

[54] EMISSION PREVENTION IN COKING OVENS

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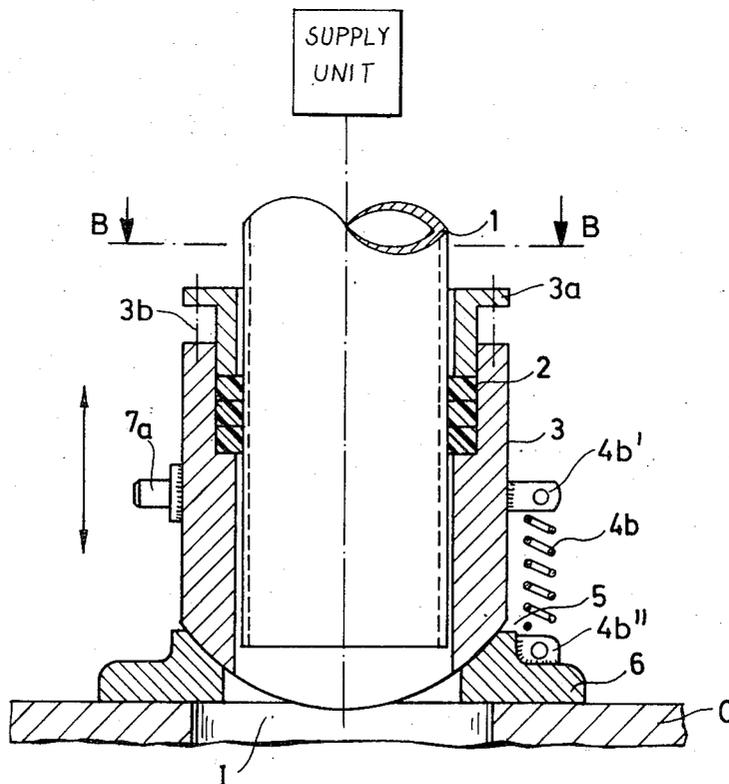
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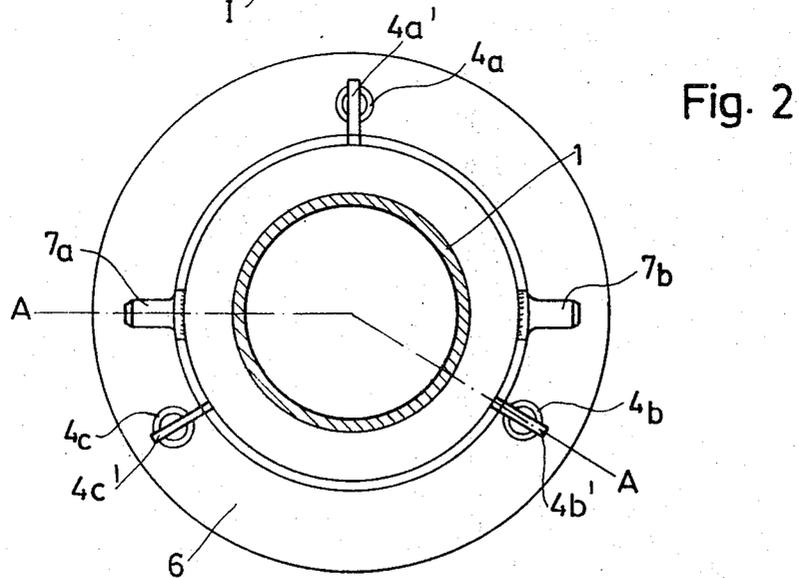
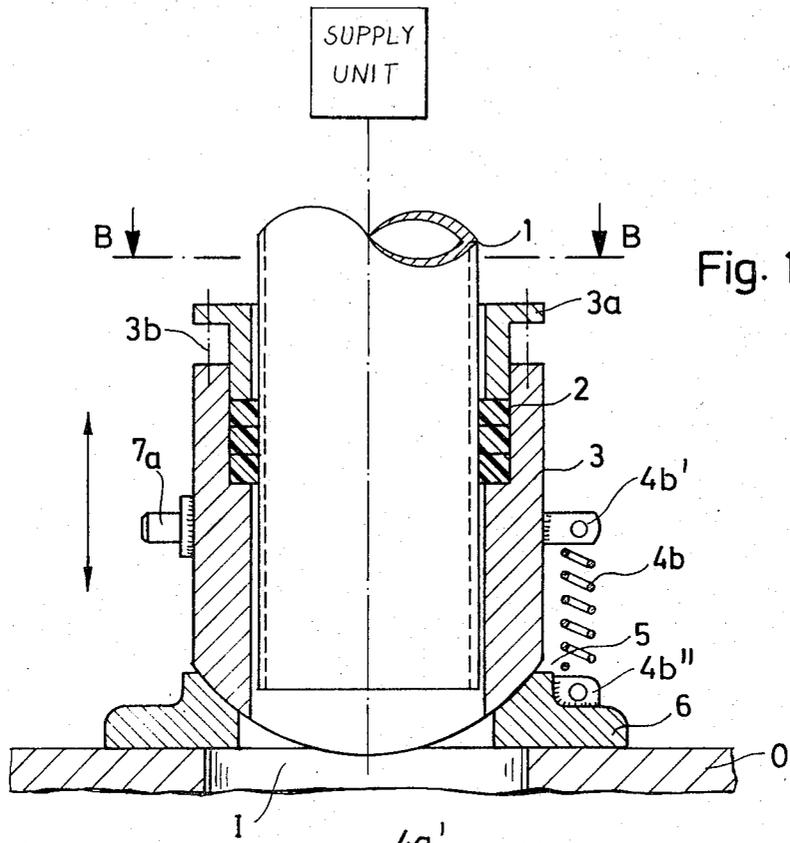
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[57] ABSTRACT

The coking oven has an inlet through which material to be coked is to be admitted, and a supply arrangement is movable above the coking oven for supplying such material. A filler pipe is downwardly extendable from the supply arrangement and has a lower end portion which can be placed into registry with the inlet. A terminal section on the lower portion embraces the same and is sealingly connected therewith. A lower end of the terminal section projects downwardly beyond the lower end portion of the filler pipe and is part-spherically shaped, and surrounded and in tilting engagement with an annular member which is connected with the terminal section by springs. The annular member thus can be seated on the wall surrounding the inlet and, if either the pipe or the wall having the inlet should be inclined relative to one another, the annular member can accommodate itself to this inclination and reliably seal the inlet against the escape of emissions.

4 Claims, 2 Drawing Figures





EMISSION PREVENTION IN COKING OVENS

BACKGROUND OF THE INVENTION

The present invention relates generally to ovens, and more particularly to coking ovens. Still more particularly the invention relates to an arrangement for preventing emission from coking ovens when the latter are being supplied with material.

Coking ovens have an upper wall provided with a number of inlets leading to the respective coking chambers. Material to be coked, that is coal, is admitted through these inlets from above, usually by means of carriages or similar supply devices which can move along and above the wall having the inlet. Two criteria are most important in the supply of such material, namely on the one hand that the coal be able to run freely out of the supply arrangement into the inlet, and on the other hand that the occurrence of emissions (coal dust, gases or the like) be prevented as much as possible. The present invention is particularly concerned with this latter aspect which requires, of course, that the inlet be closed tightly with respect to the ambient atmosphere during the filling operation.

It is known from the prior art to have the carriages move along above the upper wall of the coking oven, for instance on tracks or the like, and to extend telescopic filler tubes or pipes downwardly from the carriage into registry with the inlet through which material is to be admitted. This is for instance described in Groszkinsky, *Handbuch des Kokereiwesens*, Vol. 1, 1955, page 249. Very recently the industry has also been experimenting with other means of supply, that is with continuous supply devices such as conveyors or the like.

The problem in the prior art is that if either for some reason the filler pipe is not exactly normal to the upper surface of the wall of the oven in which the inlet is provided, or if for some reason the filling opening frame should be inclined to the pipe, emissions can occur from the inlet because the lower end of the filler pipe can now no longer properly seal the inlet opening. In actual practice the occurrence of these problems is unavoidable and has led to considerable difficulties in the attempt to provide the desired seal, especially in view of the fact that more and more stringent requirements are made concerning the prevention of emissions into the ambient atmosphere. The problem has heretofore been thoroughly annoying when the conical surface which conventionally bounds the inlet opening in the coking oven has been used as a sealing surface for the conically configured end portion of the filler pipe.

SUMMARY OF THE INVENTION

It is, accordingly, a general object of the invention to overcome the disadvantages of the prior art.

More particularly it is an object of the invention to provide, in an oven, particularly a coking oven, a novel arrangement which avoids the possibility that emissions may occur during filling of material into the oven.

In keeping with these objects, and with others which will become apparent hereafter, one feature of the invention resides, in an oven, especially a coking oven, in a combination which comprises wall means having an inlet through which material is to be admitted into the oven, and supply means for supplying material to be so admitted. A filler pipe has a lower end portion and is extendable downwardly from the supply means toward

the inlet in substantial registry therewith when the supply means is located above the inlet. A terminal section is provided on the lower end portion for tightly connecting the interior of the filler pipe with the inlet. The terminal section comprises a tubular member coaxial with the lower end portion projecting from the same and having a part-spherical free lower end. An annular member is located downwardly adjacent the free lower end and has a surface in mating engagement with the part-spherical free lower end so that the annular member is tiltable relative to the tubular member. Spring means connects the annular member with the tubular member.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary vertical section through an embodiment according to the present invention, on line A—A of FIG. 2; and

FIG. 2 is a section taken on line B—B of FIG. 1, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing the embodiment in FIGS. 1 and 2 in detail it will be seen that a supply unit has been illustrated only diagrammatically, being well known to those skilled in the art. Telescopically extendable in downward direction from the supply unit, in a manner well known to those skilled in the art, is a filler pipe 1 of which only the lower end portion has been illustrated. The upward and downward movement of the pipe 1 is designated by the double-headed arrow in FIG. 1. An upper wall of a coking oven O has been fragmentarily and diagrammatically illustrated, being seen to be provided with an inlet I through which material (i.e. coal) is to be admitted into the oven. Usually, such ovens have four or five or perhaps even more such inlets in their upper wall, but one will suffice for purposes of illustration.

The lower end portion of the pipe 1 is embraced and externally surrounded by a terminal section having a tubular member 3. Although the entire pipe 1 could be raised and lowered, the present invention shows in the illustrated exemplary embodiment that it is possible to have only the terminal section, namely the tubular member 3 thereof, be raised and lowered as indicated by the double-headed arrow 1. Located in the recess in the inner circumferential wall of the tubular member 3 is a packing 2, in form of annular sealing members which may, for instance, be of Teflon (TM), hard rubber, asbestos, graphite or graphite-asbestos rope, to mention only a few suitable materials. A sleeve 3a is threaded onto the exterior of the filler pipe 1 and extends into this recess of the tubular member 3, serving to retain the packing material 2 therein. The sleeve 3a may be connected with the tubular member 3 by means of bolts, rods or the like 3b having a sufficient length to permit the member 3 to perform upward and downward movements as shown by the arrow in FIG. 1.

Thus, during the telescoping apart and telescoping together of the pipe 1 and tubular member 3, the packing 2 reliably prevents the escape of emissions.

The lower free end of the tubular member 3 is of part-spherical configuration and is in contact with a similarly configured surface of an annular member 6. They cooperate therefore in the manner of a ball-and-socket joint, meaning that the member 6 can swivel or tilt with respect to the member 3. The member 6, whose interface with the member 3 is indicated by the arrow 5, is connected to the member 3 in such a manner as to permit the tilting to take place. For this purpose the member 3 is provided at circumferentially spaced locations (at three of them in the illustrated embodiment, as seen FIG. 2) with lugs 4a', 4b' and 4c', respectively. The member 6 in turn is provided with similarly circumferentially spaced lugs 4a'', 4b'' and 4c'', respectively. There are further provided contraction springs 4a, 4b and 4c each of which has its opposite ends connected to two cooperating lugs. Thus, the spring 4b which is visible in FIG. 1 has its opposite ends connected to the lug 4b' and the lug 4b'', respectively. Thus, the annular member 6 is retained on the member 3 but with sufficient freedom of tilting movement so as to accommodate itself to circumstances where either the pipe 1 or the wall having the inlet I might be inclined relative to one another, that is a situation in which the longitudinal axis of the pipe 1 might be skew with reference to the central axis of the inlet I. In such a situation the annular member 6 can pivot or tilt relative to the tubular member 3 so as to be in proper surface-to-surface contact with the wall of the oven O, whereby a proper tight emission-preventing engagement of the member 6 with this wall is assured. The member 3 is additionally provided with two or more pins, projections or bolts 7a, and appropriate manipulative devices of the supply unit (not illustrated, because they are known per se in the art) can engage these bolts 7a, 7b in order to raise or lower the terminal section 3 in accordance with the double-headed arrow shown in FIG. 1.

It will be appreciated that with the present invention it is possible to provide for filling of the oven O without having to accept any undesirable emissions which might take place during such filling, either from the pipe 1 or from the inlet I.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in a coking oven, it is not intended

to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. In an oven, particularly a coking oven, a combination comprising wall means having an inlet through which material is to be admitted into said oven; supply means for supplying material to be so admitted; a filler pipe having a lower end portion and extending downwardly from said supply means toward said inlet in substantial registry therewith when said supply means is located above said inlet; and a terminal section on said lower end portion for tightly connecting the interior of said filler pipe with said inlet, said terminal section comprising a tubular member coaxial with said lower end portion, projecting from and being surrounded by the same and having a part-spherical free lower end, sealing means between and in sealing engagement with said terminal section and said lower end portion; an annular member located downwardly adjacent the lower end and having a surface in mating engagement with said part-spherical free lower end so that said annular member is tiltable relative to said tubular member said lower end portion and said annular member being provided with respective angularly spaced connecting lugs; and spring means connecting said annular member with said tubular member, comprising contraction springs extending axially of said filler pipe and each having opposite end portions which are respectively connected to one of said lugs on said pipe and one of said lugs on said annular member.

2. A combination as defined in claim 1, wherein said sealing means comprises sealing rings of sealing material.

3. A combination as defined in claim 2, wherein said sealing material is selected from a group composed of teflon (TM), hard rubber, asbestos, and graphite.

4. A combination as defined in claim 2, wherein said sealing material is graphite-asbestos cord.

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