CLAIMS

[CLAIM1]

Non-invasive pulsatile circulatory assistance device facilitating the circulation of a volume of blood in a subject's body, wherein the device comprises:

- a flexible multilayer structure for applying against at least a portion of said subject's body, said structure comprising a flexible inner layer beside said subject's body and a more rigid outer layer; and
- means for pulsating connected to said multilayer structure in such a manner that the assembly comprising the structure plus the pulsation means is leaktight, and creating pulsation waves between said inner and outer layers by means of a fluid referred to as a "pulsation" fluid;

said multilayer structure including means for guiding each of said pulsations progressively in the venous return direction towards the inside of said subject’s body along said portion of said subject's body when said structure is placed on said portion of said subject's body, and

wherein the multilayer structure includes an admission opening for admitting a pulsation fluid coming from the means for pulsating between the inner and outer layers, and wherein the means for guiding the pulsations, comprise a gelatinous and/or granular fluid between said outer and inner layers, performing a progressive propagation of each of the pulsations in the venous return direction along said structure.

[CLAIM2]

Device according to claim 1, characterized in that it further comprises means for determining a pulsation frequency as a function of:

- data relating to heart rate;
- data relating to breathing rate;
- data relating to the subject's state of health; and/or
- data relating to the body portion on which said multilayer structure is applied.

[CLAIM3]
Device according to any one of the preceding claims, characterized in that the inner layer (102) comprises, on at least one portion thereof, a cavity (110) between a microporous wall (108) for putting into contact with the subject's skin and a wall beside the outer layer, said cavity (110) being arranged to receive and/or convey a substance for application to said subject's skin through said microporous wall (108).

[CLAIM4]
Device according to claim 3, characterized in that it comprises an opening (112) for filling the cavity (110) with a substance, said opening (112) being closed in leaktight manner by means for closing in use.

[CLAIM5]
Device according to any one of the preceding claims, characterized in that the gelatinous fluid is contained in an intermediate layer (106) between the outer layer (104) and the inner layer (102).

[CLAIM6]
Device according to any one of the preceding claims, characterized in that the pulsation means (200, 300) comprise:

- a pneumatic reservoir (202);
- means for compressing (300) said pneumatic reservoir (202) in rhythmic manner; and
- a leaktight connector (204) connecting said pneumatic reservoir (202) to the flexible multilayer structure (100).

[CLAIM7]
Device according to any one of claims 1 to 5, characterized in that the pulsation means comprise:

- a pneumatic reservoir (202); and

- a leaktight connector (204) connecting said pneumatic reservoir (202) to the flexible multilayer structure (100); the assembly comprising the reservoir (202), the connector (204), and the structure (100) constituting a closed circuit for the pulsation fluid; and

said pneumatic reservoir (202) being arranged in such a manner as to be compressed and decompressed by a force exerted by said subject.

[CLAIM8]
Device according to claim 7, characterized in that the reservoir, the connector, and the flexible multilayer structure (100) constitute a one-piece unit.

[CLAIM9]
Device according to any one of the preceding claims, characterized in that the flexible multilayer structure (100) comprises a hood (500) for placing over at least a portion of the subject's face.

[CLAIM10]
Device according to any one of the preceding claims, characterized in that the flexible multilayer structure comprises a pair of trousers (600).

[CLAIM11]
Device according to any one of the preceding claims, characterized in that the flexible multilayer structure comprises a jacket.

[CLAIM12]
Device according to any one of the preceding claims, characterized in that the flexible multilayer structure comprises a glove.

[CLAIM13]

Device according to any one of the preceding claims, characterized in that the flexible multilayer structure comprises a boot or a sock.

[CLAIM14]
Non-invasive pulsatile circulatory assistance assembly (600) covering a plurality of portions of a subject's body, said assembly comprising at least one device according to any preceding claim for each of said portions

[CLAIM15]
Non-invasive pulsatile circulatory assistance assembly covering a plurality of portions of a subject's body, said assembly being characterized in that it comprises:

- for each of said portions, a flexible multilayer structure for application on said portion of said subject's body, said structure comprising a flexible inner layer beside said subject's body and a more rigid outer layer; and
- means for pulsating common to said pulsatile structures, said pulsations means being connected in leaktight manner to each of said multilayer structures, and creating pulsations between said inner and outer layers of each of said structures by means of a fluid referred to as a "pulsation" fluid;

each of said structures including means for guiding each of said pulsations progressively in the venous return direction towards the inside of said subject's body along said portion of said subject's body when said structure (100) is placed on said portion of said subject's body, and

wherein the multilayer structure includes an admission opening for admitting a pulsation fluid coming from the means for pulsating between the inner and outer layers, and wherein the means for guiding the pulsations, comprise a gelatinous and/or granular fluid between said outer and inner layers, performing a progressive propagation of each of the pulsations in the venous return direction along said structure.