

CLAIMS

1. An intravascular blood pump (1) for percutaneous insertion into a patient's blood vessel, comprising:
- 5 a pump casing (2) having a blood flow inlet (21) and a blood flow outlet (22), an impeller (3) arranged in said pump casing (2) so as to be rotatable about an axis of rotation (10), the impeller (3) having blades (31) sized and shaped for conveying blood from the blood flow inlet (21) to the blood flow outlet (22),
- a drive unit (4) for rotating the impeller (3), the drive unit (4) comprising a
- 10 plurality of posts (40) arranged about the axis of rotation (10), wherein each of the posts (40) has an impeller-side end (420) pointing towards the impeller (3) with a front surface facing (42) the impeller (3), and
- a coil winding (44) disposed around each of the posts (40) so as to create magnetic field lines (500) running through the front surface (42) of each of the posts (40) and
- 15 controllable so as to create a rotating magnetic field,
- wherein the impeller (3) comprises a magnetic structure (32) arranged to interact with the rotating magnetic field so as to cause rotation of the impeller (3), and
- wherein the front surface (42) of at least one of the posts (40) comprises a concavity in which the front surface (42) is inclined downwards towards a central area
- 20 of the front surface (42) so as to concentrate at least a part of the magnetic field lines (500) running through front surface (42).
2. Intravascular blood pump (1) according to claim 1, wherein the concavity extends up to a circumference of the front surface (42).
- 25 3. Intravascular blood pump (1) according to claim 2, wherein the concavity extends up to the circumference of the front surface (42) on at least two or exactly two opposite sides of the front surface closest to neighboring ones of the plurality of posts (40).
- 30 4. Intravascular blood pump (1) according to claim 2 or 3, wherein a circumference of the concavity coincides with the circumference of the front surface (42).

5. Intravascular blood pump (1) according to any one of claims 1 to 4, wherein the concavity has a flat bottom (42b).
6. Intravascular blood pump (1) according to claim 5, wherein the concavity has a
5 straight-lined inclined side wall (42a) when viewed in a cross-sectional plane running vertically through the front surface (42).
7. Intravascular blood pump (1) according to claim 5, wherein the concavity has a
10 curved inclined side wall (42a) when viewed in a cross-sectional plane running vertically through the front surface (42).
8. Intravascular blood pump (1) according to any one of claims 1 to 4, wherein the
concavity has a curved cross section with a curved bottom when viewed in a cross-
sectional plane running vertically through the front surface (42).
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9. Intravascular blood pump (1) according to any one of claims 1 to 4, wherein the
concavity has a triangular cross section when viewed in a cross-sectional plane running
vertically through the front surface (42).
- 20 10. Intravascular blood pump (1) according to any one of claims 1 to 9, wherein, in the concavity, the front surface (42) is inclined downwards in a radially outer direction relative to the axis of rotation (10) such that a radial inner region of the front surface (42) in the concavity protrudes axially beyond a radial outer region of the front surface (42) in the concavity.
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11. Intravascular blood pump (1) according to any one of claims 1 to 10, wherein the concavity is open towards a side surface of said at least one of the posts (40), wherein the side surface is located radially outward relative to the axis of rotation (10).
- 30 12. Intravascular blood pump (1) according to claim 11, wherein said at least one of the posts (40) has a triangular cross section with three side surfaces, wherein one of the three side surfaces is located radially outward relative to the axis of rotation (10) as

compared to the other two of the three side surfaces and wherein the concavity is open towards the one of the three side surface.

13. Intravascular blood pump (1) according to any one of claims 1 to 12, wherein the
5 concavity has a maximum depth of between 0.05 mm and 0.3 mm.

14. Intravascular blood pump (1) according to any one of claims 1 to 13, wherein the
at least one of the posts (40) has a longitudinal axis (LA) and does not extend with its
impeller-side end (420) radially beyond an impeller-side end (424) of the coil winding
10 (44) disposed around the at least one of the posts (40), wherein the term radially relates
to a direction traverse, preferably perpendicular, to the longitudinal axis (LA).

15. Intravascular blood pump (1) according to any one of claims 1 to 14, wherein at
least one of the posts comprises or consists of a discontinuous soft magnetic material
15 which is discontinuous regarding electrical conductivity in a cross section transverse to
a longitudinal axis (LA) of the respective post (40).

16. Intravascular blood pump (1) according to claim 15, wherein at least one weld
(82, 83, 86) is provided at a surface (811) of the discontinuous soft magnetic material,
20 the weld (82, 83, 86) bridging at least one discontinuity regarding electrical
conductivity in the discontinuous soft magnetic material.

17. Intravascular blood pump (1) according to any of claims 1 to 16, wherein each of
the posts (40) has a rear end (450), wherein the drive unit (4) comprises a back plate
25 (50) connecting the rear ends (450) of the posts (40) and extending between the posts
(40) in an intermediate area (59), wherein a material of at least one of the posts (40) is
integral with a material of the intermediate area (59) of the back plate (50).

18. Intravascular blood pump (1) according to any one of claims 1 to 16, wherein
30 each of the posts (40) has a rear end (450), wherein the drive unit (4) comprises a back
plate (50) connecting the rear ends (450) of the posts (40), wherein at least one of the

rear ends (445) of the posts (40) has a rear end surface (45) contacting the back plate (50).