

Technical Disclosure Commons

Defensive Publications Series

August 2022

SIMPLY CONSTRUCTED, ROBUST, NOVEL COMBINED (FLOODED AND SPRAYED) COOLING SYSTEM OF AN E-MACHINE

Axel Unger
Bertrandt Ingenieurbüro GmbH

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Recommended Citation

Unger, Axel, "SIMPLY CONSTRUCTED, ROBUST, NOVEL COMBINED (FLOODED AND SPRAYED) COOLING SYSTEM OF AN E-MACHINE", Technical Disclosure Commons, (August 24, 2022)
https://www.tdcommons.org/dpubs_series/5328



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

SIMPLY CONSTRUCTED, ROBUST, NOVEL COMBINED (FLOODED AND SPRAYED) COOLING SYSTEM OF AN E-MACHINE

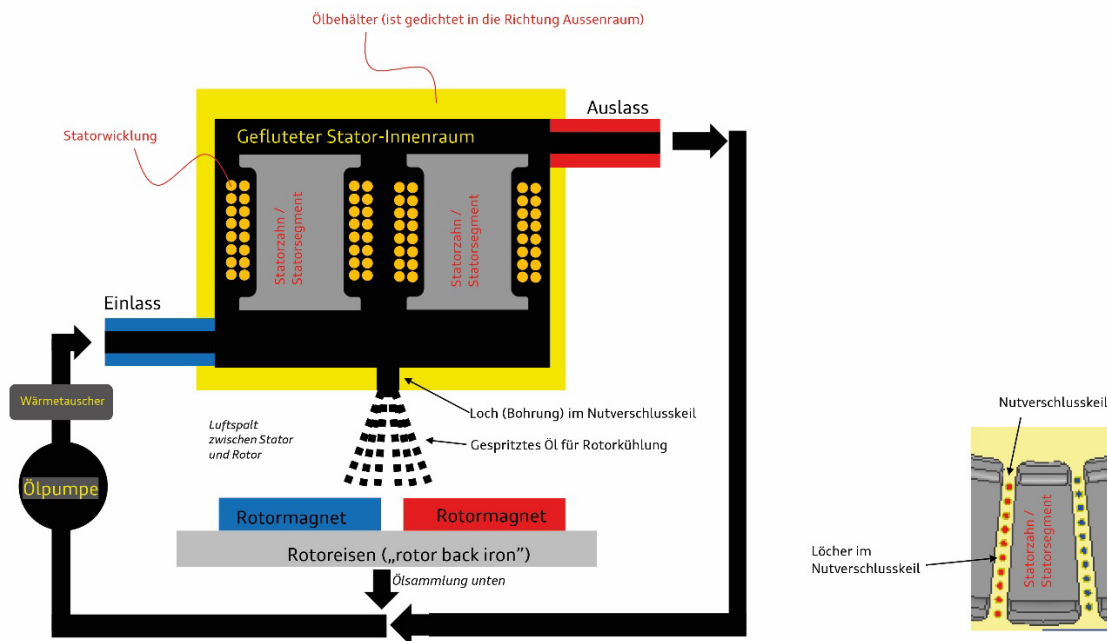
The idea of the invention is a cooling system for e-machines, where the stator active parts (segments, teeth made of iron sheet and the winding) are completely flooded with cooling oil. There are several holes in one or more slot lock wedges from which the oil sprays out. Sprayed cooling oil travels across the air gap and collides with the rotor, with the rotor, thereby cooling the rotor surface. The oil collects at the bottom of the housing, where it is sucked out.

Alternatively, the warm cooling oil flows out of the flooded chamber through an outlet pipe.

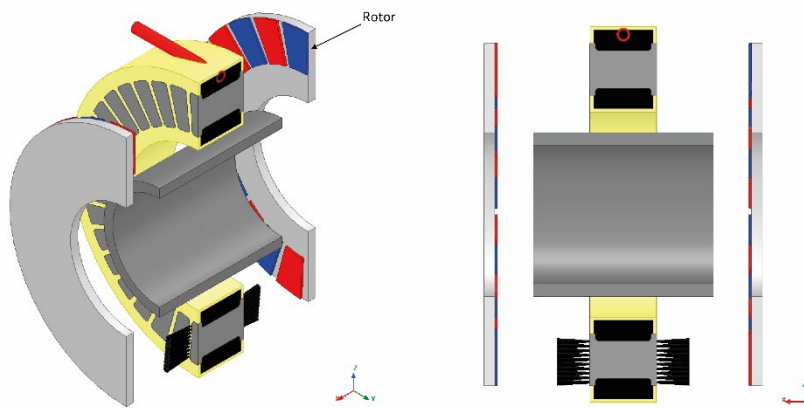
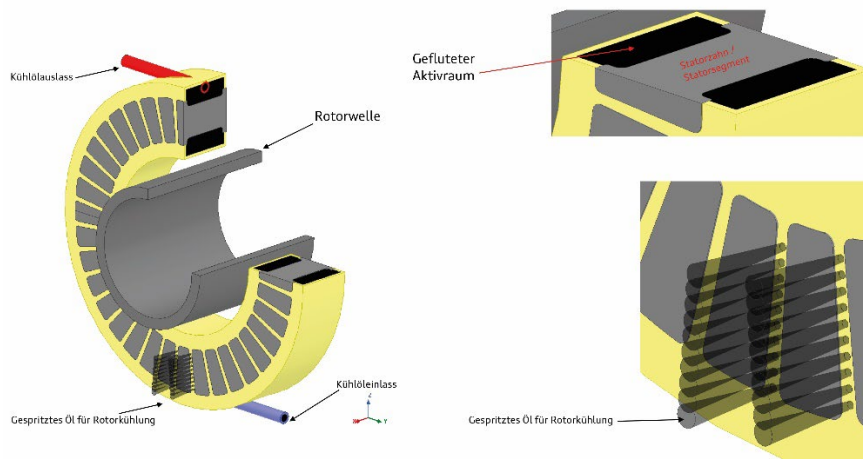
Advantages:

- Holes in the slot lock wedge function as cooling oil spray nozzles, therefore no additional components are required, e.g. oil guide tube or spray nozzles.
- oil guide tube or spray nozzles are required for spray cooling.
- The stator cooling is flooded, i.e. intensive cooling takes place.
- A lot of oil in the air gap is undesirable because of friction losses, so spray cooling is a good choice for the rotor.
- Extremely simple, cheap and robust design of a mixed (flooded and sprayed) oil cooling system
- The oil cooling system is not only applicable for double rotor single stator axial flux machines, but
- but also for radial flux machines or transverse flux machines.

Technical implementation:



Oil cooling in operation:



Out of operation (no oil), shown without windings:

