

Claims

1. Gripper (1) for a contact lens (L) comprising a gripper head (2) having a bearing surface (21) for the contact lens (L) to adhere thereto, and further comprising an ejector (23, 24) for mechanically displacing the contact lens (L), at least partially, away from the bearing surface (21).
2. Gripper according to claim 1, wherein the ejector comprises a plurality of ejector pins (23), the ejector being actuatable such that the ejector pins (23) are movable from a rest position in which the ejector pins (23) do not interfere with the bearing surface (21), to an ejection position in which the ejector pins (23) axially protrude beyond the bearing surface (21), and vice versa.
3. Gripper according to claim 2, wherein in the rest position the ejector pins (23) are arranged in the interior of the gripper and wherein the bearing surface (21) comprises a plurality of guide openings (223) through which the ejector pins (23) protrude axially beyond the bearing surface (21) when the ejector pins (23) are in the ejection position.
4. Gripper according to any one of claims 1 to 3, wherein the bearing surface (21) comprises a plurality of suction openings (22) through which underpressure can be applied from the interior of the gripper (1) in order to suck the contact lens (L) against the bearing surface (21).
5. Gripper according to either of claim 3 or 4, wherein the guide openings (223), at least partially, form a part of the plurality of suction openings (22) in the bearing surface.

6. Gripper according to any one of the preceding claims, wherein the ejector (23, 24) is mechanically, pneumatically, or hydraulically actuatable.
7. Gripper according to any one of claims 2 to 6, wherein the plurality of ejector pins (23) are mounted on a common plunger (24) which is arranged axially displaceable in the interior of the gripper (1).
8. Gripper according to any one of claims 2 to 7, wherein in the ejection position the plurality of ejection pins (23) axially protrude beyond the bearing surface (21) for a distance of 1 mm to 10 mm, in particular for a distance of 1 mm to 5 mm.
9. Gripper according to any one of the preceding claims, wherein the bearing surface (21) further comprises a detection opening (222) through which a test-underpressure may be applied.
10. Gripper according to claim 9, further comprising a detection tube (12) being arranged in the interior of the gripper (1), with a distal end (120) of the detection tube (12) being connected with the detection opening (22) in a fluid-tight manner so as to allow application of the test-underpressure through the detection opening (22).
11. Gripper according to any one of claims 4 to 10, further comprising a vacuum tube (14) extending through the interior of the gripper (1), a distal end (140) of the vacuum tube (14) being arranged in the interior of the gripper and at a short distance (s) from the plurality of suction openings (22) in the bearing surface (21) through which the underpressure can be applied for sucking the contact lens (L) against the bearing surface (21).
12. Gripper according to claim 11, further comprising a leakage stream channel (31) being connected with an inlet (443) for a leakage stream, the leakage stream

channel (31) being in fluid connection with the plurality of suction openings (22) in the bearing surface and with the distal end (140) of the vacuum tube (14).

13. Gripper according to any one of the preceding claims, wherein the bearing surface (21) is a convexly curved smooth surface.
14. Gripper according to any one of the preceding claims, wherein the bearing surface (21) has an outer diameter (d) which is larger than that of a contact lens (L) to be sucked against the bearing surface (21).
15. Process for transporting a contact lens (L) from a start location to a destination location, the process comprising the steps of:
 - providing a gripper (1) according to any one of the preceding claims,
 - positioning the gripper head (2) of the gripper at the start location with its bearing surface (21) adjacent to the contact lens (L) at a distance sufficiently close to the contact lens (L) to cause the contact lens to adhere to the bearing surface (21),
 - moving the gripper (1) together with the contact lens (L) adhered to the bearing surface (21) to the destination location, and
 - actuating the ejector (23, 24) in order to mechanically displace the contact lens (L) at least partially from the bearing surface (21) until the contact lens comes into sufficient contact with a receiving liquid at the destination location in order to release the contact lens (L) from the gripper (1).

Claims

1. A gripper (1) for a contact lens (L) comprising a gripper head (2) having a bearing surface (21) for the contact lens (L) to adhere thereto, and further comprising an ejector (23, 24) for mechanically displacing the contact lens (L), at least partially, away from the bearing surface (21); and wherein the ejector comprises a plurality of ejector pins (23), the ejector being actuatable such that the ejector pins (23) are movable from a rest position in which the ejector pins (23) do not interfere with the bearing surface (21), to an ejection position in which the ejector pins (23) axially protrude beyond the bearing surface (21), and vice versa.
2. The gripper according to claim 1, wherein in the rest position the ejector pins (23) are arranged in the interior of the gripper, and wherein the bearing surface (21) comprises a plurality of guide openings (223) through which the ejector pins (23) protrude axially beyond the bearing surface (21) when the ejector pins (23) are in the ejection position.
3. The gripper according to claim 2, wherein the guide openings (223), at least partially, form a part of the plurality of suction openings (22) in the bearing surface.
4. The gripper according to claim 2, wherein the ejector (23, 24) is mechanically, pneumatically, or hydraulically actuatable.
5. The gripper according to claim 1, wherein the bearing surface (21) comprises a plurality of suction openings (22) through which underpressure can be applied from the interior of the gripper (1) in order to suck the contact lens (L) against the bearing surface (21).
6. The gripper according to claim 5, wherein the bearing surface (21) further comprises a detection opening (222) through which a test-underpressure may be applied.
7. The gripper according to claim 6, further comprising a detection tube (12) being arranged in the interior of the gripper (1), with a distal end (120) of the detection tube (12) being connected with the detection opening (22) in a fluid-tight manner so as to allow application of the test-underpressure through the detection opening (22).
8. The gripper according to claim 5, further comprising a vacuum tube (14) extending through the interior of the gripper (1), a distal end (140) of the vacuum tube (14) being arranged in the interior of the gripper and at a short distance (s) from the plurality of suction openings (22) in the bearing surface (21) through which the underpressure can be applied for sucking the contact lens (L) against the bearing surface (21).
9. The gripper according to claim 8, further comprising a leakage stream channel (31) being connected with an inlet (443) for a leakage stream, the leakage stream channel (31) being in fluid connection with the plurality of suction openings (22) in the bearing surface and with the distal end (140) of the vacuum tube (14).
10. The gripper according to claim 1, wherein the ejector (23, 24) is mechanically, pneumatically, or hydraulically actuatable.

11. The gripper according to claim 1, wherein the plurality of ejector pins (23) are mounted on a common plunger (24) which is arranged axially displaceable in the interior of the gripper (1).
12. The gripper according to claim 1, wherein in the ejection position the plurality of ejection pins (23) axially protrude beyond the bearing surface (21) for a distance of 1 mm to 10 mm, in particular for a distance of 1 mm to 5 mm.
13. The gripper according to claim 1, wherein the bearing surface (21) is a convexly curved smooth surface.
14. The gripper according to claim 1, wherein the bearing surface (21) has an outer diameter (d) which is larger than that of a contact lens (L) to be sucked against the bearing surface (21).
15. A process for transporting a contact lens (L) from a start location to a destination location, the process comprising the steps of: providing a gripper (1) according to claim 1, positioning the gripper head (2) of the gripper at the start location with its bearing surface (21) adjacent to the contact lens (L) at a distance sufficiently close to the contact lens (L) to cause the contact lens to adhere to the bearing surface (21), moving the gripper (1) together with the contact lens (L) adhered to the bearing surface (21) to the destination location, and actuating the ejector (23, 24) in order to mechanically displace the contact lens (L) at least partially from the bearing surface (21) until the contact lens comes into sufficient contact with a receiving liquid at the destination location in order to release the contact lens (L) from the gripper (1).