

US009200537B2

US 9,200,537 B2

\*Dec. 1, 2015

# (12) United States Patent

#### Bouchard et al.

## (56) References Cited

(10) **Patent No.:** 

(45) Date of Patent:

# U.S. PATENT DOCUMENTS

2,681,788 A 6/1954 Wosika 3,028,141 A 4/1962 Nichols 3,071,346 A 1/1963 Broffitt 3,511,577 A 5/1970 Karstensen 3,730,292 A 5/1973 MacDonald 4,077,206 A 3/1978 Ayyagari 4,106,587 A 8/1978 Nash et al. (Continued)

#### FOREIGN PATENT DOCUMENTS

EP 1849987 A2 10/2007 GB 608236 6/2006

#### OTHER PUBLICATIONS

Broszat, Dominik et al., "Validation of an Integrated Acoustic Absorber in a Turbine Exit Guide Vane", American Institute of Aeronautics and Astronautics/CEAS Aeroacoustics Conference, Jun. 5-8, 2011, Portlant Oregon, p. 1-7.

Primary Examiner — William H Rodriguez

Assistant Examiner — Eric Linderman

(74) Attorney, Agent, or Firm — Norton Rose Fulbright

Canada LLP

### (57) ABSTRACT

A turbine exhaust case for a gas turbine engine has an outer shroud and an inner shroud concentrically defining therebetween an annular gaspath for channelling hot gases. A plurality of circumferentially spaced-apart turbine exhaust struts extends radially across the hot gaspath. The inner shroud may be provided in the form of an acoustic panel. The acoustic panel has a radially outwardly facing surface defining the radially inner flow boundary surface of the gaspath. The acoustic panel is mechanically fastened to the radially inner end of the struts.

### 17 Claims, 4 Drawing Sheets

# (54) GAS TURBINE EXHAUST CASE WITH ACOUSTIC PANELS

(75) Inventors: **Richard Bouchard**, Sorel-Tracy (CA); **Gaetan Girard**, Outremont (CA);

Christian Pronovost, Boucherville (CA)

(73) Assignee: **PRATT & WHITNEY CANADA CORP**, Longueuil, QC (CA)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35

U.S.C. 154(b) by 1027 days.

This patent is subject to a terminal dis-

claimer.

(21) Appl. No.: 13/292,277

(22) Filed: Nov. 9, 2011

(65) Prior Publication Data

US 2013/0115051 A1 May 9, 2013

(51)	Int. Cl.	
` ′	F01D 25/06	(2006.01)
	F01D 25/04	(2006.01)
	F02C 7/20	(2006.01)
	F02C 7/045	(2006.01)
	F01D 25/16	(2006.01)
	F02K 1/82	(2006.01)

(52) **U.S. CI.**CPC ...... *F01D 25/162* (2013.01); *F02C 7/20*(2013.01); *F02K 1/827* (2013.01); *Y10T*29/49323 (2015.01)

(58) Field of Classification Search

USPC ...... 60/796, 797, 798; 415/119, 196, 197; 181/213, 222

See application file for complete search history.

