CLAIMS

1. An assembly comprising an elastic semi-conductive or conductive track and a flexible conductive support base assembly arranged on a fabric, the flexible conductive support base being a textile comprising conductive fibers and having at least one of its ends round shaped, wherein at least one end of the track is in contact with said at least one round shaped end of at least one flexible conductive support base, and the non-contact area by the track of the at least one flexible conductive support base is in electrical contact with a rigid electrical component~~.~~, wherein each end of the track are treading on two different flexible conductive support bases.

~~2. The assembly of claim 1 , wherein each end of the track are treading on two different flexible conductive support bases.~~

~~3~~2. The assembly of claim 1~~ or 2~~, wherein on the non~~-treaded~~contact area of one of the flexible conductive support bases there is arranged a rigid electrical component, and the non~~-treaded~~ contact area of the other flexible conductive support base is adapted to be used as an electrode.

~~4~~3. The assembly of ~~any of~~ claim~~s~~ 1~~-3~~, wherein the flexible conductive support base is attached to the fabric with an adhesive.

~~5~~4. The assembly of ~~any of~~ claim~~s~~ 1~~-4~~, wherein the track comprises a layer of silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material.

~~6~~5. The assembly of ~~any of~~ claim~~s~~ 1~~-5~~, wherein the track comprises a layer of a room temperature curing silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material selected from carbon fibres, carbon black, nickel coated graphite, copper fibres and mixtures thereof.

~~7~~6. The assembly of ~~any of~~ claim~~s~~ 1~~-6~~, wherein the ~~thickness of the elastic and electrically conductive~~ track ~~comprising~~ comprises a thickness of at least 25 µm~~, 50 µm, 75 µm, 100 µm, 120 µm, 130 µm, 140 µm, 150 µm, 160 µm, 170 µm, 180 µm, 190 µm, 200 µm, 210 µm, 220 µm, 230 µm, 240 µm, 250 µm, 260 µm, 270 µm, 280 µm, 290 µm, 300 µm, 325 µm, 350 µm, 375 µm, 400 µm, 425 µm, 450 µm, 475 µm, 500 µm, 525 µm, 550 µm, 575 µm, 600 µm, 625 µm, 650 µm, 675 µm, 700 µm, 725 µm, 750 µm, 775 µm, 800 µm, 825 µm, 850 µm, 875 µm, 900 µm, 925 µm, 950 µm, 975 µm, 1000 µm~~.

~~8~~7. The assembly of claim ~~5~~4, wherein the track is integrated into the ~~textile~~ fabric ~~substrate~~ and partially into the at least one round shaped end of the flexible conductive support base by anchoring the silicone rubber and/or the fluorosilicone rubber with the structure of the fibres of the ~~textile~~ fabric ~~substrate~~ and of the flexible conductive support base when ~~cured~~ the silicone rubber and/or the fluorosilicone rubber is cured at room temperature after being screen-printed thereon~~ them~~.

~~9~~8. The assembly of ~~any of~~ claim~~s 1-8~~4, wherein the silicone rubber and/or flourosilicone rubber is screen- printed on a fabric and on the at least one round shaped end of the flexible conductive support base applying a pressure comprising at least 0.1 Kg/m^2~~, at least 0.2 Kg/m^2, at least 0.3 Kg/m^2, at least 0.4 Kg/m^2, at least 0.5 Kg/m^2, at least 0.6 Kg/m^2, at least 0.7 Kg/m^2, at least 0.8 Kg/m^2, at least 0.9 Kg/m^2, at least 1 Kg/m^2~~.

~~10~~9. The assembly according ~~of any~~ of claim~~s 1-9~~4, wherein the cured temperature of the silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material is of from 20°C to 200 °C~~, of from 50 °C to 140 °C or of from 100 °C to 120 °C~~.

~~11~~10. The assembly according of ~~any of~~ claim~~s 1-10~~4, wherein the cured temperature of the silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material is ~~no more than 5 °C, no more than 10 °C, no more than 15 °C, no more than 20 °C, no more than 25 °C, no more than 30 °C, no more than 35 °C, no more than 40 °C, no more than 45 °C, no more than 50 °C, no more than 55 °C, no more than 60 °C, no more than 65 °C, no more than 70 °C, no more than 75 °C, no more than 80 °C, no more than 85 °C, no more than 90 °C, no more than 95 °C, no more than 100 °C, no more than 1 10 °C, no more than 120 °C, no more than 130 °C, no more than 140 °C, no more than 150 °C, no more than 160 °C, no more than 165, no more than 170 °C, no more than 180 °C, no more than 190 °C, no more than 200 °C, no more than 210 °C, no more than 220 °C, no more than 230 °C, no more than 240 °C, no more than 250 °C, no more than 260 °C, no more than 270 °C, no more than 280 °C, no more than 290 °C or~~ no more than 300 °C.

~~12~~11. A sensor adapted to be incorporated in a garment, ~~said~~ the sensor comprising an assembly of claim ~~3~~2, wherein the electrode defined by the non-contact area is adapted to obtain physiological signals through its contact with the skin of the wearer of the garment.

~~13~~12. The sensor of claim ~~12~~11, wherein a track is electrically isolated from its contact with the skin of the wearer of the garment, and a rigid electrical component is an electrical connector adapted to transmit a physiological signal obtained through the electrode to an electronic instrument.

~~14~~13. The sensor of claim ~~12~~ 11~~or 13~~, wherein the electrode comprises a conductive fabric made of conductive fibers and non-conductive fibers.

~~15~~14. The sensor of ~~any of~~ claim~~s 12-14~~11, wherein the electrode is characterized in that the conductive layer comprises a plurality of orifi~~c~~es at least partially filled with a~~n~~ silicone rubber ~~throughout the conductive area~~.

~~16~~15. A device comprising the sensor as defined in any of claims 12-15, and an electronic instrument for receiving, collecting, storing, processing and/or transmitting data from ~~said~~ the sensor.

~~17~~16. A garment comprising the device of claim ~~16~~15.

~~18~~17. A method for monitoring a physiological signal of a user comprising

- receiving, collecting, storing, processing and/or transmitting one or more parameters indicative of at least one physiological signal of a user originating from at least one sensor as defined in claim ~~13~~ 12 incorporated in a garment; and

- evaluating ~~said~~ the physiological signal along the time.

~~19~~18. The method of claim ~~18~~17, wherein the physiological signal is an ECG signal.

~~20. A sensor which comprises an electrode, a track and an electrical connector, wherein, the track is comprising an electrically conductive flexible and elastic material that comprises an electrically conductive material that is non-continguous that when stretched is able to transmit a signal from an electrode to an electrical connector and from an electrical connector to an electrode.~~

21 . The sensor of claim 20, wherein an electrically conductive flexible and elastic material is constructed of silicone rubber and/or fluorosilicone rubber and an electrically conductive material.

22. The sensor of claim 20 or 21 , wherein the silicone rubber and/or fluorosilicone rubber is loaded with an amount comprising no more than 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 11 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30% w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w, 58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically conductive material.

23. The sensor of any of claims 20-22, wherein the electrically conductive material is selected from the group of carbon fibers, carbon black, nickel coated graphite, copper fibres or a metal powder.

24. The sensor of claim 23, wherein the carbon black is selected from furnace black, lamp black, thermal black, acetylene black, channel black.

25. The sensor of claim 23 or 24, wherein the metal powder is selected from silver, nickel, and copper.

26. The sensor of any of claims 20-25, wherein a resistance value, from one end of a sensor, to the other is less than 50 KΩ, 100 KΩ, 150 KΩ, 200 KΩ, 250 KΩ, 300 KΩ, 350 KΩ, 400 KΩ, 450 KΩ, 500 KΩ, 550 KΩ, 600 KΩ, 650 KΩ, 700 KΩ, 750 KΩ, 800 KΩ, 850 KΩ, 900 KΩ, 950 KΩ or 100 KΩ when the flexible material is stretched.

27. The sensor of any of claims 20-26, wherein the sensor is able to stretch at least 1 %, at least 2%, at least 3%, at least 4%, at least 5 %, 6%, at least 7%, at least 8%, at least 9%, at least 10%, at least 15%, at least 20%, at least 25%, at least 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 55%, at least 60%, at least 65%, at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95% at least 100%, at least 105%, at least 1 10%, at least 115%, at least 120%, at least 125%, at least 130%, at least 135%, at least 140%, at least 145%, at least 150%, at least 155%, at least 160%, at least 165%, at least 170%, at least 175%, at least 180%, at least 185%, at least 190%, at least 195%, at least 200%, at least 210%, at least 220%, at least 230%, at least 240%, at least 250%, at least 260%, at least 270%, at least 280%, at least 290%, at least 300% or more as compared to the same sensor when it is not stretched.

28. The sensor of any of claims 20-27, wherein the silicone rubber is cured at a temperature of no more than 5 °C, no more than 10 °C, no more than 15 °C, no more than 20 °C, no more than 25 °C, no more than 30 °C, no more than 35 °C, no more than 40 °C, no more than 45 °C, no more than 50 °C, no more than 55 °C, no more than 60 °C, no more than 65 °C, no more than 70 °C, no more than 75 °C, no more than 80 °C, no more than 85 °C, no more than 90 °C, no more than 95 °C, no more than 100 °C, no more than 1 10 °C, no more than 120 °C, no more than 130 °C, no more than 140 °C, no more than 150 °C, no more than 160 °C, no more than 165, no more than 170 °C, no more than 180 °C, no more than 190 °C, no more than 200

°C, no more than 210 °C, no more than 220 °C, no more than 230 °C, no more than 240 °C, no more than 250 °C, no more than 260 °C, no more than 270 °C, no more than 280 °C, no more than 290 °C or no more than 300 °C.

29. The sensor of any of claims 20-28, wherein the silicone rubber and/or fluorosilicone rubber is liquid printed.

30. The sensor of any of claims 20-29, wherein the silicone rubber and/or fluorosilicone rubber is screen printed.

31. The sensor of any of claims 20-30, wherein the silicone rubber and/or fluorosilicone rubber has a molecular weight of at least 100 g/mol, 200 g/mol, 300 g/mol, 325 g/mol, 350 g/mol, 375 g/mol, 400 g/mol, 425 g/mol, 450 g/mol, 475 g/mol, 500 g/mol, 525 g/mol, 550 g/mol, 575 g/mol, 600 g/mol, 625 g/mol, 650 g/mol, 674 g/mol, 700 g/mol, 800 g/mol, 900 g/mol, 000 g/mol, or more.

32. The sensor of any of claims 20-31 , wherein the silicone rubber and/or fluorosilicone rubber has a moecular weight of no more than 100 g/mol, 200 g/mol, 300 g/mol, 325 g/mol, 350 g/mol, 375 g/mol, 400 g/mol, 425 g/mol, 450 g/mol, 475 g/mol, 500 g/mol, 525 g/mol, 550 g/mol, 575 g/mol, 600 g/mol, 625 g/mol, 650 g/mol, 674 g/mol, 700 g/mol, 800 g/mol, 900 g/mol or 1000 g/mol.

33. The sensor of any of claims 20-32, wherein the electrode is characterized in that the conductive layer comprises a plurality of orificies filled with an silicone rubber throughout the conductive area.

34. The sensor of any of claims 20-33, wherein the resistance of the electrode is at least 0.5Ω, at least 1 Ω, at least 2 Ω, at least, 3 Ω, at least 4 Ω, at least 5 Ω, at least 6 Ω, at least 7 Ω, at least 8 Ω, at least 9 Ω, at least 10 Ω, at least 11 Ω, at least 12 Ω, at least 13 Ω, at least 14 Ω, at least 15 Ω or more.

35. The sensor of any of claims 20-34, wherein the track is integrated into the textile fabric substrate and partially into the at least one round shaped end of the conductive support base by anchoring the silicone with the structure of the fibres of the textile fabric substrate and the conductive support base.

36. The sensor of any of claims 20-35, where in at least an elastic and electrically conductive track integrated into the fabric, and wherein the elastic and electrically conductive track comprises a silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material, wherein the thickness of the elastic and electrically conductive track is at least 25 µm, 50 µm, 75 µ^{n}τι, 100 µm, 120 µm, 130 µm, 140 µm, 150 µm, 160 µm, 170 µπτι, 180 µm, 190 µm, 200 µm, 210 µm, 220 µm, 230 µm, 240 µm, 250 µm, 260 µητι, 270 µm, 280 µm, 290 µm, 300 µm, 325 µπι, 350 µm, 375 µm, 400 µm, 425 µm, 450 µm, 475 µm, 500 µm, 525 µm, 550 µm, 575 µm, 600 µm, 625 µm, 650 µm, 675 µm, 700 µm, 725 µm, 750 µm, 775 µm, 800 µm, 825 µητι, 850 µm, 875 µm, 900 µm, 925 µm, 950 µm, 975 µm, 1000 µm.

37. The sensor of any of claims 20-36, wherein the resistance of the track is at least 1 Ω, at least 2 Ω, at least, 3 Ω, at least 4 Ω, at least 5 Ω, at least 6 Ω, at least 7 Ω, at least 8 Ω, at least 9 Ω, at least 10 Ω, at least 11 Ω, at least 12 Ω, at least 13 Ω, at least 14 Ω, at least 15 Ω, at least 16 Ω, at least 17 Ω, at least 18 Ω, at least 19 Ω, at least 20 Ω, at least 21 Ω, at least 22 Ω, at least 23 Ω, at least 24 Ω, at least 25 Ω, at least 26 Ω, at least 27 Ω, at least 28 Ω, at least 29 Ω,

at least 30 Ω, at least 31 Ω, at least 32 Ω, at least 33 Ω, at least 34 Ω, at least 35 Ω, at least 36 Ω, at least 37 Ω, at least 38 Ω, at least 39 Ω, at least 40 Ω, at least 41 Ω, at least 42 Ω, at least 43 Ω, at least 44 Ω, at least 45 Ω, at least 46 Ω, at least 47 Ω, at least 48 Ω, at least 49 Ω, at least 50 Ω, or more.

38. The sensor of any of claims 20-37, wherein a track is electrically isolated from its contact with the skin of the wearer of the garment, and a rigid electrical component is an electrical connector adapted to transmit a physiological signal obtained through the electrode to an electronic instrument.

39. The sensor of any of claims 20-38, wherein the sensor is able to detect physiological signals.

40. The sensor of claim 39, wherein the physiological signals detected are cardiac pulse, respiratory frequency, electrodermal response (EDR), measurement of electrical skin conductivity, electrocardiography (ECG), temperature, skin impedance, transpiration and electromyography (EMG).

41. A fabric which comprises a sensor, wherein the sensor includes an electrode, a track and an electrical connector, wherein, an elastic semi-conductive or conductive track and a flexible conductive support base assembly arranged on a fabric substrate, the flexible conductive base being a textile comprising conductive and non-conductive fibers and having at least one of its ends round-shaped, wherein at least one end of the track is treading on said at least one end round-shaped of at least one flexible conductive support base, and the non-treaded area by the track of the at least one flexible conductive support base is in electrical contact with a rigid electrical component.

42. A process for the preparation of a fabric as defined in claim 41 , which comprises the steps of:

a) liquid printing a first layer of silicone rubber and/or fluorosilicone rubber loaded with an amount between 5% w/w to 40% w/w of an electrically conductive material into the fabric;

b) pre-curing the first layer for up one minute at a temperature between 80 °C to 200 °C;

c) curing the first layer at room temperature.

43. The process of claim 41 or 42, wherein the liquid-printing step comprises applying a pressure comprising at least 0.1 Kg/m^2, at least 0.2 Kg/m^2, at least 0.3 Kg/m^2, at least 0.4 Kg/m^2, at least 0.5 Kg/m^2, at least 0.6 Kg/m^2, at least 0.7 Kg/m^2, at least 0.8 Kg/m^2, at least 0.9 Kg/m^2, at least 1 Kg/m^2 when printing the silicone rubber and/or fluorosilicone rubber loaded with the electrically conductive material directly to the fabric.

44. A physiological signal fabric adapted to be incorporated in a garment, said fabric comprising the sensor as defined in any of claims 20-40, wherein the electrode is adapted to obtain physiological signals through its contact with the skin of the wearer of the garment.

45. A device comprising the sensor as defined in any of claims 20-40, and an electronic instrument for receiving, collecting, storing, processing and/or transmitting data from said sensor.

46. A garment comprising the device of claim 45.

47. A method for monitoring a physiological signal of a user comprising

- receiving, collecting, storing, processing and/or transmitting one or more parameters indicative of at least one physiological signal of a user originating from at least one sensor as defined in any of claims 20-40 incorporated in a garment; and

- evaluating said physiological signal along the time.

48. The sensor of any of claims 20-40, wherein the resistance of the electrode is at least 0.5 Ω, at least 1 Ω, at least 2 Ω, at least, 3 Ω, at least 4 Ω, at least 5 Ω, at least 6 Ω, at least 7 Ω, at least 8 Ω, at least 9 Ω, at least 10 Ω, at least 11 Ω, at least 12 Ω, at least 13 Ω, at least 14 Ω, at least 15 Ω or more.

49. The sensor of any of claims 20-40, wherein the sensor is able to detect physiological signals.

50. The sensor of claim 49, wherein the physiological signals detected are cardiac pulse, respiratory frequency, electrodermal response (EDR), measurement of electrical skin conductivity, electrocardiography (ECG), temperature, skin impedance, transpiration and electromyography (EMG).

51 . A fabric which comprises a sensor, wherein the sensor includes an electrode, a track and an electrical connector, wherein, the track is comprising an electrically conductive flexible material that is noncontiguous that when stretched is able to transmit a signal from an electrode to an electrical connector and from an electrical connector to an electrode that when stretched is able to transmit a signal from an electrode to an electrical connector and from an electrical connector to an electrode.

52. The fabric of claim 51 , wherein an electrically conductive flexible material is constructed of silicone rubber and/or fluorosilicone rubber and an electrically conductive material.

53. The fabric of claim 51 or 52, wherein the electrically conductive material is selected from the group of carbon fibers, carbon black, nickel coated graphite, copper fibres or a metal powder.

54. The fabric of any of claims 51-53, wherein the carbon black is selected from furnace black, lamp black, thermal black, acetylene black, channel black.

55. The fabric of any of claims 51-54, wherein the metal powder is selected from silver, nickel, and copper.

56. The fabric of any of claims 51 -55, wherein a resistance value, from one end of a sensor, to the other is less than 50 KΩ, 100 KΩ, 150 KΩ, 200 KΩ, 250 KΩ, 300 KΩ, 350 KΩ, 400 KΩ, 450 KΩ, 500 KΩ, 550 KΩ, 600 KΩ, 650 KΩ, 700 KΩ, 750 KΩ, 800 KΩ, 850 KΩ, 900 KΩ, 950 KΩ or 1000 KΩ when the flexible material is stretched.

57. The fabric of any of claims 51 -56, wherein the silicone rubber is cured at a temperature of no more than 5 °C, no more than 10 °C, no more than 15 °C, no more than 20 °C, no more than 25 °C, no more than 30 °C, no more than 35 °C, no more than 40 °C, no more than 45 °C, no more than 50 °C, no more than 55 °C, no more than 60 °C, no more than 65 °C, no more than 70 °C, no more than 75 °C, no more than 80 °C, no more than 85 °C, no more than 90 °C, no more than 95 °C, no more than 100 °C, no more than 1 10 °C, no more than 120 °C, no more than 130 °C, no more than 140 °C, no more than 150 °C, no more than 160 °C, no more than 165, no more than 170 °C, no more than 180 °C, no more than 190 °C, no more than 200 °C, no more than 210 °C, no more than 220 °C, no more than 230 °C, no more than 240 °C, no more than 250 °C, no more than 260 °C, no more than 270 °C, no more than 280 °C, no more than 290 °C or no more than 300 °C.

58. The fabric of any of claims 51-57, wherein the silicone rubber and/or fluorosilicone rubber is liquid printed.

59. The fabric of any of claims 51-58, wherein the silicone rubber and/or fluorosilicone rubber is screen printed.

60. The fabric of any of claims 51-59, wherein the silicone rubber and/or fluorosilicone rubber has a molecular weight of at least 100 g/mol, 200 g/mol, 300 g/mol, 325 g/mol, 350 g/mol, 375 g/mol, 400 g/mol, 425 g/mol, 450 g/mol, 475 g/mol, 500 g/mol, 525 g/mol, 550 g/mol, 575 g/mol, 600 g/mol, 625 g/mol, 650 g/mol, 674 g/mol, 700 g/mol, 800 g/mol, 900 g/mol, 1000 g/mol, or more.

61 . The fabric of any of claims 51-60, wherein the silicone rubber and/or fluorosilicone rubber has a moecular weight of no more than 100 g/mol, 200 g/mol, 300 g/mol, 325 g/mol, 350 g/mol, 375 g/mol, 400 g/mol, 425 g/mol, 450 g/mol, 475 g/mol, 500 g/mol, 525 g/mol, 550 g/mol, 575 g/mol, 600 g/mol, 625 g/mol, 650 g/mol, 674 g/mol, 700 g/mol, 800 g/mol, 900 g/mol or 1000 g/mol.

62. The fabric of any of claims 51-61 , wherein the resistance of the electrode is at least 0.5 Ω, at least 1 Ω, at least 2 Ω, at least, 3 Ω, at least 4 Ω, at least 5 Ω, at least 6 Ω, at least 7 Ω, at least 8 Ω, at least 9 Ω, at least 10 Ω, at least 1 1 Ω, at least 12 Ω, at least 13 Ω, at least 14 Ω, at least 15 Ω or more.

63. The sensor or device of any of claims 12-16, wherein the resistance of the track is at least 1 Ω, at least 2 Ω, at least, 3 Ω, at least 4 Ω, at least 5 Ω, at least 6 Ω, at least 7 Ω, at least 8 Ω, at least 9 Ω, at least 10 Ω, at least 1 1 Ω, at least 12 Ω, at least 13 Ω, at least 14 Ω, at least 15 Ω, at least 16 Ω, at least 17 Ω, at least 18 Ω, at least 19 Ω, at least 20 Ω, at least 21 Ω, at least 22 Ω, at least 23 Ω, at least 24 Ω, at least 25 Ω, at least 26 Ω, at least 27 Ω, at least 28 Ω, at least 29 Ω, at least 30 Ω, at least 31 Ω, at least 32 Ω, at least 33 Ω, at least 34 Ω, at least 35 Ω, at least 36 Ω, at least 37 Ω, at least 38 Ω, at least 39 Ω, at least 40 Ω, at least 41 Ω, at least 42 Ω, at least 43 Ω, at least 44 Ω, at least 45 Ω, at least 46 Ω, at least 47 Ω, at least 48 Ω, at least 49 Ω, at least 50 Ω, or more.

64. The fabric of any of claims 51-62, wherein the sensor is able to detect physiological signals.

65. The fabric of claim 64, wherein the physiological signals detected are cardiac pulse, respiratory frequency, electrodermal response (EDR), measurement of electrical skin conductivity, electrocardiography (ECG), temperature, skin impedance, transpiration and electromyography (EMG).

66. The fabric of any of claims 51-62, which further comprises a layer of an insulating material covering the track.

67. The fabric of any of claims 51-62, wherein the fabric comprises an electrode to be placed in contact with the skin of an user.

68. The fabric of any of claims 51-62, wherein the electrode comprises a conductive fabric made of conductive fibers and non-conductive fibers.

69. The fabric of any of claims 51-62, wherein the electrode comprises a layer of silicone rubber and/or fluorosilicone rubber loaded with an amount comprising at least 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 11 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30%

w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w, 58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically conductive material.

70. The fabric of any of claims 51-62, wherein the silicone rubber and/or fluorosilicone rubber is loaded with an amount comprising no more than 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 1 1 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30% w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w, 58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically material.

71. The fabric of any of claims 51-62, wherein the fabric is able to stretch at least 1 %, at least 2%, at least 3%, at least 4%, at least 5 %, 6%, at least 7%, at least 8%, at least 9%, at least 10%, at least 15%, at least 20%, at least 25%, at least 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 55%, at least 60%, at least 65%, at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95% at least 100%, at least 105%, at least 110%, at least 1 15%, at least 120%, at least 125%, at least 130%, at least 135%, at least 140%, at least 145%, at least 150%, at least 155%, at least 160%, at least 165%, at least 170%, at least 175%, at least 180%, at least 185%, at least 190%, at least 195%, at least 200%, at least 210%, at least 220%, at least 230%, at least 240%, at least 250%, at least 260%, at least 270%, at least 280%, at least 290%, at least 300% or more as compared to the same fabric when it is not stretched.

72. The fabric of any of claims 51-62, wherein at least 5%, at least 10%, at least 15%, at least 20%, at least 25%, at least 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 55%, at least 60%, at least 65%, at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or at least 100% of the electrode and track are in contact with the skin on an individual.

73. The fabric of any of claims 51-62, wherein no more than 5%, no more than 10%, no more than 15%, no more than 20%, no more than 25%, no more than 30%, no more than 35%, no more than 40%, no more than 45%, no more than 50%, no more than 55%, no more than 60%, no more than 65%, no more than 70%, no more than 75%, no more than 80%, no more than 85%, no more than 90%, no more than 95%, or no more than 100% of the electrode and track are in contact with the skin of an individual.

74. The fabric of any of claims 51-62, wherein the proportion of a flexible semi-conductive or conductive material in contact with the skin of an individual is at least 5%, at least 10%, at least 15%, at least 20%, at least 25%, at least 30%, at least 35%, at least 40%, at least 45%, at least 50%, at least 55%, at least 60%, at least 65%, at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or at least 100% of the total conductive layer.

75. The fabric of any of claims 51-62, the proportion of a flexible semi-conductive or conductive material to be in contact with the skin of an individual is no more than 5%, no

more than 10%, no more than 15%, no more than 20%, no more than 25%, no more than 30%, no more than 35%, no more than 40%, no more than 45%, no more than 50%, no more than 55%, no more than 60%, no more than 65%, no more than 70%, no more than 75%, no more than 80%, no more than 85%, no more than 90%, no more than 95%, or no more than 100% of the electrode and track are in contact with the skin of an individual.

76. The fabric of any of claims 51-62, wherein an electrically conductive material is loaded with an amount comprising from 5% w/w to 40% w/w comprising:

a) diorganopolysiloxane gum having silicon-bonded alkenyl groups;

b) organohydrogenpolysiloxanes;

c) a platinum catalyst; and

d) between 5-40 % w/w of an electrically conductive material.

77. A process for the preparation of a fabric as defined in any of claims 51-62, which comprises the steps of:

a) liquid printing a first layer of silicone rubber loaded with an amount between 5% w/w to 40% w/w of a electrically conductive material into the fabric;

b) pre-curing the first layer for up one minute at a temperature between 80°C to 200°C;

c) curing the first layer at room temperature.

78. The process according to claim 77, wherein the liquid-printing step comprises applying a pressure comprising from 0.2 to 0.8 Kg/m^2 when printing the silicone rubber loaded with the electrically conductive material directly to the fabric.

79. The process according to claim 77 or 78, wherein the liquid-printing step comprises applying a pressure comprising from 0.3 to 0.5 Kg/m^2 when printing the silicone rubber loaded with the electrically conductive material directly to the fabric.

80. A device comprising:

a) the fabric as defined in any of claims 51-62,

b) an electronic instrument for receiving and collecting and/or storing and/or processing, and/or transmitting data from said fabric.

81. A garment comprising the device of claim 80.

82. A device comprising the sensor as defined in any of claims 51-62, and an electronic instrument for receiving, collecting, storing, processing and/or transmitting data from said sensor.

83. A garment comprising the device of claim 82.

84. A method for monitoring a physiological signal of a user comprising

- receiving, collecting, storing, processing and/or transmitting one or more parameters indicative of at least one physiological signal of a user originating from at least one sensor as defined in any of claims 51-62 incorporated in a garment; and

- evaluating said physiological signal along the time.

85. The method of claim 84, wherein the physiological signal is an ECG signal.

86. A fabric which comprises at least an elastic and electrically conductive track integrated into the fabric, and wherein the elastic and electrically conductive track comprises a silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material, wherein the thickness of the elastic and electrically conductive track comprising from 120 to 800 pm thick, from 120-500 pm thick, from 250-500 pm thick or from 300-400 pm thick.

87. The fabric of claim 86, wherein the electrically conductuctive material is screen printed with a thickness of at least 25 pm, 50 pm, 75 pm, 100 pm, 120 pm, 130 pm, 140 pm, 150 pm, 160 pm, 170 pm, 180 pm, 190 pm, 200 pm, 210 pm, 220 pm, 230 pm, 240 pm, 250 pm, 260 pm, 270 pm, 280 pm, 290 pm, 300 pm, 325 pm, 350 pm, 375 pm, 400 pm, 425 pm, 450 pm, 475 pm, 500 pm, 525 pm, 550 pm, 575 pm, 600 pm, 625 pm, 650 pm, 675 pm, 700 pm, 725 pm, 750 pm, 775 pm, 800 pm, 825 pm, 850 pm, 875 pm, 900 pm, 925 pm, 950 pm, 975 pm, 1000 pm.

88. The fabric of claim 86 or 87, wherein the electrically conductuctive material is screen printed with a thickness of no more than 25 pm, 50 pm, 75 pm, 100 pm, 120 pm, 130 pm, 140 pm, 150 pm, 160 pm, 170 pm, 180 pm, 190 pm, 200 pm, 210 pm, 220 pm, 230 pm, 240 pm, 250 pm, 260 pm, 270 pm, 280 pm, 290 pm, 300 pm, 325 pm, 350 pm, 375 pm, 400 pm, 425 pm, 450 pm, 475 pm, 500 pm, 525 pm, 550 pm, 575 pm, 600 pm, 625 pm, 650 pm, 675 pm, 700 pm, 725 pm, 750 pm, 775 pm, 800 pm, 825 pm, 850 pm, 875 pm, 900 pm, 925 pm, 950 pm, 975 pm, 1000 pm.

89. The fabric of any of claims 86-88, which further comprises a layer of an insulating material covering the track, wherein the insulating material may or may not include an electrically conductive material.

90. The fabric of any of claims 86-89, wherein the fabric comprises an electrode to be placed in contact with the skin of an user and in electrical contact with a flexible and electrically conductive track.

91. The fabric of claim 90, wherein the electrode comprises a conductive fabric made of conductive fibers and non-conductive fibers.

92. The fabric of claim 90 or 91 , wherein the electrode comprises a layer of silicone rubber loaded with an amount between 5% w/w to 40% w/w of an elastic and electrically conductive material, which is integrated into the fabric.

93. The fabric of claim 90, 91 or 92, wherein the electrode comprises a layer of silicone rubber, loaded with an amount comprising at least 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 1 1 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30% w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w, 58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically conductive material.

94. The fabric of any of claims 90-93, wherein the electrode comprises a layer of silicone rubber, loaded with an amount comprising an amount comprising no more than 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 11 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30% w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w, 58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically conductive material.

95. The fabric of any of claims 86-94, wherein the electrical resistance per cm of a flexible material loaded with an electrically conductive material is comprising from 50 Ω/cm to 100 kΩ/cm.

96. The fabric of any of claims 86-96, wherein the electrical resistance per cm of a flexible material, loaded with an electrically conductive material is less than 1 KΩ/cm, less than 2 KΩ/cm, less than 3 KΩ/cm, less than 4 KΩ/cm, less than 5 KΩ/cm, less than 6 KΩ/cm, less than 7 KΩ/cm, less than 8 KΩ/cm, less than 9 KΩ/cm, less than 10 KΩ/cm, less than 1 1 KΩ/cm, less than 12 KΩ/cm, less than 13 KΩ/cm, less than 14 KΩ/cm, less than 15 KΩ/cm, less than 16 KΩ/cm, less than 17 KΩ/cm, less than 18 KΩ/cm, less than 19 KΩ/cm, less than 20 KΩ/cm, less than 21 KΩ/cm, less than 22 KΩ/cm, less than 23 KΩ/cm, less than 24 KΩ/cm, less than 25 KΩ/cm, less than 26 KΩ/cm, less than 27 KΩ/cm, less than 28 KΩ/cm, less than 29 KΩ/cm, less than 30 KΩ/cm, less than 31 KΩ/cm, less than 32 KΩ/cm, less than 33 KΩ/cm, less than 34 KΩ/cm, less than 35 KΩ/cm, less than 36 KΩ/cm, less than 37 KΩ/cm, less than 38 KΩ/cm, less than 39 KΩ/cm, less than 40 KΩ/cm, less than 41 KΩ/cm, less than 42 KΩ/cm, less than 43 KΩ/cm, less than 44 KΩ/cm, less than 45 KΩ/cm, less than 46 KΩ/cm, less than 47 KΩ/cm, less than 48 KΩ/cm, less than 49 KΩ/cm, less than 50 KΩ/cm, 55 KΩ/cm, less than 60 KΩ/cm, less than 65 KΩ/cm, less than 70 KΩ/cm, less than 75 KΩ/cm, less than 80 KΩ/cm, less than 85 KΩ/cm, less than 90 KΩ/cm, less than 95 KΩ/cm, less than 100 KΩ/cm, 150 KΩ/cm, 200 KΩ/cm, 250 KΩ/cm, 300 KΩ/cm, 350 KΩ/cm, 400 KΩ/cm, 450 KΩ/cm, 500 KΩ/cm, 550 KΩ/cm, 600 KΩ/cm, 650 KΩ/cm, 700 KΩ/cm, 750 KΩ/cm, 800 KΩ/cm, 850 KΩ/cm, 900 KΩ/cm, 950 KΩ/cm or 100 KΩ/cm.

97. The fabric according of any of claims 86-96, wherein the cured temperature of the silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material is of from 20°C to 200 °C, of from 50 °C to 140 °C or of from 100 °C to 120 °C.

98. The fabric according of any of claims 86-97, wherein the cured temperature of the silicone rubber and/or fluorosilicone rubber loaded with an electrically conductive material is no more than 5 °C, no more than 10 °C, no more than 15 °C, no more than 20 °C, no more than 25 °C, no more than 30 °C, no more than 35 °C, no more than 40 °C, no more than 45 °C, no more than 50 °C, no more than 55 °C, no more than 60 °C, no more than 65 °C, no more than 70 °C, no more than 75 °C, no more than 80 °C, no more than 85 °C, no more than 90 °C, no more than 95 °C, no more than 100 °C, no more than 110 °C, no more than 120 °C, no more than 130 °C, no more than 140 °C, no more than 150 °C, no more than 160 °C, no more than 165, no more than 170 °C, no more than 180 °C, no more than 190 °C, no more than 200 °C, no more than 210 °C, no more than 220 °C, no more than 230 °C, no more than 240 °C, no more

than 250 °C, no more than 260 °C, no more than 270 °C, no more than 280 °C, no more than 290 °C or no more than 300.

99. The fabric of any of claims 86-98, wherein the silicone rubber and/or fluorosilicoe rubber loaded with an amount comprising from 5% w/w to 40% w/w of a electrically conductive material comprises: a) diorganopolysiloxane gum having silicon-bonded alkenyl groups;

b) organohydrogenpolysiloxanes;

c) a platinum catalyst; and

d) between 5-40 % w/w of an electrically conductive material.

100. The fabric of any of claims 86-99, wherein the electrically conductive material is carbon fibers, carbon black, nickel-coated graphite, copper fibers and mixtures thereof or various metal powders such as silver, nickel, and copper.

101. The fabric of claim 100, wherein the carbon black is furnace black, lamp black, thermal black, acetylene black, channel black.

102. A process for the preparation of a fabric as defined in any of claims 86-101 , which comprises the steps of:

a) liquid printing a first layer of silicone rubber and/or fluorosilicone rubber loaded with an amount between 5% w/w to 40% w/w of an electrically conductive material into the fabric;

b) pre-curing the first layer for up one minute at a temperature between 80°C to 200°C;

c) curing the first layer at room temperature.

103. The process of claim 102, wherein the liquid printing step comprises applying a pressure comprising from 0.2 to 0.8 Kg/m^2, of from 0.3 to 0.5 Kg/m^2; or of from 0.45 Kg/m^{2}when printing the silicone rubber and/or fluorsilicone rubber loaded with the electrically conductive material directly to the fabric.

104. The process of claim 102 or 103, wherein the liquid printing step comprises applying a pressure comprising at least 0.1 Kg/m^2, at least 0.2 Kg/m^2, at least 0.3 Kg/m^2, at least 0.4 Kg/m^2, at least 0.5 Kg/m^2, at least 0.6 Kg/m^2, at least 0.7 Kg/m^2, at least 0.8 Kg/m^2, at least 0.9 Kg/m^2, at least 1 when printing the silicone rubber and/or fluorosilicone rubber loaded with the electrically conductive material directly to the fabric.

105. Use of a silicone rubber and/or fluorosilicone rubber loaded with an amount comprised of from 5% w/w to 40% w/w of an electrically conductive material for the preparation of the fabric of any of claims 86-101.

106. The use of a silicone rubber and/or fluorsilicone rubber of claim 102, wherein the silicone rubber and/or fluorosilicone rubber is comprising no more than 1 % w/w, 2 % w/w, 3% w/w, 4% w/w, 5% w/w, 6% w/w, 7% w/w, 8% w/w, 9 % w/w, 10% w/w, 11 % w/w, 12% w/w, 13% w/w, 14% w/w, 15% w/w, 16% w/w, 17% w/w, 18% w/w, 19% w/w, 20% w/w, 21 % w/w, 22% w/w, 23% w/w, 24 % w/w, 26% w/w, 27% w/w, 28% w/w, 29% w/w, 30% w/w, 31 % w/w, 32% w/w, 33% w/w, 34 % w/w, 35% w/w, 36 % w/w, 37% w/w, 38% w/w, 39% w/w, 40% w/w, 41 % w/w, 42% w/w, 43% w/w, 44% w/w, 45% w/w, 46% w/w, 47% w/w, 48% w/w, 49% w/w, 50% w/w, 51 % w/w, 52% w/w, 53% w/w, 54% w/w, 55% w/w, 56 % w/w, 57% w/w,

58% w/w, 59% w/w, 60% w/w, 65% w/w, 70% w/w, 75% w/w, 80% w/w, 85% w/w, 90% w/w, 95% w/w or more of an electrically conductive material.

107. A device comprising:

a) the fabric as defined in any of claims 86-101 ,

b) an electronic instrument for receiving and collecting and/or storing and/or processing, and/or transmitting data from said fabric.

108. A garment comprising a device of claim 107.