Claims

1. Process for producing an electrode structure, comprising the steps of:

a. Producing a longitudinal body ~~(7)~~ having a core ~~(8)~~ and at least one layer ~~(9)~~ made of an electrode material surrounding the core ~~(8)~~, wherein the layer made of electrode material is applied mechanically to the core as a solid material;

b. Removing a part of the layer ~~(9)~~ made of electrode material while forming a plurality of electrodes ~~(2)~~ that are arranged such as to be distributed in the longitudinal direction and which are separated from each other, and contact paths ~~(3)~~ that extend in the longitudinal direction and adjoin the electrodes, each, as the same part;

c. Applying a layer ~~(4)~~ made of a polymeric material while embedding, at least in part, the electrodes and/or contact paths ~~(2, 3)~~ formed in step b.

2. Process according to claim 1, ~~characterised in that~~wherein the core ~~(8)~~ is removed after step c and in that the resulting hollow space is filled, at least partly, with a material while forming a new core ~~(6)~~.

3. Process according to claim 2, ~~characterised in that~~wherein the core ~~(8)~~ consists of a metal.

4. Process according to claim 1, ~~characterised in that~~wherein the core ~~(8)~~ is not removed after step c.

5. Process according to any one of the preceding claims, ~~characterised in that~~wherein step b is implemented by erosive removal of the electrode material ~~(9)~~.

6. Process according to claim 5, ~~characterised in that~~wherein the erosive removal proceeds by means of a laser or spark erosion.

7. Process according to claim 6, ~~characterised in that~~wherein the removal proceeds by means of an ultra-short pulse laser.

8. Process according to any one of the preceding claims, ~~characterised in that~~wherein step b is implemented by means of a photochemical process.

9. Process according to claim 8, ~~characterised in that~~wherein the layer situated on the electrode material is illuminated by a laser.

10. Process according to any one of the preceding claims, ~~characterised in that~~wherein step c proceeds by extrusion of the polymeric material, by printing the material, by application to the entire surface from liquid phase or by deposition from the gas phase.

11. Process according to any one of the preceding claims, characterised by the the step of:
selective removal of the layer applied in step c., at least in regions of the electrodes ~~(2)~~.

12. Process according to any one of the preceding claims, comprising the step of:
bending the longitudinal body ~~(7)~~ about the longitudinal direction into a shape.

13. Process according to any one of the preceding claims, ~~characterised in that~~wherein the layer ~~(9)~~ made of electrode material is surrounded by a second layer made of an electrode material, whereby the layers made of electrode material are separated by an insulating layer.

14. Process according to any one of the preceding claims, ~~characterised in that~~wherein the longitudinal body ~~(7)~~ tapers at least over a section in the longitudinal direction.

15. Process according to any one of the preceding claims, ~~characterised in that~~wherein the electrode structure is provided as cochlear electrode for arrangement in an inner ear.

16. Process according to any one of the claims 1 to 12, ~~characterised in that~~wherein at least some of the electrodes ~~(2)~~ are provided as part of a sensor.

17. Electrode structure, comprising
a longitudinal body ~~(7)~~ having a non-conductive layer ~~(4)~~ that has a hollow shape, and
a plurality of electrodes ~~(2)~~ that are embedded in the layer such as to be insulated from each other, and

a plurality contact paths ~~(3)~~ that extend in the longitudinal direction and are insulated with respect to the outside by the layer, and are each connected, being a single part, to one of the electrodes ~~(2)~~,

~~characterised in that~~wherein

the non-conductive layer ~~(4)~~ is formed to be seamless in circumferential direction, and wherein the plurality of electrodes and plurality of contact paths are made of a solid material.

18. Electrode structure ~~(17)~~ produced according to a process according to any one of the claims 1 to 16.

19. Electrode structure according to claim 17 or 18, ~~characterised in that~~wherein the electrodes ~~(2)~~ each comprise a surface beyond which the surface of the layer ~~(4)~~ made of polymeric material protrudes.

20. Electrode structure according to claim 19, ~~characterised in that~~wherein an edge section of the electrodes ~~(2)~~ is framed by the layer ~~(4)~~.