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(54) **CENTER CAMSHAFT SCROLL PUMP**

(57) A scroll pump includes a first scroll member having a first involute, a second scroll member scroll member having a second involute, and a camshaft rotatably connected to the first scroll member and to the second scroll member. A link is pivotably connected to the first scroll member and the second scroll member. The first and second scroll members cooperate to define a working volume wherein a working fluid is pressurized during op-

eration of the scroll pump. The second scroll member is configured to equalize pressure across first and second opposed surfaces of an end plate thereof. The second scroll member includes a piston and cavity configured to bias the second scroll member toward the first scroll member in response to pressure across the first and second opposed surfaces of the end plate of the second scroll member.

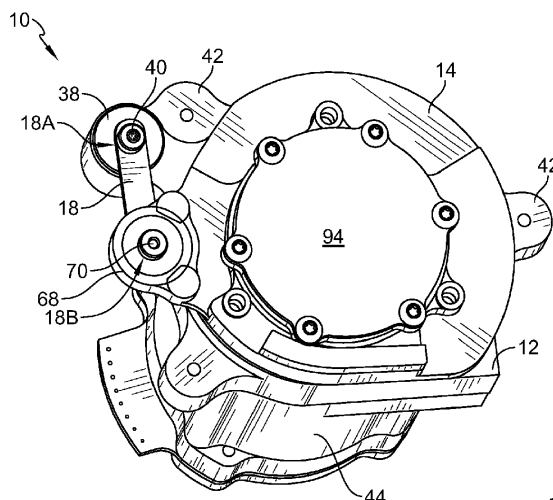


FIG. 1



EUROPEAN SEARCH REPORT

Application Number

EP 22 16 9728

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 906 021 A2 (EMERSON CLIMATE TECHNOLOGIES [US]) 2 April 2008 (2008-04-02) * paragraph [0050]; figure 5 * * paragraph [0144] - paragraph [0147] * -----	1-10	INV. F01C17/06 F01C21/10 F04C18/02 F04C18/067 F01C19/08
X	US 5 258 046 A (HAGA SHUJI [JP] ET AL) 2 November 1993 (1993-11-02) * figures 1,3 * -----	1-10	
X	JP S63 50691 A (TOKICO LTD) 3 March 1988 (1988-03-03) * figure 1 * -----	1-10	
A	EP 1 055 824 A1 (BOC GROUP PLC [GB]) 29 November 2000 (2000-11-29) * figure 1 * * paragraph [0012] - paragraph [0013] * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			F01C F04C
The present search report has been drawn up for all claims			

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EPO FORM 1503 03.82 (F04C01)

Place of search	Date of completion of the search	Examiner
Munich	2 October 2022	Durante, Andrea
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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CLAIMS INCURRING FEES

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

☐ 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):

☐ 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.

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:

see sheet B

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

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

☐ 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:

☒ 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:

1-10

☐ 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:

1. claims: 1-10

Scroll pump comprising a link pivotably connected to the fixed scroll member and pivotably connected to the movable scroll member to preclude rotation of the movable scroll member with respect to the fixed scroll member when the camshaft is rotating.

2. claims: 11-22

Scroll pump comprising a cavity and a vent hole in the end plate of the movable scroll and a piston received within and in sealed engagement with the sidewall of the cavity, to bias the movable scroll member toward the fixed scroll member.

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

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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
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