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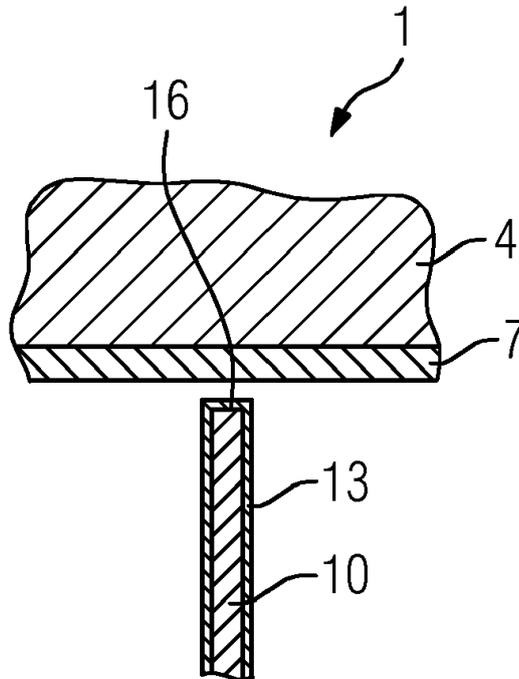
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(54) **COMPRESSOR WITH SIMILAR COATING ON COMPRESSOR BLADES AND COMPRESSOR CASING AND GAS TURBINE**

(57) By applying the same material on the casing opposite to the compressor blade (10) of a compressor (1) a low rear behavior is reached.



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Description

[0001] The invention relates to a compressor wherein the blades of the compressor have a coating against corrosion and erosion and wherein a similar or same coating is applied on the casing of the compressor and a gas turbine.

[0002] Often a Ni-Graphite abrasable coating is been used to reduce the gap between the compressor blades and casing to increase the efficiency of gas turbines. However, once this coating starts rubbing, the detached coating debries start depositing on the turbine airfoils. It has been demonstrated that these deposits can induce damage of the ceramic thermal barrier coating due to alterations of its thermo-mechanical properties.

[0003] It is therefore the aim of the invention to solve the problems given above.

[0004] The problem is solved by a compressor according to claim 1 and a gas turbine according to claim 7.

[0005] In the subclaims further advantages of the invention are shown which can arbitrarily combined with each other to yield further advantages.

[0006] The figure shows one example of the invention of the compressor blade and an outer casing which are both coated.

[0007] The figure and the description are only examples of the invention.

[0008] In the figure a part of the compressor 1 is shown. The compressor 1 has an outer casing 4 and compressor blades 10, which can rotate inside the casing 4.

[0009] The compressor blades 10 have a coating 13 against corrosion and erosion. The matrix of this coating 13 can be any coating, especially a chromate phosphates based matrix is used.

[0010] The coating 13 can preferably also be a bilayer made of the same material, but especially with aluminium particles in the underlying layer.

[0011] A tip 16 of the compressor blade 10 which faces the casing 4 is preferably also coated with the same material of the coating 13.

[0012] The casing 4, which faces the compressor blade 10 also has a coating 7 along the inner circumference of the casing (4), especially only applied locally opposite to the compressor blade 10, which has the similar composition especially the chromium phosphate matrix.

[0013] Chromate phosphate based coatings are state of the art and are shown in US 7,789,953 B2.

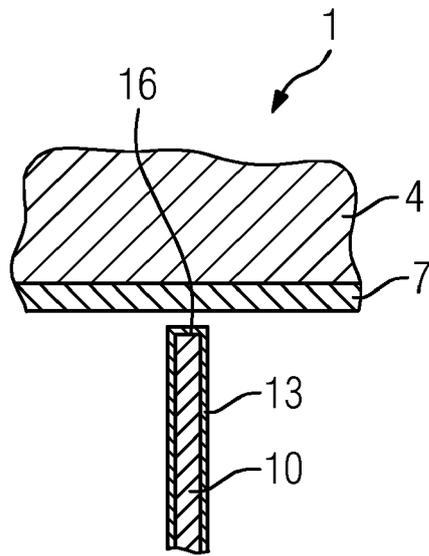
[0014] The use of the same or similar coatings (phosphate-matrix) - metal (aluminium-particles) will reduce the alteration of the thermo-mechanical properties. The resulting debries will not induce any of the known damage. Moreover, these type of coatings have a temperature stability up to 873K. The manufacturing costs are very low and the wear behavior is appropriated for this purpose. These coatings are been used as corrosion protective coatings for compressor airfoils.

[0015] The use of an appropriate coating capable to fulfill the required rubbing behavior and temperature sta-

bility while avoiding the impact on the turbine components is advantageous for service conditions.

Claims

1. Compressor (1), with a casing (4) in which (4) compressor blades (10) are rotatable, wherein the compressor blades (10) have a coating (13), which is optionally also applied on the tip (16) on the compressor blade (10) and wherein at least opposite to the tips (16) of the compressor blades (10) the same matrix material of the coating (13) of the compressor blade (10) is applied on the inner surface of the casing (4).
2. Compressor according to claim 1, wherein the coating (7) of the casing (4) is only locally applied opposite to the tips (16) of the compressor blades (10).
3. Compressor according to one or both of the claims 1, 2, wherein the material of the coatings (7, 13) comprises a chromate phosphate matrix.
4. Compressor according to one or any of the claims 1, 2, or 3, wherein the coating (13) of the compressor blades (10) contains aluminium particles.
5. Compressor according to one or any of the claims 1, 2, 3 or 4, wherein the coating (7) of the casing (4) does not contain aluminium particles.
6. Compressor according to one or any of the claims 1, 2, 3, 4 or 5, wherein the coating (13) of the compressor blades (10) is a bilayer, especially with aluminium particles in the underlying layer.
7. Gas turbine with a compressor according to one of the claims 1 to 6.





EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) F04D
Place of search The Hague		Date of completion of the search 26 April 2016	Examiner Kolby, Lars
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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