Claims

1. An implantable electrode comprising:

a sheath extending along a longitudinal axis of the electrode, the sheath being made of an electrically insulating material; and

at least one connection cable, wherein the connection cable is at least partly embedded in the sheath and the sheath has a hollow cylindrical shape,

wherein the hollow cylindrical shape of the sheath has an inner side and an outer side,

wherein the electrode has at least one contact element, wherein the at least one contact element has a feedthrough passing through the sheath and forming an electrically conductive connection with the at least one connection cable,

wherein the at least one contact element sits on the outer side of the sheath,

wherein the at least one connection cable is arranged between two electrically insulating thermoplastic polymer films which are permanently connected with one another,

wherein a first of the two films is planar and has the at least one connection cable formed on one of its sides and the at least one contact element formed on a side of the first film opposite the at least one connection cable

wherein a second of the two films is planar and is connected to the first film on the one side of the first film where the at least one connection cable is formed

wherein the first and second films forming the sheath are wrapped in the form of the hollow cylindrical shape, and

wherein to connect the at least one connection cable and the at least one contact element together the feedthrough is provided with a metalized opening in the one film connecting the two sides of the one film with one another.

2. The implantable electrode according to claim 1, wherein the at least one contact element extends at least partly around the longitudinal axis.

3. The implantable electrode according to claim 2, wherein the electrode has multiple contact elements.

4. The implantable electrode according to claim 3, wherein the contact elements are arranged spaced apart from one another along the longitudinal axis.

5. The implantable electrode according to claim 1, wherein the electrode has multiple connection cables that are at least partly embedded in the sheath and that are arranged spaced apart from one another in the peripheral direction of the electrode extending around the longitudinal axis.

6. The implantable electrode according to claim 1, wherein the electrode has a core against which the sheath lies.

7. The implantable electrode according to claim 6, wherein the sheath is connected with the core by material bonding.

8. The implantable electrode according to claim 6, wherein the core is made with a lumen extending continuously through the core along the longitudinal axis.