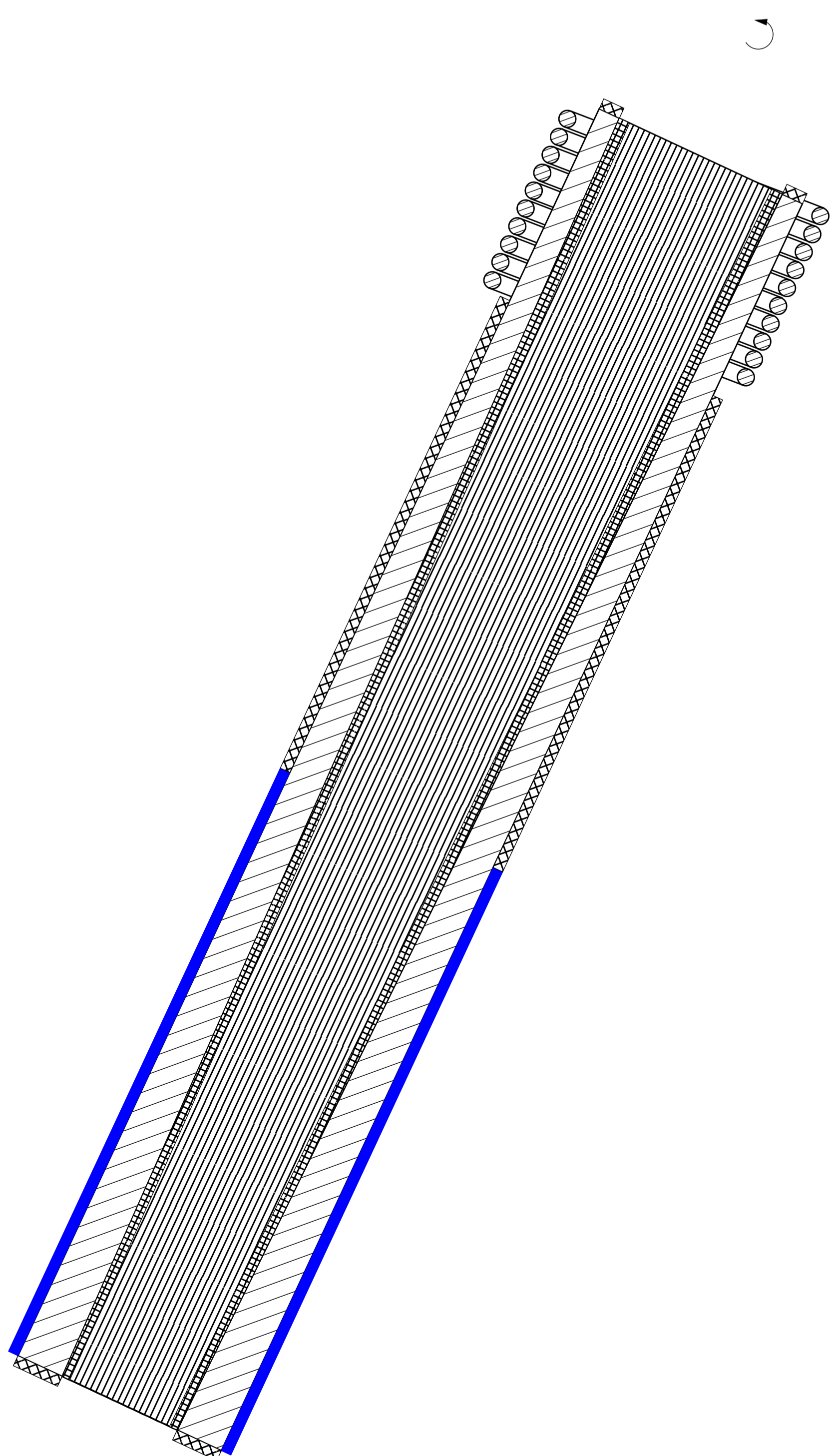


Institut für Mechanik und Thermodynamik

Professur Technische Mechanik/Dynamik

Description:

The performance of a gas and steam turbine power plant can be increased by increasing the fluid temperature. This leads to the requirement of the application of advanced cooling concepts or new materials for the turbine blades. One possible advanced cooling technology is the rotating heat pipe concept, by which a rotating shaft with hollow turbine blades can be cooled with a trapped gas inside the shaft. In this way, we arrive at a two-phase heat transfer device without additional energy supply.



Aims:

In this work, a rotating miniature heat pipe for fair presentations has to be developed. The test bench should be mounted on a movable table. Ordinary roller bearings should be used to support the shaft. The drive should take place with a commercially available electric motor. The heat pipe is to be made of aluminium. The heat should be introduced by means of a coil.

Work programme:

The first step is to define the dimensions of the bearings, the electric motor and the connection of the pipe with the motor. A standard trolley should be used as assembly base. The length and the diameter of the pipe should result from the power of the motor, the inside diameter of the bearings and the length of the trolley. Another criterion for the pipe length is the ability to manufacture an inner cone in the pipe. The components are to be selected and ordered from retailers. The last step is the assembly of the components.

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