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Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: CRYOPUMP

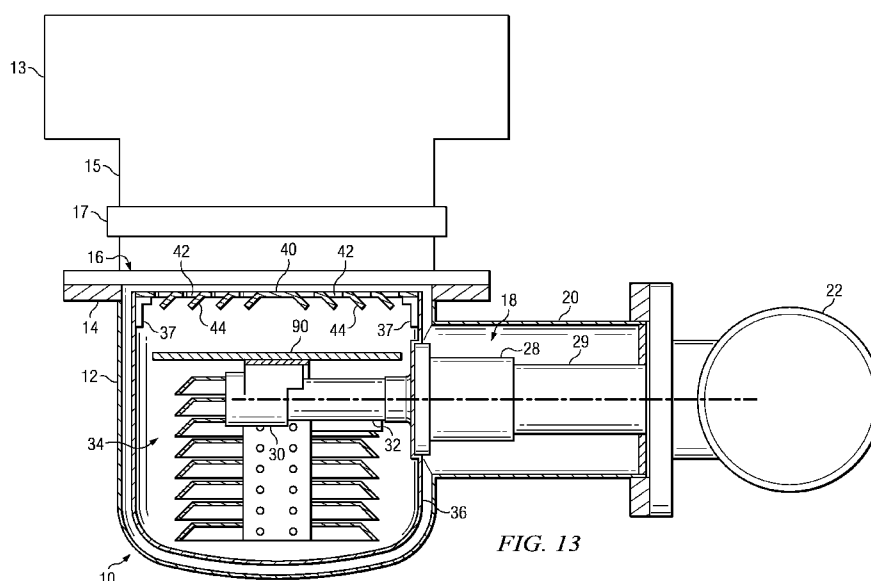


FIG. 13

(57) Abstract: A cryopump has a simple-to-manufacture frontal baffle plate with improved gas distribution and has a large-area second-stage array plate to capture Type II gases. The cryopump has a first-stage frontal baffle plate having orifices and flaps bent from and attached to the orifices. The cryopump has a second-stage top plate that is larger in area than cooling baffles of the second stage array.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/024243

A. CLASSIFICATION OF SUBJECT MATTER

INV. F04B37/08

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 555 907 A (BARTLETT ALLEN J [US]) 3 December 1985 (1985-12-03) cited in the application column 2, line 3 - column 5, line 38; figures 1-11	1-10, 21-35
A	DE 32 16 591 A1 (LEYBOLD HERAEUS GMBH & CO KG [DE]) 10 November 1983 (1983-11-10) page 4 - page 9; figures 1-4	1-10, 21-35
A	GB 1 531 378 A (LEYBOLD HERAEUS GMBH & CO KG) 8 November 1978 (1978-11-08) page 1, line 11 - page 3, line 9; figures 1,2	1-10, 21-35
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Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

18 September 2012

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/024243

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 061 391 A (VARIAN ASSOCIATES) 13 May 1981 (1981-05-13) page 1, line 45 - page 2, line 123; figures 1-3 -----	1-10, 21-35
X	US 4 896 511 A (LESSARD PHILIP A [US] ET AL) 30 January 1990 (1990-01-30) column 1, line 51 - column 4, line 28; figure 2 -----	11-20, 36-38

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/024243

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10, 21-35

A cryopump, comprising:

a first stage frontal baffle plate arranged in an opening of the cryopump to substantially cover the opening, the frontal baffle plate having a plurality of orifices, each orifice having a flap that is bent from and attached to the frontal baffle plate at an edge of the orifice, each flap arranged in a path that passes through the frontal baffle plate.

2. claims: 11-20, 36-38

A cryopump comprising:

a second stage having:

a plurality of cooling baffles, the plurality of cooling baffles thermally coupled to the second stage of a refrigerator, at least a portion of at least one cooling surface coated with an adsorbent material; and
a top plate thermally coupled to the second stage of the refrigerator and arranged between a first stage array and the plurality of cooling baffles, the top plate extending beyond the plurality of cooling baffles as viewed from the frontal baffle.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/024243

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