generated through the hand tapping, and a peak output power of 2.67mW is measured with a load resistance of 9 MΩ. This gives a power density of 166uW/m ^{3}. The energy generated from different body motions can thus be stored for further use. FIG. 4 shows the charging curve for commercial capacitors with varying capacitances of the textile based TENG. The charging curves of capacitors with capacitance of l μF, 4.7pF, and 10μF are illustrated in FIG. 4e for hand tapping and FIG. 4f for foot tapping. To a lpF capacitor, the charged voltage can reach up to 19V in around 60s. And a capacitor with a capacitance of 10μF can be charged up to 3V in around 60s. When compared with hand tapping, the power generation performance of foot stepping is an enhancement.

[059] Strain Sensor for Finger Bending Sensing and Robotics Control

[060] Fleight-Varying Multi-Arch Strain Sensor

[061] Where two or more arches are provided, each of said two or more arches may be of a different size (e.g. height) to at least one other of said two or more arches. In some embodiments, the arches may be on different portions or strips of textile. In other embodiments, there may be a single strip of the sensory textile with the two or more arches forming a series of arches along the strip.

[062] Additionally, a multi-arch varying-height design could provide a wider sensing range from small strain to large strain. Results are shown in FIG. 5a for arch heights of 1mm, 3mm, 6mm, 9mm, and 12mm respectively. Thus, the series of arches are of progressively larger size. The real time output of this multi-arch strain sensor under 30% strain, 100% strain, and 160% strain is depicted in FIG. 5e. Relevantly, FIG. 5 shows FIG. 5(a) a single-arch based strain sensor with different arch height under different strain conditions. The higher the arch the greater the ability to cope with elongation or strain, and the greater the maximum attainable triboelectric charge. FIG. 5(b) is a schematic diagram of multi-arc strain sensor under stretching. It shows the progressive flattening of arches under successively greater elongation of the substrate 218. The varying arch height enables detection of the amount of elongation or strain - the different arch heights result in different triboelectric charge values and thus a specific triboelectric charge is indicative of a specific elongation such that measuring the triboelectric charge may specifically determine the elongation or strain. FIG. 5(c) is a photo of as-fabricated sensor 220 with five, progressively higher arches. FIG. 5(d) is the modelled output voltage of the five arch sensor of FIG. 5(c), and FIG. 5(e) real time output of this multi-arch strain sensor 220 under 30% strain, 100% strain, and 160% strain. FIG. 5e shows a clear, direct correlation between the amount of elongation and the output voltage.