

CLAIMS

1. A device for a medical treatment of a sclera, the device comprising a curved disc-~~or belt~~, wherein:

5 the disc/~~belt~~ is configured to be placed into the Tenon's space;

the disc/~~belt~~ is formed such that the inner surface of the curved disc is superficially contactable to the surface of an area of the sclera so as to superficially cover said area; and

10 the disc/~~belt~~ comprises ~~one~~, two, three, four, or more independent channel systems, wherein at least part of the channel systems are configured as agent channel systems such that the channels of each of the agent channel systems are tubes adapted to lead an agent from a proximal end of the tube to a distal opening, and wherein at least part of the channel systems are configured as optical guiding systems, wherein each of the optical guiding systems is adapted to guide electromagnetic waves from the proximal end of the first channel to the distal openings of the optical guiding system.

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2. The device of claim 1, wherein the disc has the form of an elongate bowl, for example an ellipsoidal cap or a spherical cap-~~or a belt~~, having preferably a length between 10 mm and 30 mm, more preferably a length between 15 mm and 25 mm, or most preferably a length of 20 mm, and having preferably a width between 5 mm and 25 mm, more preferably between 20 8 mm and 20 mm, or most preferably between 10 mm and 15 mm, and wherein the thickness of the disc is lower than or equal to 5 mm, or preferably lower than or equal to 3 mm, and has preferably a minimum of 2mm.

3. The device of claim 1 or 2, wherein one or more recesses are formed in the edge of the disc, wherein preferably the one or more recesses are positioned and formed such that the 25 recesses leave free space for eye muscles, blood vessels and/or nerves when the disc is positioned on said area of the sclera.

4. The device of any one of claims 1 to 3, wherein (i) the disc comprises a base layer 30 made from a material preferably being sterilisable and/or heat-resistant, for example medical steel, and is preferably impervious to light, and/or (ii) the outer surface of the disc and/or the edge of the disc is impervious to light.

5. The device of claim 4, wherein the disc comprises one or more additional layers, wherein the base layer and the one or more additional layers are arranged as stacked layers with the base layer on the outer side of the disc so as to support the additional layers, and
5 wherein each of the one or more additional layers is preferably made from a plastic or a metal material, more preferably light-diffusing, light blocking and/or sponge like material.

6. The device of any one of claims 1 to 5, wherein each of the channel systems comprises a first channel having a proximal end on the edge of the disc or extending beyond the edge of
10 the disc, wherein the first channel at the distal end either splits into two or more second channels or has a distal opening, wherein each of the second channels at the distal end again either can split into two or more third channels or has a distal opening, and wherein the splitting of the channels can be further repeated such that each of the channels either splits into two or more channels or has a distal opening.

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7. The device of claim 6, wherein at least part of the distal openings being arranged on a surface of a layer are formed as elongate openings, wherein, for example, an elongate opening may be formed such that part of the channel having the elongate opening is shaped as a half-cylinder with its round side being embedded in the respective layer and being open in the
20 direction pointing away from the respective layer.

8. The device of any one of claims 1 to 7, wherein the distal openings of at least a part of the channel systems are regularly, irregularly or distinct distributed with respect to the plane of the disc, wherein the plane of the disc can be virtually subdivided into different areas
25 having different distributions of the openings.

9. The device of any one of claims 1 to 8, wherein the density of the distal openings of at least a part of the channel systems is variable with respect to the plane of the disc.

30 10. The device of any one of claims 1 to 9, wherein the disc has a symmetric shape, and the distal openings of at least a part of the channel systems are preferably arranged symmetrically in accordance with the symmetry of the disc.

11. The device of any one of claims 6 to 10, wherein:

the channels systems are embedded in the base layer, wherein each of the openings at a distal end of a channel is arranged on the inner surface of the base layer; or,

5 as far as this claim is dependent on claim 5, the channel systems are at least partly embedded in the base layer and/or at least partly embedded in one or more of the additional layers, wherein each of the openings at a distal end of a channel is arranged on the inner surface of the base layer or within one of the additional layers or on the surface of one of the additional layers.

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~~12. The device of any one of claims 1 to 11, wherein at least part of the channel systems are configured as agent channel systems such that the channels of each of the agent channel systems are tubes adapted to lead an agent, and wherein, preferably, the proximal end of the first channel of each of the agent channel systems is connectable to a separate agent supply.~~

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12~~13~~. The device of any one of claims 1 to 11~~12~~, wherein the channels of at least part of the agent channel systems are at least partly isolated against electromagnetic radiation, preferably isolated against electromagnetic radiation with a wavelength in the range between 100 nm and 2000 nm, and most preferably isolated against electromagnetic radiation with a wavelength in

20 the range between 300 nm and 800 nm.

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13~~14~~. The device of any one of claims 1~~12~~ or 12~~13~~, wherein the inner surface of the disc has a structure adapted to allow for an improved distribution of agent when agent is lead through the agent channel system(s), and wherein the surface structure can comprise chamfers, or

25 elements such as bars, half-spheres, pyramids or cones.

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14~~15~~. The device of any one of claims 1~~12~~ to 13~~14~~, wherein one of the additional layers can be made of a sponge or a sponge-like material or a porous material preferably being sterilisable and/or heat-resistant, and wherein at least part of the distal openings of at least part

30 of the agent channel systems are arranged within or at the outer side of the layer(s) made from a sponge or a sponge-like material or a porous material.

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~~16. The device of any one of claims 1 to 11, wherein at least part of the channel systems are configured as optical guiding systems, wherein each of the optical guiding systems is adapted to guide electromagnetic waves from the proximal end of the first channel to the distal openings of the optical guiding system.~~

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~~15~~17. The device of any one of claims 1 to 14~~16~~, wherein the channels of the optical guiding system(s) comprise one or more bundles of optical conductors, for example optical fibres, and wherein at each split of a channel, the bundle comprised in the channel is fanned out into a number of smaller bundles, the number of smaller bundles corresponding to the number of the

10 two or more subsequent channels, such that each of the two or more subsequent channels comprises one of the smaller bundles.

~~16~~18. The device of any one of claims 14 to 15~~or 17~~, wherein at least one of the additional layers is a diffuser adapted for diffusing electromagnetic waves, and wherein at least part of

15 the distal openings of at least part of the optical guiding systems are arranged within or at the outer side of the additional layer(s) being a diffuser.

~~17~~19. The device of any of claims 14 to 16~~18~~, wherein the device comprises two, three, four, or more independent optical guiding systems, and wherein each of the optical guiding

20 subsystems is adapted for guiding a certain range of electromagnetic radiation, and, preferably, wherein the proximal end of the first channel of each of the optical guiding systems is connectable to a source of electromagnetic radiation, preferably such that each of the optical guiding systems can be supplied independently with electromagnetic radiation.

25 ~~18~~20. The device of any one of claims 1 to 10, wherein at least one of the channel systems is configured as a cleaning system such that the channels of the cleaning system(s) are tubes adapted to lead an agent, and wherein preferably the distal openings of each of the cleaning system(s) are arranged on the outer surface of the disc and/or on the edge of the disc.

30 ~~19~~21. The device of claim ~~20~~18, wherein:

at least one of the cleaning system(s) is configured as a suction system, wherein the proximal end of the first channel of each of the suction system(s) is connectable to a pump

means, and wherein preferably at least one cleaning system is configured as a flushing system configured to deliver one or more agents to the distal openings, wherein the suction system(s) and the flushing system(s) are identical cleaning system(s) adapted for suction and flushing in an alternative manner, or

- 5 wherein at least one cleaning system is configured as suction system and at least one further cleaning system is configured as flushing system.

10 ~~2022.~~ The device of any one of claims 1 to ~~21~~19, wherein (i) a handle is arranged at the edge of the disc, and, as far as dependent on claim 6, wherein preferably the handle is arranged as a tube and the first channel of each of the channel systems extends through the handle, and/or (ii) wherein a handle is connectable with the edge of the disc, and, as far as dependent on claim 6, wherein preferably the handle is arranged as a tube and the first channel of each of the channel systems can be conducted through the handle.

15 ~~2123.~~ The device of any one of the preceding claims, further comprising one or more sensor(s) or measurement system(s), such as a temperature sensor and/or a camera system and/or biomechanical sensor, preferably a pressure sensor, and/or a pH meter.

20 ~~24.—A method of treating the sclera in a subject comprising the steps of~~
 (i) ~~placing of the disc/belt of the device of any of claims 1 to 23 into the Tenon's space in the eye of the subject so that the inner surface curved disc/belt is superficially in contact with a surface of an area of the sclera,~~
 (ii) ~~applying an agent and/or electromagnetic radiation to the sclera of the subject.~~

25 ~~25.—A method of treating a pathological change or disease of the eye, comprising the steps of~~
 of
 (i) ~~placing of the disc/belt of the device of any of claims 1 to 23 into the Tenon's space in the eye of the subject so that the inner surface curved disc/belt is superficially in contact with a surface of an area of the sclera,~~

30 (ii) ~~applying an agent and/or electromagnetic radiation to the sclera of the subject.~~