

Title (en)

PROCESS AND APPARATUS FOR HARDENING THE SURFACE LAYER OF COMPONENTS HAVING A COMPLICATED SHAPE

Title (de)

VERFAHREN UND VORRICHTUNG ZUM RANDSCHICHTHÄRTEN FORMKOMPLIZIERTER BAUTEILE

Title (fr)

PROCÉDÉ ET DISPOSITIF DE TREMPÉ SUPERFICIELLE DE PIÈCES DE FORME COMPLIQUÉE

Publication

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Application

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Priority

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Abstract (en)

[origin: WO2008049513A1] The invention relates to the hardening of the surface layer of parts of machines, plants and apparatuses and also tools. Objects for which the application is possible and advantageous are components which are subjected to severe fatigue or wear stresses and are composed of hardenable steels and have a complicated shape and whose surface has to be hardened selectively on the functional surfaces or whose functional surface has a multidimensional shape. The process for hardening the surface layer of components having a complicated shape is carried out by means of a plurality of energy input zones. According to the invention, it is characterized in that the energy input zones are conducted on different curved parts separately in space and time and by means of cooperatively working transport systems so that superposition of the individual temperature fields forms a uniform temperature field which completely covers the functional surface of the component and within which each surface element of the later hardening zone of the component attains the selected austenite formation temperature interval $T_{SUB,a}$ at least once and the time interval t between the maximum temperatures $T_{SUB,max}$ of the individual temperature fields is from 3.1 to 3.n smaller than the time $t_{SUB,mS}$ which is required to go below the martensite start temperature M_S during the cooling phase. The apparatus by means of which the process of the invention can be carried out is, according to the invention, characterized in that the energy configuring units are connected to one or more energy sources for optical or electromagnetic radiation and are each fixed to separate but cooperatively operating transport systems.

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