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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Adapting brick for heat exchangers

(57) The present invention refers to an adapting brick for carrying out heat exchangers of furnace air pre-heaters. The brick according to the invention comprises a shaped refractory material body having, in its central part, a longitudinal channel and other longitudinal channels evenly distributed around thereof, characterized in that on the upper face c, there were provided radial ribs d and, on the lower face e, there were provided grooves in the shape of an annulus f.

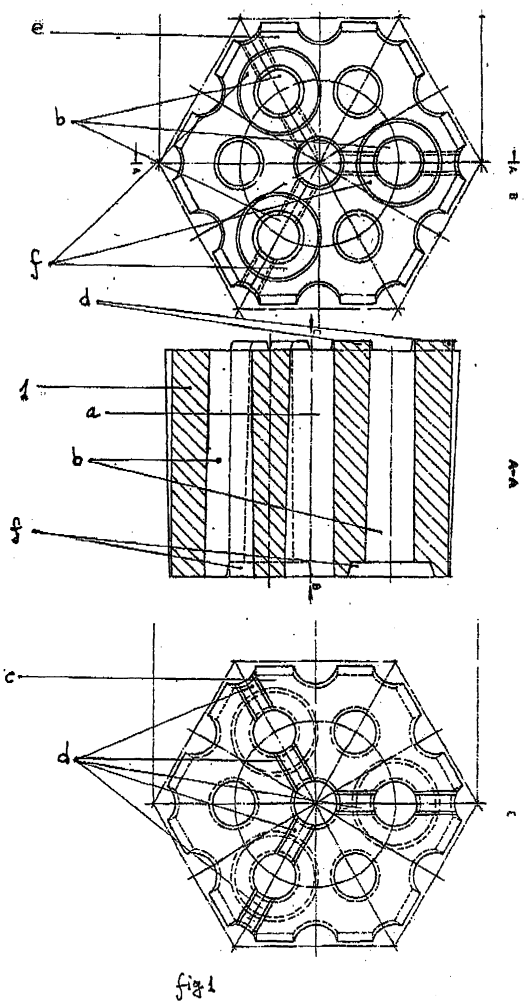

fig 1

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Description

[0001] The present invention refers to an adapting brick for realizing heat exchangers of furnace air preheaters,

[0002] It is known a brick of a six-angle shape in axial section, also destined to realize heat exchangers, provided with a plurality of longitudinal or outwardly shaped channels and having on both upper and lower faces "groove - and - tongue"- type joint elements as an outwardly projected annulus, on one face, and as annular channels performed in correspondence with the annulus, on the other face (FR Patent No. 1096652).

[0003] It is also known a refractory brick for the same purpose, of the same six-angled shape in axial section, yet whereat the joint elements are this time as ribs and channels, respectively, disposed in a radial direction on the upper face and lower face, respectively (RO Patents No. 114914 and No. 107441).

[0004] The first type of brick presents as advantage the fact that it has an increased volume and refractory mass -per cubic meter of structure -given the second type of brick, the one provided with ribs, at the same diameter of the holes.

[0005] Yet, the second type of brick presents an increased exchange surface, per cubic meter of structure and, at the same time, allows a better gas circulation on the horizontal at the same diameter of the holes or, in other words, it allows a better thermal transfer.

[0006] The technical problem solved by the present invention consists in realizing an intermediary brick for adapting or assembling together the two types of bricks such that to become possible to realize a structure combining the advantages of the first type of brick, which has an increased volume and refractory mass - per cubic meter of structure - with the advantages brought by the bricks that allow a better thermal transfer. In other words, to make possible the use of two different types of bricks, that is "groove- and - tongue" - type joint elements at the lower part and, above thereof, - by means of the adapting brick - there will be overlapped rib-joint bricks. The adapting brick for heat exchangers removes the above-mentioned disadvantages and solves the proposed technical problem in that it forms a horizontal complete row in the heat-exchanger structure which has, under said row, bricks of a "groove - and - tongue"- type joint elements and, above said row, bricks provided with a rib-type joint element, and which is thus made up that its lower part is shaped similar to the lower faces of the lower rows of the adapting row and, its upper face is shaped similar to the bricks that form the rows above the adapting row.

[0007] The advantage brought by the invention consists in that, above a heat exchange structure realized from the beginning up to a certain height, with bricks having "groove - and - tongue" - type joint elements, the assembling may be continued until the final height of the heat exchanger, by using a brick having a rib-type joint elements.

[0008] It is further disclosed an invention embodiment example, in connection with the drawing representing, in longitudinal section, an adapting brick for heat exchangers, as well as a view of the upper and lower faces thereof.

[0009] The connecting brick for heat exchangers according to the invention is made up of a body **1** made of shaped refractory material having in its central part a longitudinal channel a and, evenly distributed around thereof, other longitudinal channels **b.**

[0010] On the upper face c of the body **1** there were provided radial ribs **d** oriented from the center of the longitudinal channel **a,** at 120 degree angles with respect to each other, up to the edges of the upper face **c.**

[0011] On the lower face e of the body **1,** there were provided grooves in the form of an annulus **f** around channels **b,** playing the part of a "groove" for the "groove - and - tongue" - type joints realized with the row of bricks they are placed on.

Claims

1. Adapting brick for heat exchangers, comprising a shaped refractory material body having, in its central part, a longitudinal channel and other longitudinal channels evenly distributed around thereof, **characterized in that** on the upper face **c** there were provided radial ribs **d** and, on the lower face **e,** there were provided grooves in the shape of an annulus **f,**

Amended claims in accordance with Rule 137(2) EPC.

1. Adapting brick for heat exchangers comprising a shaped refractory material body having, in its central part, a longitudinal channel and, other longitudinal channels evenly distributed around thereof **characterized in that** on the upper face c there were provided radial ribs d and, on the lower face e there were provided grooves in the shape of an annulus f disposed around some of the longitudinal channels.

2. Adapting brick according to claim 1 **characterized in that** it is used for obtaining a single horizontal adapting row for heat exchanger.

3. Heat exchanger structure made of refractory bricks **characterized in that** it contains:

a) a lower part formed by many horizontal brick rows of a "grove-and-tongue" type joint elements;
b) an upper part formed by many horizontal brick rows of "rib-type" joint elements; and
c)a horizontal bricks row made of adapting bricks defined in claim 1, said bricks row forming an intermediary adapting structure between the

lower "groove-and-tongue" brick structure and the upper "rib-type" brick structure.

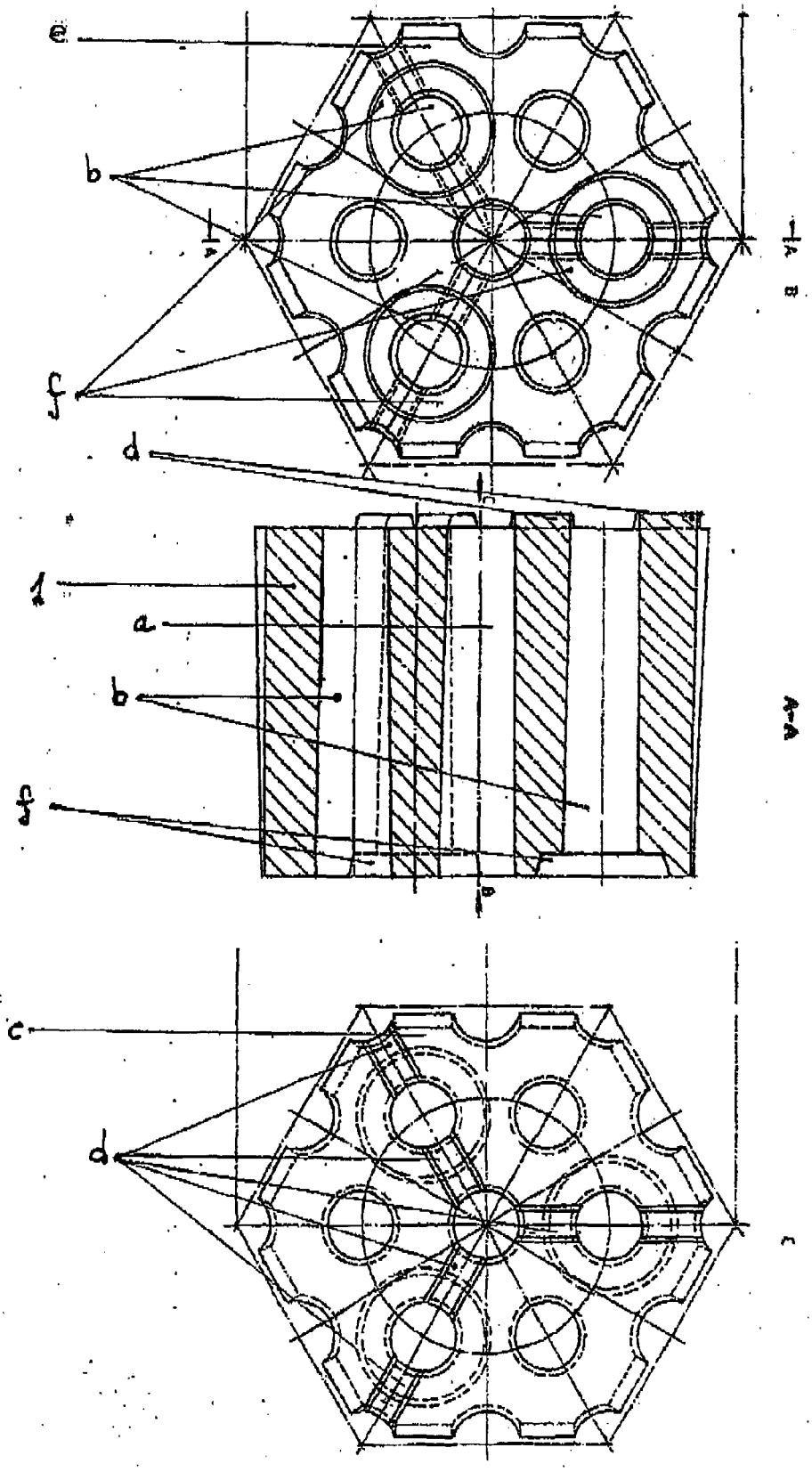

fig 1

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EUROPEAN SEARCH REPORT

Application Number
EP 07 02 1683

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	DE 18 15 101 A1 (HEUSER FRIEDRICH) 25 June 1970 (1970-06-25) *page 2, first and last paragraph* * figures 1-4 *	1	INV. F27D1/04
X	US 5 924 477 A (DORU TATAR [RO]) 20 July 1999 (1999-07-20) * column 1, line 56 - column 2, line 39; claim 1 * * figures 1-3 *	1	
X	RO 113 869 B1 (TATAR DORU [RO]) 30 November 1998 (1998-11-30) * the whole document *	1	
A	US 4 150 717 A (BALKE GEORGE L [US] ET AL) 24 April 1979 (1979-04-24) * column 4, line 19 - lines 20,47 *	1	
A	US R E27 020 E (DRESSER IND INC.) 5 January 1971 (1971-01-05) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC)
A	US 3 549 136 A (BAAB KENNETH A ET AL) 22 December 1970 (1970-12-22) * claim 1; figures 2,3 *	1	F27D C03B C21B E04F F28D
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 December 2007	Gavriliu, Alexandru

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 02 1683

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- FR 1096652 **[0002]**
- RO 114914 **[0003]**
- RO 107441 **[0003]**