



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**14.02.2024 Bulletin 2024/07**

(43) Date of publication A2:  
**06.12.2023 Bulletin 2023/49**

(21) Application number: **23176392.1**

(22) Date of filing: **31.05.2023**

(51) International Patent Classification (IPC):  
**F01D 21/00** (2006.01) **F01D 25/14** (2006.01)  
**F01D 25/24** (2006.01) **F01D 25/28** (2006.01)  
**F02C 6/08** (2006.01) **F02C 7/052** (2006.01)  
**F02C 9/18** (2006.01) **F02K 1/80** (2006.01)  
**F01D 17/02** (2006.01) **F01D 9/06** (2006.01)

(52) Cooperative Patent Classification (CPC):  
**F01D 17/02; F01D 9/065; F01D 21/003;**  
**F01D 25/243; F01D 25/285; F02C 6/08; F02C 7/32;**  
**F05D 2240/14; F05D 2240/91; F05D 2250/294;**  
**F05D 2260/38; F05D 2260/606; F05D 2260/607**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB**  
**GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL**  
**NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA**  
Designated Validation States:  
**KH MA MD TN**

(30) Priority: **31.05.2022 US 202217828652**

(71) Applicant: **PRATT & WHITNEY CANADA CORP.**  
**Longueuil, Québec J4G 1A1 (CA)**

(72) Inventors:  
• **FRYER, Michael**  
**(01BE5) Longueuil, J4G 1A1 (CA)**

- **DOBSON, Martin**  
**(01BE5) Longueuil, J4G 1A1 (CA)**
- **ISKRA, Oleg**  
**(01BE5) Longueuil, J4G 1A1 (CA)**
- **LAVOIE, Marc**  
**(01BE5) Longueuil, J4G 1A1 (CA)**
- **PARADISO, Ivan Sidorovich**  
**(01BE5) Longueuil, J4G 1A1 (CA)**
- **DURANLEAU-HENDRICKX, Louis**  
**(01BE5) Longueuil, J4G 1A1 (CA)**
- **Di FLORIO, Domenico**  
**(01BE5) Longueuil, J4G 1A1 (CA)**

(74) Representative: **Dehns**  
**St. Bride's House**  
**10 Salisbury Square**  
**London EC4Y 8JD (GB)**

(54) **JOINT BETWEEN GAS TURBINE ENGINE COMPONENTS WITH A SPRING ELEMENT**

(57) An assembly (20) is provided for a gas turbine engine. This gas turbine engine assembly (20) includes a case (22), a housing (24), a component (26) and a spring element (28). The case (22) includes an aperture (56) that extends axially along an axis (42) through the case (22). The housing (24) is attached to the case (22) with a cavity (74) formed by and axially between the housing (24) and the case (22). The component (26) includes a base (90) and a projection (92). The base (90) is disposed within the cavity (74) and axially engages the case (22). The projection (92) projects out from the base (90) and axially through the aperture (56). The spring element (28) is disposed within the cavity (74). The spring element (28) is compressed axially between and engages the base (90) and the housing (24).

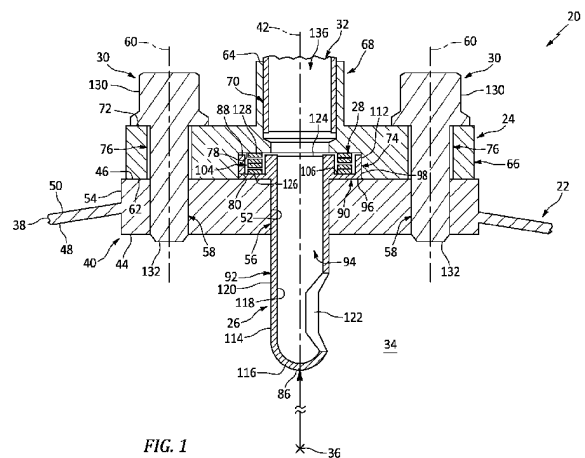


FIG. 1



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 6392

5

DOCUMENTS CONSIDERED TO BE RELEVANT

10

15

20

25

30

35

40

45

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	EP 4 155 522 A1 (PRATT & WHITNEY CANADA [CA]) 29 March 2023 (2023-03-29) * paragraphs [0024] - [0029]; figures 2, 4a, 4b *	1-12	INV. F01D21/00 F01D25/14 F01D25/24 F01D25/28
X	US 2014/013767 A1 (BOHNEY NATHAN J [US] ET AL) 16 January 2014 (2014-01-16) * paragraph [0022]; figure 2 *	1-4,11,12	F02C6/08 F02C7/052 F02C9/18 F02K1/80
X	US 2020/200387 A1 (HU TIN-CHEUNG JOHN [CA] ET AL) 25 June 2020 (2020-06-25) * paragraphs [0020], [0021]; figure 3 *	1-4,9	F01D17/02 F01D9/06
X	EP 3 901 415 A1 (RAYTHEON TECH CORP [US]) 27 October 2021 (2021-10-27) * paragraphs [0045] - [0050]; figure 4 *	1-4,9	
X	GB 2 103 295 A (UNITED TECHNOLOGIES CORP [US]) 16 February 1983 (1983-02-16) * page 1, lines 69-75 *	1,3,4,9	

TECHNICAL FIELDS SEARCHED (IPC)

F01D  
F02K  
F02C  
F04D

The present search report has been drawn up for all claims

1

50

55

EPO FORM 1503 03:82 (F04C01)

Place of search <b>Munich</b>	Date of completion of the search <b>21 September 2023</b>	Examiner <b>Teusch, Reinhold</b>
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



5

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

10

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

15

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

20

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

25

**see sheet B**

30

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

35

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

40

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

45

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

50

**1-12**

55

The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION  
SHEET B

Application Number  
EP 23 17 6392

5

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

10

1. claims: 1-12

15

Assembly comprising a case comprising an aperture, a housing attached to the case, a cavity formed between the housing and the case, a component including a base disposed within the cavity and engaging the case, and a projection projecting out from the base and through the case aperture, a spring element being disposed within the cavity and compressed between and engaging the base and the housing.

---

20

2. claims: 13, 14

25

Assembly comprising a case comprising an aperture, a housing attached to the case, a component including a base comprising a channel, and a projection projecting out from the base and through the case aperture, a spring element seated in the channel, the base and the spring element clamped between case and the housing.

---

30

3. claim: 15

35

Assembly comprising a fluid intake including a base comprising a channel, a projection projecting out from the base, and a passage, the channel extending circumferentially within the base about the passage, the passage extending within the fluid intake between an inlet and an outlet , and a spring element seated in the channel, a portion of the spring element projecting out from the channel and away from the base.

---

40

45

50

55

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 23 17 6392

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-09-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
<b>EP 4155522 A1</b>	<b>29-03-2023</b>	<b>CA 3170543 A1</b>	<b>17-03-2023</b>
		<b>EP 4155522 A1</b>	<b>29-03-2023</b>
		<b>US 2023093292 A1</b>	<b>23-03-2023</b>
-----			
<b>US 2014013767 A1</b>	<b>16-01-2014</b>	<b>NONE</b>	
-----			
<b>US 2020200387 A1</b>	<b>25-06-2020</b>	<b>CA 3047746 A1</b>	<b>20-06-2020</b>
		<b>US 2020200387 A1</b>	<b>25-06-2020</b>
-----			
<b>EP 3901415 A1</b>	<b>27-10-2021</b>	<b>EP 3901415 A1</b>	<b>27-10-2021</b>
		<b>US 2021332710 A1</b>	<b>28-10-2021</b>
-----			
<b>GB 2103295 A</b>	<b>16-02-1983</b>	<b>DE 3226021 A1</b>	<b>03-02-1983</b>
		<b>FR 2510180 A1</b>	<b>28-01-1983</b>
		<b>GB 2103295 A</b>	<b>16-02-1983</b>
		<b>JP H0335500 B2</b>	<b>28-05-1991</b>
		<b>JP S5825522 A</b>	<b>15-02-1983</b>
		<b>US 4406580 A</b>	<b>27-09-1983</b>
-----			