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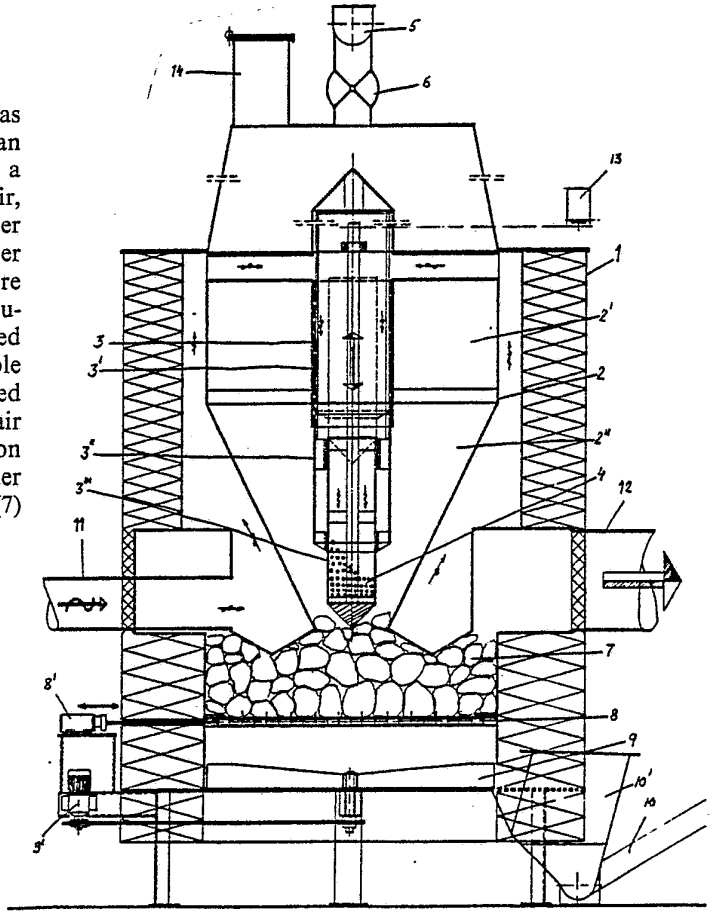
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(54) Title: DEVICE FOR THE PRODUCTION OF GAS TO EXISTING HEATING BOILERS

(57) Abstract

A device for the production of gas. The device has a combustion chamber (2), which is produced with an upper cylindrical part having a circular section and a perforated cover on its upper part for the supply of air, and with a lower conical part (2″) attached to this upper cylindrical part, whereas inside the combustion chamber (2) there is a means (3) displaced in a vertical line, where movement is controlled by a combustion chamber regulator (13). This displaceable means (3) consists of a fixed part (3′) in which there are two telescopic displaceable parts (3″ and 3‴), where the inner part (3‴) is fitted with holes (4) in its lower part for the supply of air through air reduction to the fuel in the combustion chamber (2). There is a hearth which is situated under the combustion chamber (2) and consisting of a filter (7) fitted on vibrating grates (8).



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Device for the production of gas to existing heating-boilers.

This invention relates to a device for the production of gas or a gas-oven in the form of a so-called "pre-oven", in which combustion takes place through air-reduction, to existing heating-boilers such as oil-boilers or another place of combustion.

On the market there are a number of preovens to existing boilers for the burning of oil, and all of them work on the whole according to the same principle with fixed and vibrating grates and fixed combustion-chambers.

The aim of the device according to the invention, is to function through air-reduction with a low and even temperature with a combustion chamber with a changeable volume, which gives a very high grade of efficiency in comparison to previously known technology.

The device according to the invention is characterized by what is evident from the appending patent claims.

The invention will now be more closely described with reference to the appending diagram which shows the device according to the invention in a frontal view. The diagram shows a device 1 for the production of gas or a gas-oven in the form of a so-called "preoven". Device 1 is provided with an intake 11 fitted with a not shown damper-control for primary air and an outlet for collected gas for further treatment in the existing heating-boiler. Device 1 is further supplied with a combustion chamber 2, which consists of an upper cylindrical part 2' having a circular cross-section, and a lower conical part 2" attached to the upper cylindrical part. At the upper part of the device 1 there is conventional equipment in the form of a combustion damper 14, an intake 5

airtight relative to the device 1, for fuel fed from a not shown transporter and a cellfeeder 6 for the distribution of fuel fed. Inside the combustion chamber 2 there is in a vertical line arranged a displaceable means 3 which consists of a fixed part 3' and in this fixed part there are two telescopic parts 3" and 3'" displaceable into each other. The inner part 3"' is supplied with holes 4 in its lower part for the intake of air through air-reduction to the fuel in the combustion chamber. The vertical movement is produced by means of combustion chamber regulators 13 in the form of motors of the usual type. The lower part of the device 1, which is situated under the combustion chamber, is arranged as a hearth consisting of a filter 7 of stones or similar material fitted on vibrating grates 8, which are set in motion by a vibrating-control 8', a feed out device 9 for ashes which is steered by a driving control 9', an ash container 10' filled with an extinguishing substance in the bottom of device 1 and an ash-transporter 10 arranged at the ash-container. Said device 1 is also provided with a not shown steering means for the regulating of the primary air at intake 11. The device 1 functions in the following way: solid fuel like e.g. chips, pellets, charcoal or the like, comes into the device 1 at the airtight intake 5 via the not shown transporter, and continues, after distribution by the cell-feeder 6, down into the combustion chamber, due to the law of gravity, where the primary air has been fed via the intake 11, which has received a signal for the required heat load from the not shown steering means. When e.g. chips are used no tar production takes place, as the tar will always be in the form of gas. The primary air enters the device 1 and goes on the outside of the combustion chamber 2 for the simultaneous drying of the fuel and cooling of the combustion chamber and enters the combustion chamber through its perforated cover on its upper part. From this central part the air goes into the displaceable telescopic means 3 which is in vertical line. This means consists of

a fixed and two movable parts. The inner movable part 3"' has holes 4 in its lower part for the supply of air through air reduction to the fuel in the combustion chamber. The vertical motion takes place by means of combustion chamber regulators 13 in the form of motors, so that a changeable air distribution - air reduction - is achieved by the part 3"' of the telescopic means 3 and at the same time a variable combustion chamber, which changes volume according to the required heat from the maximum to 30 % thereof. The variable combustion chamber has always a steady flame and a constant temperature because of its conical shape. The gases which are produced by gasification through air reduction descend to the hearth and are cleaned by filter 7, which can consist of different materials, such as stone or the like and are situated on the vibrating grates 8 which are in turn set in motion by the vibrating control 8' as required. The gases produced during the air reduction process continue, after treatment from the filter out through the outlet 12 for further treatment in the existing boiler, in the form of oil-burning or another place of combustion. The ash produced is sent via the feed-out device 9 which is steered by driving control 9', to the ash container 10' having extinguishing substance, for further transportation out on the ash transporter 10.

The invention is of course not limited to this design but can of course be varied within the scope of the idea.

CLAIMS

1. Device for the production of gas, where combustion takes place through air reduction, to existing heating-boilers, such as oil-boilers or other places of combustion, c h a r a c t e r i z e d in that the device (1) is provided with an inlet (11) fitted for primary air, an outlet (12) fitted for the gas formed, conventional equipment in the form of combustion damper (14), an intake (5) which is airtight relative to the device fitted for the intake of fuel, and a cell-feeder (6) fitted for the distribution of the fuel fed, a combustion chamber (2) which is produced with an upper cylindrical part (2') having a circular cross section and a perforated cover on its upper part for the supply of air and with a lower conical part (2") attached to the upper cylindrical part, whereas inside said combustion chamber (2) there is a means (3) displaced in a vertical line where movement is controlled by a combustion chamber regulator (13), said displaceable means (3) consisting of a fixed part (3') in which there are two telescopic parts (3" and 3"') displaceable into each other, where the inner part (3"') has holes (4) fitted in its lower part for the supply of air through air reduction to the fuel in the combustion chamber (2), a hearth, which is situated under the combustion chamber (2) and consisting of a filter (7) fitted on vibrating grates (8), a feed-out device (9) which is situated under the filter (7) for ashes, an ash container (10') having extinguishing substance and placed at the bottom of the device (1) and an ash transporter (10) fitted at the ash container.

2. Device according to claim 1, c h a r a c t e r i z e d in that the intake (11) for primary air, the outlet (12) for gas formed and the combustion chamber (2) are produced so that the required heat is regulated by the special steering devices.

3. Device according to claim 1, c h a r a c t e r i z e d in that the combustion chamber regulator (13) is produced in the form of motors.

4. Device according to claim 1, c h a r a c t e r i z e d in that the filter is in the form of stones or similar material.

5. Device according to claim 1, c h a r a c t e r i z e d in that the vibrating grates (8) are produced to be set in motion by the vibrating control (8').

6. Device according to claim 1, c h a r a c t e r i z e d in that the feed-out device (9) is produced to be steered by a driving control (9').

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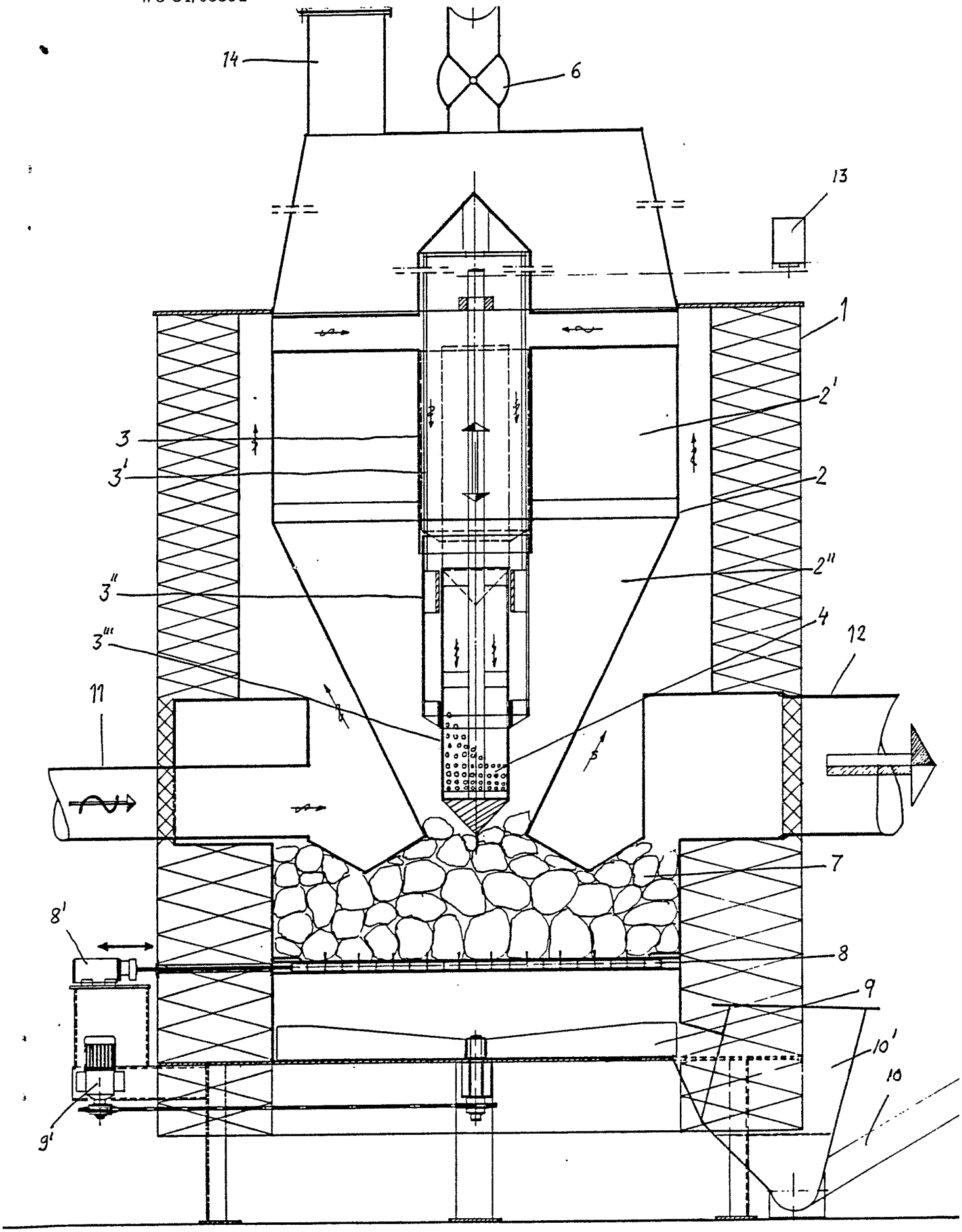


Fig.

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE84/00052

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

F 23 B 1/28; C 10 J 3/20

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	C 10 J 3/00-3/44, 3/58-3/84; F 23 B 1/00-7/00; F 23 H 9/00-9/12; F 23 L 1/00-5/00
US Cl	48: 63, 73, 74, 76, 77, 85, 86, 87, 89, 90, .../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
Y	DE, A1, 2 804 968 (STÄHLI) 31 August 1978 & FR, 2381965 CH, 620979 SE, 7801937	1
Y	FR, A, 564 416 (DUVANT) 29 December 1923	1
Y	FR, A, 2 364 962 (GUNNERMAN) 14 April 1978	1
Y	US, A, 1 776 876 (WINKLER) 30 September 1930	1
Y	US, A, 2 516 974 (GARRISON) 1 August 1950	1
Y	GB, A, 1 471 403 (ABERNETHY) 27 April 1977	1
A	US, A, 2 054 154 (CARSON) 15 September 1936	1

* Special categories of cited documents: [15]

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

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"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

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
1984-05-16	1984 -05- 21
International Searching Authority [1]	**Signature of Authorized Officer [20]**
Swedish Patent Office	Mats Hammar Mats Hammar

K.L.

Form PCT/ISA/210 (second sheet) (October 1981)

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields Searched (cont)

US Cl 99, 101, 111, 113, 119, 120, 123, 126, 128, 197, 202, 203, 204, 206-210; 110: 31, 229-234

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10]

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

1. ☐ Claim numbers....., because they relate to subject matter [13] not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., 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 [13], specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [11]

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

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ 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 claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.