

Double cutting disc with curved deformation lines

Reference No: B76166

CHALLENGE

Rotating machinery, as any dynamical system, is exposed to vibrations and deformations during the operation. A rotating disc shows several typical vibrational modes. Each mode consists of two frequencies, whose values diverge as the rotational speed increases. At the so called critical speed the frequency of one of these vibrational modes becomes zero. A zero-frequency vibrational mode corresponds to static deformation of the disc. This deformation can lead to an undesired increase in the width of the cut, excessive wear or even breakage of the disc upon operation. In order to avoid such a severe and also safety-critical failure during operation, the rotational speed of the cutting disc is usually limited so that the disc does not reach its critical speed. Downside of rotational speed reduction is a limited efficiency of the cutting process.

INNOVATION

The invention describes a new conformation of a cutting disc. It is based on a prestressed dual blade, where tensioning lines are e.g. applied by hammering, local heating or roll-tensioning. Based on simulations, the profile of the tensioning lines is calculated depending on the radial position on the disc. A significant increase of the critical speed and hence an optimized cutting performance of the disc is thereby achieved.

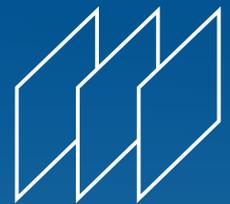


COMMERCIAL OPPORTUNITIES

Cutting blades are widely used in building construction, crafts and for a wide range of materials. The dimension and the material of the cutting disc differ depending on the material to be processed. The invention allows for an improvement in the operation of the cutting disc for all materials and dimensions.

DEVELOPMENT STATUS

A prototype is currently under development. The working principle of the invention has been validated.



BayPAT

Technische
Universität
München



Technology from
TECHNICAL UNIVERSITY
OF MUNICH

IP rights:

CN, EP and US pending

Contact:

Thomas Hummel
+49 (0) 89 5480177 – 39
thummel@baypat.de

**Bayerische
Patentallianz GmbH**
Prinzregentenstr. 52
80538 München
www.baypat.de