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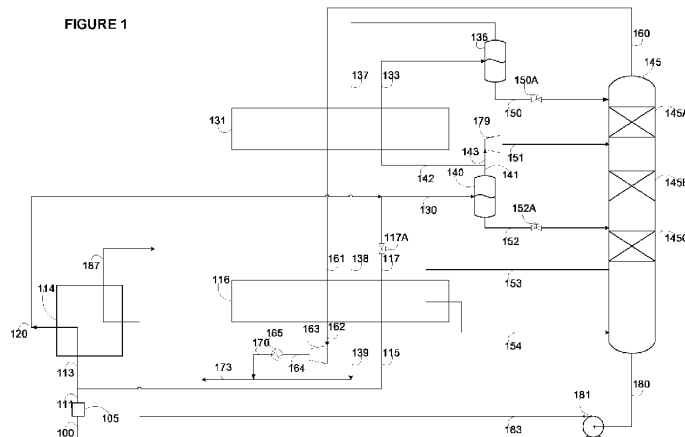
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(54) **PRODUCING LNG FROM METHANE CONTAINING SYNTHETIC GAS**

(57) Described herein are methods and systems for producing liquefied natural gas (LNG) from a methane-containing synthetic gas (MCSG). An MCSG feed stream may be cooled and partially liquefied using one or more heat exchanger units. A first phase separator and a second phase separator in downstream fluid flow

communication with the first phase separator may be used to separate the partially liquefied MCSG stream into a first residue gas stream and first and second feed streams, the first and second feed streams then being fed into a distillation column to produce an LNG stream and a second residue gas stream.

FIGURE 1



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Y	* figure 2 *	10		
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The present search report has been drawn up for all claims				
Place of search Munich		Date of completion of the search 1 April 2023	Examiner Schopfer, Georg	
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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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 April 2023	Examiner Schopfer, Georg
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p>		<p>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</p>	

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CLAIMS INCURRING FEES

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

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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):

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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.

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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:

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see sheet B

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

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

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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:

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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:

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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

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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:

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1. claims: 1-4, 8, 9, 16**Providing a clean reflux**

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2. claims: 5-7**Optimizing separation efficiency**

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3. claims: 10, 12, 13, 17**Divided MCSG feed, cooling 1st portion in CWHE against refrigerant and 2nd portion in 2nd heat exchanger against process streams**

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4. claims: 11, 14, 15, 18**Cooling MCSG feed in one heat exchanger against refrigerant that is cooled in a CWHE and against process streams**

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