Abstract

A bioenergy hybrid-twisted filament and uses thereof, comprising bioenergy yarns, bioenergy fabrics and products made therefrom. The bioenergy hybrid-twisted filament comprises a first filament and a second filament that are hybrid-twisted, the first filament comprising a first polymer matrix and nanoparticles dispersed within the first polymer matrix, and the nanoparticles comprising elements selected from the following group: gold, silver, titanium, germanium, zinc, aluminum, magnesium, silicon, copper, calcium, iron, barium, potassium, sodium, manganese, nickel, gallium, platinum, and combinations thereof; the material of the second filament is different from that of the first filament.

Fig. 3A