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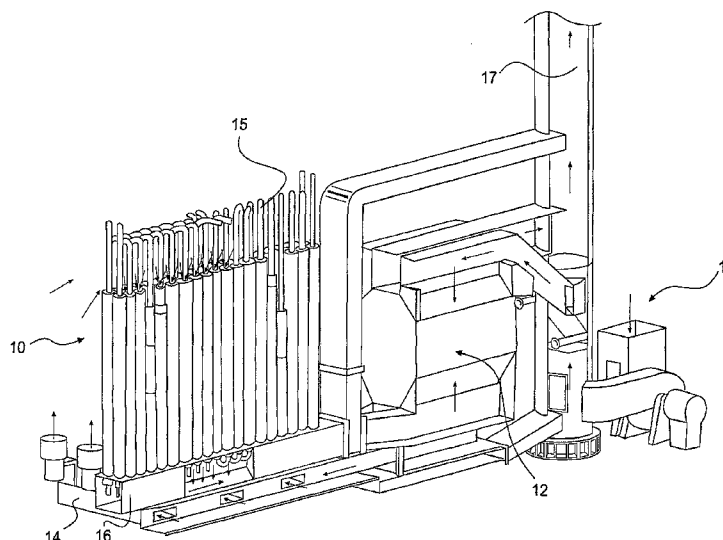
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[Continued on next page]

(54) Title: AN ADVANCED FIRED HEATER UNIT FOR USE IN REFINERY AND PETRO-CHEMICAL APPLICATIONS



(57) Abstract: A fired heater unit is disclosed having at least one radiant heating section with each of the at least one radiant heating section having a heating element located therein. The unit includes a convection section operatively connected to the at least one radiant heating section, wherein the convection section having at least one vertically oriented convection tube. Each of the at least one convection tube being operatively connected to the at least one radiant heating section. Each of the at least one convection tube includes an inner tube having process fluid flowing therethrough, wherein the process fluid being heated by the at least one radiant heating section, and an outer tube extending along a predetermined portion of the inner tube, wherein the outer tube is spaced from the inner tube to form a flow path therebetween.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C10G F28D F28F

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 practical, search terms used)

EPO-Internal, WPI Data, API Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 761 371 A (PROCEDES PETROLIERS PETROCHIM [FR]) 2 October 1998 (1998-10-02) claim 1; figure 1 page 4, line 35 - page 5, line 2 page 5, lines 29-31 page 6, lines 7-19 page 7, lines 20-24	1-8
X	GB 757 762 A (PETRO CHEM PROCESS COMPANY) 26 September 1956 (1956-09-26) figure 1 page 1, lines 57-71	1

☒ 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 document but published on or after the international filing date
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- * & * document member of the same patent family

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	FR 2 133 306 A (INST FRANCAIS DU PETROL) 24 November 1972 (1972-11-24) figure 1 page 2, lines 13-16 -----	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

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