

Title (en)  
METHOD AND APPARATUS FOR HARDENING RING-SHAPED GROOVES BY MEANS OF LASER BEAMS

Title (de)  
VERFAHREN UND VORRICHTUNG ZUM HÄRTEN VON RINGNUTEN MIT LASERSTRAHLEN

Title (fr)  
PROCEDE ET APPAREIL POUR DURCIR DES RAINURES ANNULAIRES PAR FAISCEAU LASER

Publication  
**EP 1173624 B1 20030910 (DE)**

Application  
**EP 00930984 A 20000321**

Priority  
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• DE 19918808 A 19990426

Abstract (en)  
[origin: DE19918808A1] A method for hardening the grooves of steel pistons or steel piston heads whereby hardening of the bottom of said grooves is avoided. The laser beam is directed onto the sides of the groove in an approximately tangential direction in relation to the outer diameter of the piston.

IPC 1-7  
**C21D 1/09**; F16J 9/00

IPC 8 full level  
**B23K 26/00** (2006.01); **C21D 1/09** (2006.01); **C21D 9/00** (2006.01); **F02F 3/00** (2006.01); **F16J 9/00** (2006.01); **F16J 9/26** (2006.01); **B23K 103/04** (2006.01)

CPC (source: EP US)  
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JP2009540222A; WO2007140826A1; US8297179B2; WO2009062486A1

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**DE 19918808 A1 20001102**; DE 50003649 D1 20031016; EP 1173624 A1 20020123; EP 1173624 B1 20030910; JP 2002543275 A 20021217; JP 4700198 B2 20110615; US 6592690 B1 20030715; WO 0065104 A1 20001102

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