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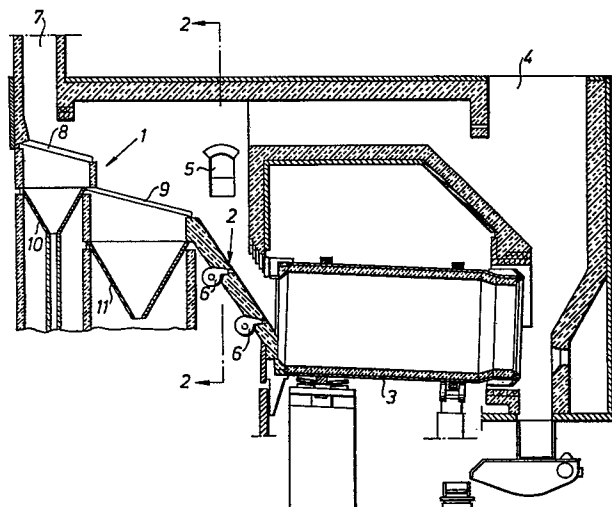
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⑤④ **An incinerator plant for burning solid and liquid waste of any kind.**

⑤⑦ A plant for burning solid and liquid waste comprises a grate section (1), a chute (2), a rotary kiln (3) and an after-burning chamber (4). The mentioned elements are placed in succession in the intended travelling direction of the waste through the plant. Separate firing openings (5, 7) are provided for each of the mentioned sections for feeding a particular waste product to one of said sections.

In this plant, both light and very heavy waste can be combusted in one and the same plant.



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PATENTANWÄLTE
EUROPEAN PATENT ATTORNEYS

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Vølund Miljøteknik A/S, Glostrup, Denmark

AN INCINERATOR PLANT FOR BURNING SOLID AND LIQUID WASTE
OF ANY KIND.

TECHNICAL FIELD

The object of this invention is to provide a furnace suit-
5 able for incinerating a wide number of different waste pro-
ducts or refuse, for instance in the form of garbage, che-
mical waste, industrial waste, hospital waste.

BACKGROUND ART

The currently known incinerator plants are arranged and
10 constructed to remove or incinerate only one of the kinds
of refuse mentioned or in some cases a few of these kinds
of refuse simultaneously.

Naturally, a disadvantage of these known plants is that va-
rious types have to be installed in a refuse disposal plant
15 to make it possible to handle any sort of refuse. As the
trend is towards fewer but very large refuse disposal plants,
it is necessary that these plants be designed so that they
are capable of handling refuse of practically any kind.

DISCLOSURE OF INVENTION

20 The object of the invention is attained through a plant
that is characteristic in that it comprises a) a grate sec-
tion, b) a chute, c) a rotary kiln and d) an afterburning

chamber, these sections being placed in succession in the intended travelling direction of the refuse, and in that separate openings are provided for each of the mentioned sections for feeding a specific waste product to one of
5 the sections.

In a plant constructed as described above, the lighter refuse such as household refuse, bark and industrial waste containing a large part of easily combustible materials can be burned in the grate section in a manner known per
10 se. The refuse submitted from the grate section is dried up and thrown down into the rotary kiln from the edge of the last step grate. Through an opening placed by the slide, further refuse in the form of, for instance, sludge, paint residue, oil or corresponding residual products from
15 the petrochemical industry can be added to the "carpet" of refuse already thrown down on the chute. This liquid waste is distributed evenly over the large surface resulting from the waste dropped from the stepped grates. In the following rotary kiln, the refuse dried out on the stepped grates
20 and the fluid waste absorbed by said refuse from the chute will be completely burned, as the rotation of the kiln ensures that all particles are exposed to oxidation at high temperatures. Finally, in the afterburning chamber in which the flue gas submitted from the rotary kiln typically has
25 temperatures from 750° to 1100°C, polluted waste water can be combusted as the waste water can be fed through nozzles into the afterburning chamber.

According to the invention, the chute connecting the grate section and the rotary kiln can be provided with a bottom
30 surface impermeable to waste, and at the bottom of said chute a number of burners can be placed for afterburning of the refuse conveyed from the grate section and for providing said refuse with a temperature sufficiently high for the succeeding combustion in the rotary kiln.

Said bottom surface impermeable to the waste ensures that the liquid waste fed to the chute is advanced to the rotary kiln. The burners provided at the bottom of the chute make it possible to adjust the drying of the waste supplied from the grate section.

According to the invention, the kiln rotating around a downwards inclined axis can be provided with a conically pointed or confined outlet.

In this way, the liquid waste is made to remain in a "pocket" at the lower part of the rotary kiln until complete combustion has occurred.

In a preferred embodiment of a plant according to the invention, nozzles are provided in the afterburning chamber for feeding highly polluted waste water for combustion of the organic material therein and vaporization of the liquid component.

In this manner, the quantity of heat in the flue gas from the rotary kiln is suitably used for decomposing even highly polluted waste water.

By placing one or more waste oil burners in the afterburning chamber, as suggested according to the invention, it is possible to use waste oil to increase the temperature in the afterburning chamber and thereby increase the effectivity of combustion of the mentioned polluted waste water.

BRIEF DESCRIPTION OF THE DRAWING

In the following, a more detailed description of the invention will be given with reference to the accompanying drawing, in which

fig. 1 schematically shows a cross section of a plant de-

signed in accordance with the invention, and
fig.2 a cross section along the line 2-2 of fig. 1.

The plant shown in fig. 1 comprises a grate section which
5 collectively has the reference number 1, a chute which is
indicated by the reference number 2, a rotary kiln 3 and an
afterburning chamber 4.

The part of the waste intended for combustion and consist-
ing of relatively light waste in the form of household re-
10 fuse, bark or industrial waste having a relatively large
content of easily combustible materials is fed through the
firing shaft 7 at the end of the plant shown to the left
of fig. 1. The material thus fed falls down on the in-
clined step grates, two of which are shown on the drawing,
15 said grates being indicated by the reference numbers 8 and
9. The slag formed by the combustion is discharged in a
manner known per se through the slag-sluices 10 and 11
placed underneath the grates.

From the lower edge of the grate 9 the part of the waste
20 not yet combusted but only dried out is thrown down on the
inclined chute 2. The dried refuse is whirled up by the
falling waste and therefore, heavier waste in the form of,
for instance, drained sludge can be added through the open-
ing 5, said sludge being distributed evenly among the whirl-
25 ed-up, dried waste.

As indicated on the drawing, burners 6 can be placed in the
bottom of the chute 2, which burners can be used for ob-
taining a correct temperature of the waste supplied to the
rotary kiln. At a correct temperature a melting of the pro-
30 duct is obtained under complete decomposition of the che-
mical substances, resulting in a clean, sterile slag.

As shown on the drawing, the rotary kiln 3 has a conically pointed outlet ensuring detention of liquid waste. The dried out waste is oxidized at high temperatures in the rotary kiln, and thereby a complete combustion of the material is obtained.

For combustion of materials difficult to burn the rotary kiln will receive the necessary extra heat from the burners 6 placed at the bottom of the chute.

In the afterburning chamber 4, an afterburning takes place of the gases which may not have been combusted in the rotary kiln 3.

As a consequence of the design of the afterburning chamber, the flue gas will be whirled up and a high degree of mixing will take place whereby a complete combustion is achieved even in the case of low air supply.

In figure 2 it is indicated how waste in the form of, for instance, dewatered sludge may be fed through the inclined firing chute 5 for throwing down on the chute 2.

The invention is not limited to the characteristic features just shown and described, and it should be noted that it will be possible for anyone skilled in the art to carry out a number of modifications, for instance, placing more rotary kilns in succession or parallel to each other, and providing a greater number of inclined chutes or step grates than the number shown on the drawing, as the idea underlying the invention, as mentioned in the above, is the combination of supplementary sections of combustion plants known per se and providing openings for feeding the waste to the very section in which the combustion takes place most effectively for the particular product.

C L A I M S

1. A plant for burning solid and liquid waste of any kind c h a r a c t e r i z e d in that it comprises
a) a grate section (1), b) a chute (2), c) a rotary kiln(3)
5 and d) an afterburning chamber (4), said sections being placed in succession in the intended travelling direction of the waste, and separate openings (5, 7) being provided for each of the mentioned sections for feeding a specific waste product to one of the sections.
- 10 2. A plant according to claim 1, c h a r a c t e r i z - e d in that the chute (2) connecting the grate section(1) with the rotary kiln (3) has a bottom side impermeable to the waste and a number of burners (6) are placed at the
15 bottom of said chute (2) for afterburning the waste conveyed from the grate section (1) and for providing said waste with a temperature sufficiently high for the succeeding combustion in the rotary kiln (3).
3. A plant according to claims 1 and 2, c h a r a c - t e r i z e d in that the kiln (3) rotating around the
20 downwards inclined axis has a conically pointed or confined outlet.
4. A plant according to any one of the preceding claims, c h a r a c t e r i z e d in that the afterburning chamber (4) is provided with nozzles for feeding highly polluted
25 waste water for combustion of the organic material therein and vaporization of the liquid component.
5. A plant according to claim 4, c h a r a c t e r i z - e d in that one or more waste oil burners are placed in the afterburning chamber (4).

Fig.2

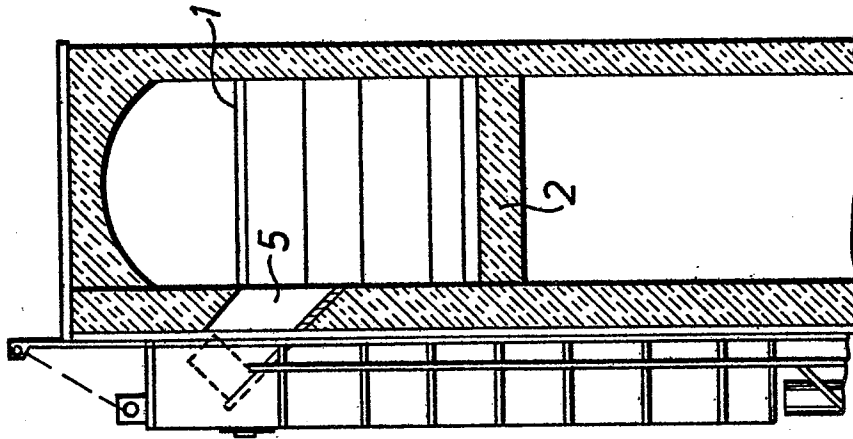
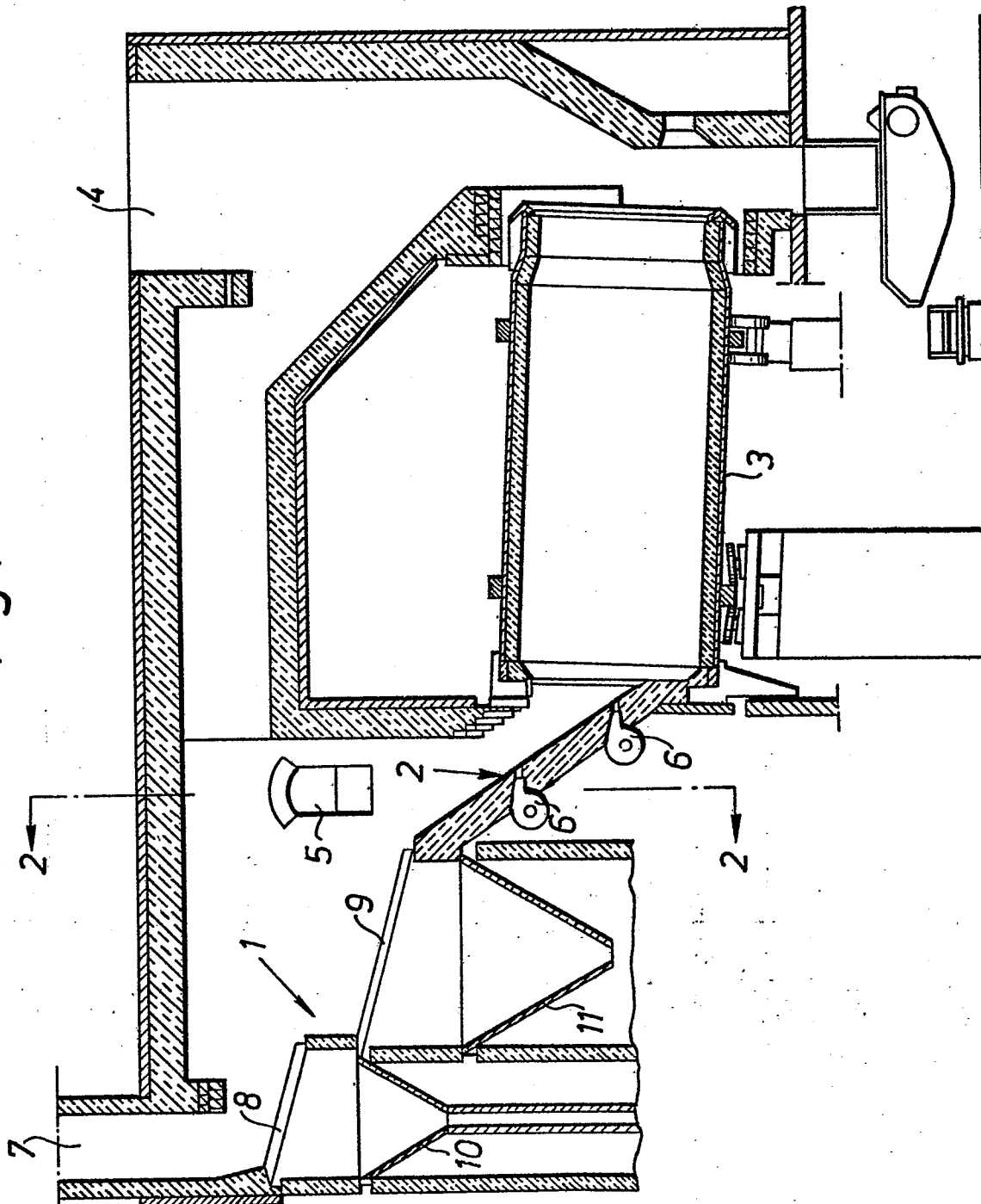


Fig.1





European Patent
Office

EUROPEAN SEARCH REPORT

Application number
0068319

EP 82105296.6

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	<u>AT - B - 240 502</u> (WISTRA) * Totality * & GB-A-928 014 --	1,5	F 23 G 5/06
A	<u>AT - B - 248 591</u> (KOPPERS-WISTRA) * Totality * --	1	
A	<u>DE - A - 1 451 511</u> (KOPPERS-WISTRA) * Claims 1-3; fig. 1 * --	1,5	
A	<u>US - A - 3 317 202</u> (CATES) * Column 3, lines 46-72; fig. 1 * --	1	F 23 G 5/00 F 23 G 7/00
A	<u>US - A - 3 808 989</u> (KNAAK) * Column 4, lines 40-65; column 5, lines 7-12; fig. 1 * ----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl. 3) F 23 G 5/00 F 23 G 7/00
			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
☒ The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search VIENNA		Date of completion of the search 05-10-1982	Examiner TSCHÖLLITSCH