

CLAIMS

1. A vacuum pump comprising:
a rotor rotatably mounted within a stator;
5 said rotor comprising a plurality of angled blades arranged along a helical path from an inlet to an outlet;
said stator comprising a plurality of perforated elements forming a plurality of perforated discs arranged to intersect said helical path at different axial positions, said perforations allowing gas molecules travelling along said helical
10 path to pass through said perforated elements; wherein
each of said perforated discs comprises an outer curved wall forming an outer circumference of said disc and an inner curved wall forming a portion of an inner circumference of said disc, said inner circumference comprising at least one gap where there is no inner wall.
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2. A vacuum pump according to claim 1, wherein each of said perforated discs comprises at least two perforated elements, said inner circumference comprising at least two gaps, said two gaps in said inner circumference being between adjacent perforated elements forming said perforated disc.
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3. A vacuum pump according to claim 1, wherein said perforated elements are configured to be mounted such that there is substantially no gap between adjacent outer curved walls.
- 25 4. A vacuum pump according to any preceding claim, wherein said perforated elements further comprise side walls extending between said inner curved wall and said outer curved wall at either end of said perforated elements.
5. A vacuum pump according to any preceding claim, wherein said
30 perforated elements further comprise a plurality of partitions extending from said outer curved wall to said inner curved wall, perforations being formed between said plurality of partitions.

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6. A vacuum pump according to any preceding claim, wherein said inner curved wall of each of said plurality of perforated elements comprises at least one indent extending from said inner curved wall towards said outer curved wall, said
5 at least one indent comprising said one of said at least one gap in said inner circumference.

7. A vacuum pump according to claim 6, wherein said indent extends substantially to said outer curved wall.

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8. A vacuum pump according to claim 6 or 7 when dependent on claim 5, wherein said a width of a wall surrounding said indent and a width of said inner and said outer curved walls are substantially wider than a width of said partitions.

15 9. A vacuum pump according to any one of claims 6 to 8, wherein said walls of said at least one indent are angled such that when rotating a radius of said rotor crosses a radially outer portion of said wall before said a radially inner portion of said wall.

20 10. A vacuum pump according to claim 4, or any one of claims 5 to 9 when dependent on claim 4, wherein said side wall of said perforated element that said rotor crosses first when rotating is angled such that said radius of said rotor crosses a radially outer portion of said side wall before said rotor crosses a radially inner portion of said wall.

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11. A vacuum pump according to claim 4, or any one of claims 5 to 9 when dependent on claim 4, wherein said side wall of said perforated element that said rotor crosses last when rotating comprises a protrusion extending therefrom, said protrusion extending circumferentially beyond said side wall.

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12. A vacuum pump according to any preceding claim, said stator further comprising a cylindrical inner surface formed by a stack of rings each having a cylindrical inner surface, said plurality of perforated elements being mounted on respective rings, such that said plurality of perforated elements form a plurality of
5 perforated discs intersecting said helical path at different axial positions.

13. A vacuum pump according to any preceding claim, wherein said perforated elements are formed of aluminium.

10 14. A vacuum pump according to any preceding claim, wherein said rotor is formed of stainless steel.

15 15. A vacuum pump according to any preceding claim, wherein said perforated elements located towards an inlet of said vacuum pump comprise a transparency of more than 50% and said perforated elements located towards an outlet of said vacuum pump comprise a transparency of more than 40%.