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(54) **CASING HANGER PROFILE FOR MULTIPLE SEAL LANDING POSITIONS**

7,861,789 B2 *	1/2011	Nelson	166/348
8,146,670 B2 *	4/2012	Ellis et al.	166/379
8,186,426 B2 *	5/2012	Nelson	166/88.3
8,205,670 B2 *	6/2012	Nelson	166/84.1
2002/0121368 A1	9/2002	Radi	
2006/0191680 A1 *	8/2006	Nelson	166/208
2010/0116489 A1	5/2010	Nelson	
2010/0126736 A1 *	5/2010	Ellis et al.	166/387
2010/0147533 A1 *	6/2010	Nelson	166/379
2012/0012336 A1 *	1/2012	Galle et al.	166/379

(75) Inventors: **Gary Galle**, Houston, TX (US);
Nicholas P. Gette, Houston, TX (US);
Ryan Herbel, Houston, TX (US)

(73) Assignee: **Vetco Gray Inc.**, Houston, TX (US)

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FOREIGN PATENT DOCUMENTS

EP	2314828 A2	4/2011
GB	2180016 A	3/1987
GB	2244502 A	12/1991

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,665,979 A *	5/1987	Boehm, Jr.	166/208
4,842,307 A	6/1989	Sweeney et al.	
4,932,472 A	6/1990	Boehm, Jr.	
4,978,147 A *	12/1990	Henderson et al.	285/2
5,067,734 A *	11/1991	Boehm, Jr.	277/328
5,199,495 A *	4/1993	Brammer et al.	166/339
5,285,853 A	2/1994	Eckert et al.	
5,360,063 A *	11/1994	Henderson, Jr.	166/208
5,456,314 A	10/1995	Boehm, Jr. et al.	
7,040,412 B2 *	5/2006	DeBerry	166/382
7,762,319 B2 *	7/2010	Nelson	166/84.1

OTHER PUBLICATIONS

GB Search Report issued Oct. 28, 2011 in corresponding Application No. GB1111972.4.

GB Partial Search Report dated Sep. 27, 2011 corresponding to Application No. GB1111972.4.

* cited by examiner

Primary Examiner — Jennifer H Gay

(74) *Attorney, Agent, or Firm* — Bracewell & Giuliani LLP

(57) **ABSTRACT**

A wellhead assembly having a wellhead housing, a casing hanger set within the wellhead housing, and sealing areas provided on opposing surfaces of the wellhead housing and casing hanger. The sealing areas circumscribe an axis of the wellhead assembly along respective axial distances on the wellhead housing and casing hanger. A seal is included with the wellhead assembly that has inner and outer legs that respectively engage the sealing areas and form sealing surfaces against the sealing areas. The axial distances of the sealing areas exceeds the length of the inner and outer legs, so that an original seal can be removed and replaced by a secondary seal, wherein the secondary seal engages sealing areas different from the sealing areas engaged by the original seal.

27 Claims, 4 Drawing Sheets

