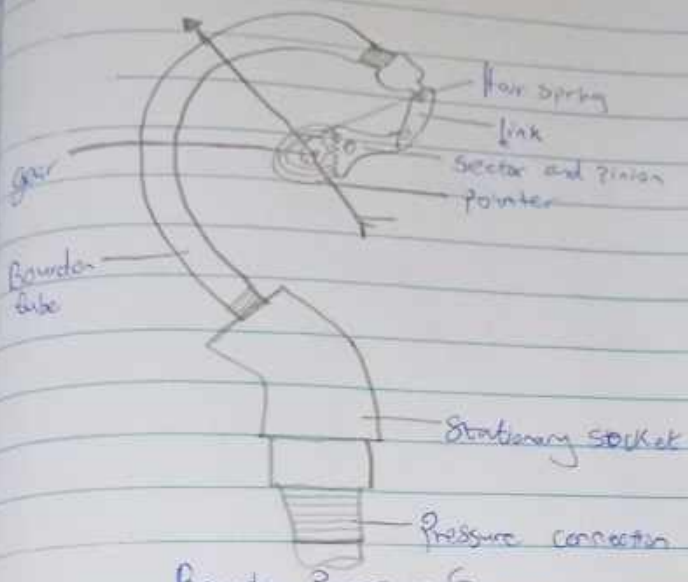
Functional Elements of a Bourdon Pressure Gauge




Bourdon Pressure Gauge

In this system, the Bourdon tube acts as the primary sensing element and a variable conversion element. It senses the input quantity (which is pressure). On account of the pressure, the closed end of the Bourdon tube is displaced. Thus, the pressure is converted to small displacement. The closed end of the Bourdon tube is connected through mechanical linkage to a sector-pinion gearing arrangement. The gearing arrangement amplifies the small displacement and makes the pointer to rotate through a large angle. The mechanical linkage thus acts as a data transmission element, while the gearing element acts as a data manipulation element. The dial scale on the gauge body plays the function of data presentation element and conveys the information about the quantity being measured. The information is displayed in analog form.

used: used in:

a. Atomizers/Aerosol Generation: Atomizers can deliver medication highly efficiently to the respiratory tract. The homogeneity of the aerosol is critical and piezo-transducer driven membranes oscillating at high-frequency in the ultrasonic range can produce droplets of a predefined size

b. Scanners: CT, MRI, and PT scanning instruments are used in hospitals, clinics and palliative care units for examination and diagnosis purposes. These scanners are powered with linear actuators, which allow easy movement in any direction.

c. Laser Positioning Equipment: This equipment needs to be positioned appropriately for desired results. Linear actuators help control the accuracy and positioning of the beam in the laser positioning equipment.

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1). Sensors:
A sensor is a device module machine or subsystem that whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor. In the field of biomedical engineering, these sensors could be used:

a. EMG sensor: This is known as an electromyography sensor. It is a method to evaluate motor unit action potential activity in a muscle region. As electrical signals travel through nerves to neuromuscular junctions, the change in electrical potentials (voltage) can be measured.

b. GSR Sensor: This is known as a galvanic skin response sensor and it refers to changes in sweat gland activity that are reflective of the intensity of our emotional state otherwise known as emotional arousal

c. Heart Rate Sensors: These are personal monitoring devices that allows a user to track and display their heart rate in real time or for studies.

-Actuators:
An actuator is a component of a machine that is responsible for moving and controlling a mechanism or system by, for example opening a valve. They require a control signal and a source of energy. In biomedical engineering these actuators could be