



SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 91 80 64

Classification of the application (IPC):

E21B 43/10, E21B 17/00, E21B 29/02, E21B 33/14, E21B 34/14, E21B 43/11

Technical fields searched (IPC):

E21B, F42B, F42D

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
Y A	US 2013299194 A1 (BELL WILLIAM T [US] ET AL) 14 November 2013 (2013-11-14) * paragraphs [0046], [0051], [0055] - [0057]; claim 1; figure 1 *	1-13 14, 15
Y A	US 2017191328 A1 (SOKOLOVE CHRISTOPHER BRIAN [US] ET AL) 06 July 2017 (2017-07-06) * paragraph [0023]; figure 1 *	1-13 14, 15
Y A	US 2761384 A (SWEETMAN WILLIAM G) 04 September 1956 (1956-09-04) * column 1, line 66 - column 3, line 39; figure 1 *	1-7 8-15
Y A	US 8887609 B1 (CHERRY CHRISTOPHER R [US]) 18 November 2014 (2014-11-18) * column 6, line 55 - column 8, line 23; figures 2A-C, 3A-B, 4-6 *	8-10 1-7, 11-15
Y A	US 5753850 A (CHAWLA MANMOHAN S [US] ET AL) 19 May 1998 (1998-05-19) * column 2, line 42 - column 4, line 52; figures 1-7 *	8-13 1-7, 14, 15
Y A	US 4510870 A (WALTERS WILLIAM P [US]) 16 April 1985 (1985-04-16) * column 3, line 22 - column 4, line 21; figures 2-5 *	4, 8-10 1-3, 5-7, 11-15
X A	WO 2020037267 A1 (RAIRIGH JAMES G [US]) 20 February 2020 (2020-02-20) * paragraphs [0061], [0062]; figures 1, 2A-F *	14, 15 1-13

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search The Hague	Date of completion of the search 29 August 2024	Examiner Seide, Stephan
------------------------------	--	----------------------------

CATEGORY OF CITED DOCUMENTS

- | | |
|---|--|
| X: particularly relevant if taken alone | P: intermediate document |
| Y: particularly relevant if combined with another document of the same category | T: theory or principle underlying the invention |
| A: technological background | E: earlier patent document, but published on, or after the filing date |
| O: non-written disclosure | D: document cited in the application |
| & : member of the same patent family, corresponding document | L: document cited for other reasons |

Disclaimer: this document has been automatically generated using data structured in accordance with WIPO standard ST.36 from the database of search reports of the European Patent Office. For technical reasons, its content and layout may differ from that of the original publication. Only the original published information is legally binding.



ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 91 80 64

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 29-08-2024
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 2013299194	A1	14-11-2013	US	2013299194 A1	14-11-2013
			US	2015233219 A1	20-08-2015
US 2017191328	A1	06-07-2017	CA	2948664 A1	14-01-2016
			EP	3167147 A1	17-05-2017
			PL	3167147 T3	13-07-2020
			US	2017191328 A1	06-07-2017
			US	2020095841 A1	26-03-2020
			WO	2016007829 A1	14-01-2016
US 2761384	A	04-09-1956	NONE		
US 8887609	B1	18-11-2014	NONE		
US 5753850	A	19-05-1998	NONE		
US 4510870	A	16-04-1985	NONE		
WO 2020037267	A1	20-02-2020	CA	3109219 A1	20-02-2020
			CA	3115332 A1	20-02-2020
			EP	3837064 A1	23-06-2021
			US	2021032950 A1	04-02-2021
			US	2021262304 A1	26-08-2021
			WO	2020037267 A1	20-02-2020