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(54) CLOSURE FOR A HORIZONTAL COKE OVEN CHAMBER

(71) We, G. WOLFF JR. KOMMANDITGESELLSCHAFT, of No. 877, Hattinger Strasse, 463 Bochum-Linden, Federal Republic of Germany, a limited partnership organised under the Laws of the Federal [illegible] do hereby declare

[illegible] frame and thus creates the required seal.

When the door frame and the body of the door of this known closure undergoes dimensional changes due to the high temperature fluctuations that occur in service and the edge of the metal band which was originally pressed tightly against the sealing face of the frame lifts away from this face, then the tightness of the seal can be restored by striking the back edge of the band with a hammer. These hammer blows push the metal band back into sealing contact with the sealing face. The ease with which the seal can be re-established and adapted to any thermal distortion and warping of the frame and the door simply by striking the back of the strip a number of blows with a hammer constitutes the special advantage this type of closure affords.

Nevertheless, this convenient closure which forms a metal-to-metal seal is still [illegible] kept in resilient contact with the sealing face on the door frame by spring means. However, these closures have the drawback that the displacement of the spring-loaded thrust members and hence of the sealing frame itself is restricted to the length of the springs, and that a perfect seal may not be achieved even when the sealing frame is pressed against the door frame for the first time. Furthermore, the springs often tend to slacken when temperatures rise so that a resilient spring-mounted construction calls for a considerable expenditure in accessory means. The mannipulation of

ERRATUM

SPECIFICATION NO 1568601

Page 7, lines 48 to 63, *delete whole lines insert* ing suitably shaped to function as a dripping point.

14. A closure according to Claim 13, formed with a projection at that part or edge of the frame which is situated furthest outwards.

15. A closure according to any one of Claims 8 to 14, in which parts of the body of the door facing the door frame are rebated substantially conformably with the frame.

16. A closure according to any one of Claims 8 to 14, comprising a door frame provided in the region between its edge defining the door opening and its sealing face with at least one groove extending parallel.

THE PATENT OFFICE
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the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a closure for a horizontal coke oven chamber, comprising an integral door frame attached to the head of the oven chamber and provided on its outside with a sealing face extending around its circumference, a door tightenable against said frame and, frictionally attached to the door by clamping elements a metal band which can be forced edgewise against the sealing face when the door is closed thereby to seal the interior of the oven chamber.

It is already known in such an oven chamber closure to provide a frame formed by the metal band of which one side bears against the body of the door, whereas the edge facing the frame has a sharp bevel cut edge. This sharp edge is forced into contact with the sealing face on the door frame and thus creates the required seal.

When the door frame and the body of the door of this known closure undergoes dimensional changes due to the high temperature fluctuations that occur in service and the edge of the metal band which was originally pressed tightly against the sealing face of the frame lifts away from this face, then the tightness of the seal can be restored by striking the back edge of the band with a hammer. These hammer blows push the metal band back into sealing contact with the sealing face. The ease with which the seal can be re-established and adapted to any thermal distortion and warping of the frame and the door simply by striking the back of the strip a number of blows with a hammer constitutes the special advantage this type of closure affords.

Nevertheless, this convenient closure which forms a metal-to-metal seal is still not entirely satisfactory because the geometrical shape of the door frame and of the door undergoes continuous change due to the incessant major temperature fluctuations that occur in the course of a coking cycle. A lasting seal for sealing the interior of the oven chamber cannot therefore be achieved by occasionally driving the metal band forwards with a hammer by hand. In order to ensure the creation of a perfect seal for the entire duration of a coking cycle the metal band would have to be repositioned repeatedly, a requirement that could not be met in actual practice. These observations apply with particular force to coke oven chambers of major height as are now being erected on an increasing scale.

In other types of closures for oven chambers, designers have sought to provide a seal which endures notwithstanding dimensional changes of door frame and door by substituting for the metal band which is attached to the door by friction, a metal band in the form of a frame which is kept in resilient contact with the sealing face on the door frame by spring means. However, these closures have the drawback that the displacement of the spring-loaded thrust members and hence of the sealing frame itself is restricted to the length of the springs, and that a perfect seal may not be achieved even when the sealing frame is pressed against the door frame for the first time. Furthermore, the springs often tend to slacken when temperatures rise so that a resilient spring-mounted construction calls for a considerable expenditure in accessory means. The mannipulation of

such closures therefore makes high demands upon the skill of attendant personnel.

It is therefore an object of the present invention to provide a closure for an oven chamber which, like the first hereinabove described type of closure, avails itself of an easily displaceable metal band, since this permits major thermal distortions of the door frame and door to be taken up easily, but which is also so contrived that minor dimensional changes can be automatically absorbed and the tightness of the seal thus preserved, with the elimination of the need for a continuous readjustment of the metal band. At the same time it is contemplated to minimise the cost of the closure and to make it safe and easy to handle.

According to the present invention this object is achieved by forming the edge of the metal band facing the door frame with fitting lugs projecting towards the sealing face and distributed at intervals around the periphery of the frame, said edge and the fitting lugs being inserted into a continuous slot in a sealing cord made of elastic material which can be pressed against the sealing face on the door frame, the base of the slot in the sealing cord containing openings for the reception of said fitting lugs in a tight grip, which openings have a height exceeding the height of the lugs.

In such a closure the major thermal distortions of the door frame and door can be easily compensated by driving the metal band that is frictionally fitted to the door by striking the back of the band with a hammer. At the same time the continuous minor dimensional changes of door frame and door, such as occur during operation of the oven chamber, can be absorbed by the elastically yielding sealing cord and thus automatically compensated.

An automatic compensation of these minor dimensional changes is achieved by making the height of the openings in the bottom of the slot for the reception of the fitting lugs greater than the height of the fitting lugs themselves. Consequently contact between the free edge of the metal band and the sealing face on the door frame results in the sealing cord being precompressed and this permits the sealing cord thereafter to adapt itself to movements that usually occur during the coking cycle, and to maintain a tight seal.

Moreover, the fitting lugs on the metal band also offer an advantage in another respect. First of all they keep the sealing cord secure on the metal band but, above and beyond that, they also prevent the sealing cord from being damaged or even destroyed when the metal band is struck with a hammer. Finally they enable the cord to be evenly and uniformly precompressed around the entire periphery of frame and door.

The protection afforded the sealing cord against damage, particularly against being split during the application of hammer blows to the back of the band, is due to the fact that the fitting lugs are distributed at intervals around the entire periphery of the door so that they prevent the metal band from making direct contact with the sealing face of the door frame with the sole exception of the localised parts where the fitting lugs are formed. Hence the sealing cord cannot be damaged even in the event of the fitting lugs having already been driven into direct contact with the sealing face and further hammer blows are applied quite unnecessarily to the bands. The shocks due to the blows are transmitted by the fitting lugs directly to the door frame without causing additional stresses or strains on the cord. Consequently the attendant wielding the hammer need not be particularly sensitive nor need he exhibit special skill. On the other hand, a particular degree of pre-compression that is uniform all round the periphery can be applied to the cord merely by pushing the fitting lugs into contact with the sealing face.

In order to ensure the creation of a perfect seal it is desirable that the metal band and the sealing cord should form an endless sealing element extending around the periphery of the body of the door. On the other hand, the sealing cord will be particularly safely attached to the metal band and its lugs if the latter have a substantially Vee-shaped dovetail contour in the plane of the metal band. In such a case the sealing cord can also be easily detached from the metal band and its lugs, when it has performed a useful period of service and a fresh sealing cord is to be affixed in its place.

In the further development of the invention the closure may comprise a divided door frame consisting of an inner frame member surrounding the oven chamber opening and an outer frame member which adjoins the inner member with the interposition of a heat insulation, such as an asbestos gasket, and which bears the sealing face for cooperation with the sealing cord. In such a door frame the sealing face will not assume as high a temperature as would be the case in an undivided frame. This permits materials possessing a major degree of elasticity to be used for making the sealing cord. The automatic compensation of dimensional changes of the door frame and of the door and hence the maintenance of a good seal for keeping the oven chamber interior tight will be the more effective the greater the elasticity of the

cord. The outer member of the door frame is preferably so designed that its outer face is not wider than necessary to form the sealing face and that the member is thin compared with the overall thickness of the door frame, since this will then also assist in keeping down the temperature of the door frame in the neighbourhood of its sealing face.

The proposed closure for an oven chamber may also comprise, alongside the metal band and substantially parallel thereto on the side facing the opening defined by the door frame, a sharp-edged metal sealing frame which is attached to the body of the door and adapted when the door is closed to be advanced towards and its sharp edge forced against the sealing face of the door frame.

The tightness of the closure for sealing the interior of the oven chamber may be impaired not only by distortion and dimensional changes of the door frame and the door but also by the formation of incrustations which may be deposited during the coking cycle on parts of the closure, particularly on the sealing face of the door frame, and which will then prevent the seals from making tight sealing contact with the cooperating surfaces on the door frame. These incrustations arise because a considerable degree of condensation of tar and pitch contained in the volatised products of distillation may occur on colder parts of the closure and these liquid condensates will then harden and solidify.

In the described conventional closure of the contemplated type the formation of incrustations does not present a major problem because the metal band is forced into contact with the sealing faces when the band is driven into contact with the door frame, and any incrustations present between the sealing faces and the sharp edged metal band are easily cut and broken away. However, since in the present instance the hammer blows drive only the fitting lugs into contact with the sealing face, the incrustations are not destroyed to the same extent when the band is driven home with a hammer. Therefore if the present closure is required to maintain a good seal throughout a plurality of coking cycles without requiring the sealing faces and the sealing cord to be specially dressed off and cleaned, a process which is not only time-consuming, but also subjects the sealing faces and the sealing cord to severe wear, steps may be necessary to prevent the formation of such incrustations in the neighbourhood of the sealing faces altogether. If this is done the sealing cord will require replacement only at major service intervals.

The sealing faces of the door frame and the sealing cord will keep free from incrustations even after a large number of coking cycles if at least the bottom and sides of the door frame are repeatedly rebated and thus form steps normal to the oven axis on the outside between the edge defining the door opening and the sealing face, the sealing face being set back respectively recessed further inwards than the section which projects furthest outwards between the door opening and the sealing face. If the door frame is thus rebated it is best from the production point of view to arrange for the rebates to extend around the entire circumference of the door frame.

In a door frame of such a kind the steps formed in its outside surface by the rebates present a major obstacle to the penetration of condensates from the door opening into the neighbourhood of the sealing face and the sealing cord. This obstacle is particularly effective at the bottom and at the lower parts of the sides of the frame and door because the edge of the step formed by each rebate also functions as a dripping edge. The rebated region between the door frame and the body of the door therefore represents a barrier and a trap for retaining condensates.

At the bottom and particularly across the bottom of the frame and the door the presence of the steps formed by the rebates also results in condensates that have formed near the edge defining the door opening dripping off by gravity when at the end of a coking cycle the door is withdrawn and then for a while remains open, the condensates being thus removed without trickling down the sealing faces of the frame with the risk of adhering thereto and being retained. This also applies when the coke oven is exposed to wind blowing on the door frame.

If the seal is at the same time a two-part seal comprising a closed sealing frame on the inside of the metal band facing the door opening, then the proposed consecutive rebating results in such a frame and its associated sealing surfaces being likewise protected from condensation.

It is desirable that the door frame should be formed with at least three consecutive step-forming rebates between its edge defining the door opening and its sealing face, four such rebates being preferred.

Condensates will be kept away from the sealing face of the door frame and from the sealing cord if a step formed by a rebate nearer the door opening defined by the frame is at a more elevated level than the step formed by the next rebate towards the sealing face. In such a case wetting of the sealing faces when the door is and has been withdrawn at the end of a coking cycle will be further suppressed.

In order to assist the condensates from

dripping off under their own weight the door frame may be provided at least at the bottom of the door opening with an outward projection extending substantially in a direction normal to the oven chamber axis, said projection being suitably shaped to function as a dripping point. Preferably this projection should be on that part or edge of the frame which extends furthest outwards.

Another useful step consists in providing those parts of the body of the door which face the door frame with rebates which substantially conform with those on the frame. Door and frame will then together define a narrow gap in the rebated region and the steps formed by the rebates of the door will provide additional obstacles preventing condensation from appearing on the sealing face and the sealing cord.

Even more effective protection against condensation is afforded the sealing face and the sealing cord in a closure comprising a door frame provided in the region between its edge defining the door opening and its sealing face with at least one groove extending parallel to the steps formed by consecutive rebates. More particularly the groove should be provided preferably on that side of a step which faces away from the opening defined by the frame. If then a portion of the door projects into at least one such groove in the frame it will define a labyrinth seal between the door and the frame and further suppress and tendency for condensates to form on the sealing face and the sealing cord.

Yet another step that can be taken to reduce condensation on the sealing face and the sealing cord consists in inserting one or more peripheral, substantially channel-section metal strips between the frame and the door in the rebated region. These metal strips are capable of completely excluding the formation of condensates in regions that are critical for the maintenance of a tight oven chamber seal.

Conveniently the metal strips are detachably insertable. They can then be easily replaced when the door is open should they prove to have been fouled by condensates or incrustations. It is also best to make the metal strips of a spring material since this will permit the strips by virtue of their inherent elasticity to maintain contact with both components of the closure when the door frame and the door itself tend to undergo dimensional changes caused by the heat. Finally, it is preferred that these metal strips extend across the bottom edges and up each side of the door frame and door.

With advantage the channel-section metal strips are so inserted between frame and door that the web of the strips bears against the door and the edges of the flanges bear against the frame. However, the shielding effect for the protection of the sealing face and the metal band will be most effective if the web of the strips is received into a groove in the frame and the edge of one flange bears against the door frame and the edge of the other flange against the body of the door.

A preferred material for making the sealing cord is one based on silicone rubber.

In order that the nature of the invention may be more readily understood five embodiments will now be more particularly described purely by way of example and reference made to the accompanying diagrammatic drawings, in which:

Fig. 1 is a front elevation of a first embodiment of an oven closure according to the invention;

Fig. 2 is a part sectional side elevation on the line II-II of the oven closure shown in Fig. 1;

Figs 3 and 4 are horizontal sections of the oven chamber closure in Figs 1 and 2, the sections being taken on the lines III-III and IV-IV respectively in Fig. 1;

Fig. 5 is a part of a metal band inserted into a sealing cord which is not yet compressed;

Fig. 6 is the metal band and the sealing cord of Fig. 5 in a section taken on the line VI-VI in Fig. 5;

Fig. 7 is the metal band and the sealing cord of Figs 5 and 6 in a section taken on the line VI-VI in Fig. 5, showing the sealing cord pre-compressed;

Figs. 8, 9, 10 and 11 are each a fragmentary section on a larger scale of a second, third, fourth and fifth embodiment of an oven chamber closure according to the invention.

With reference to the drawings a closure at the head of a horizontal coke oven chamber, not shown, comprises a cast iron integral door frame 1 covering the oven head, a door 2 made of grey or spherical cast iron and adapted to be tightly pressed against the frame 1, and a peripheral seal 3 which is attached to the body of the door 2.

The door frame 1 comprises a bottom and a top transverse portion 1*a* and two side portions 1*b*. Moreover, the frame is peripherally divided, consisting of an inner frame member 1α defining the door opening 4 into the oven chamber and an outer frame member 1β which is attached to the inner member 1α with the interposition of an asbestos gasket 5. The outer frame member 1β is provided on the outside 6 with a sealing face 7 extending around its entire periphery, and the thickness a_2 of this member is small compared with the total thickness a_1 of the door frame 1.

Generally speaking the door 2 is substantially U-shaped and comprises a main panel 8 covering the door opening 4 and two outwardly projecting flanges 9. The back of the panel 8 facing the chamber interior is provided with skirtings 10 for locating and holding refractory brickwork 11 arranged to project into the opening 4 of the door frame 1 like a plug.

Moreover, the body of the door 2 can be pulled tight against the frame by two closing mechanisms which are merely generally indicated in Figs 1 and 2, whereas Figs 3 and 4 illustrate one of these mechanisms in greater detail. Each closing mechanism comprises a deflectable bar 12 which enables the door to be resiliently tightened by thrust generating means 14 and which is attached to bar holders 13 secured to the sides of the door frame 1.

The seal 3 is an endless metal band 15 which embraces the circumference of the door 2, and which is mounted for horizontal displacement towards the frame. The seal further comprises an integral endless sealing cord 16 of elastic material which likewise extends around the periphery and can be pressed against the sealing face 7 of the door frame 1. Along its edge facing the door frame the metal band 15 is formed with fitting lugs 17 which in the plane of the band have a Vee-shaped dovetail contour, as will be understood from Fig. 5.

The sealing cord 16 contains a continuous longitudinal slot 18. he base 19 of this slot in the sealing cord 16 contains openings 20 of a height b_2 exceeding the height b_1 of the fitting lugs 17. The edge of the fitting lugs 17. The edge of the metal band 15 formed with the lugs 17 is inserted into the slot 18 in the sealing cord 16, the fitting lugs 17 themselves entering the openings 20 which grip them tightly.

The metal band 15 is frictionally held on the sides of the flanges 9 of the body of the door 2. For this purpose the flanges 9 contain holes distributed around the periphery of the door for the reception of bolts 21, of which some have a head in the form of a cross piece retainer 22, whereas others are formed with a cam disc 23, a clamping plate 24, and a control knob 25. At each bolt 21 the sealing band 15 is therefore tightly pressed against the outside of the flange 9 either by a retainer 22 or by a clamping plate 24. The periphery of each cam 23 has the shape of part of a spiral encircling the axis of the associated bolt 21 as its centre.

When the body of the door 2 has been pulled tight on the door frame 1 and located, the sealing cord 16 is pressed against the sealing face 7 of the door frame 1 to form a seal. For this purpose the back of the metal band 15 is struck with a hammer at points around its periphery and the band 15 together with the sealing cord 16 is thereby driven up against the sealing face. The hammer blows are continued until the fitting lugs 17 firmly bear on the sealing face 7 of the door frame 1. When this is the case the sealing cord 16 will have been compressed with an even amount of pre-compression around the entire periphery.

Should now the door frame 1 and the door 2 expand and contract as a result of the changing temperatures during the coking cycle, then minor distortion of the door frame and of the door can be absorbed by the sealing cord 16. Owing to its pre-compression the sealing cord 16 will maintain sealing contact with the sealing face 7 for as long as the door 2 at the point in question does not pull away from the frame 1 by more than the distance b_3, being the difference between the heights b_2 and b_1 of the base 19 of the slot and of the fitting lugs 17. On the other hand, major thermal dimensional changes of frame 1 and door 2 can be compensated and the tightness of the seal maintained by driving the sealing band 15 towards the sealing face by subjecting it to renewed hammer blows. If the back of the sealing band 15 had originally made contact with the cam 23 when the body 2 of the door was first pulled tight against the door frame 1, then these hammer blows will move the sealing band 15 away from the cam 23. In order to restore contact between the back of the sealing band 15 and the cams 23 and thereby to locate the band in its fresh position, the control heads 25 can be turned until the desired contact is re-established. The direction of rotation is indicated in Fig. 11 by an arrow X.

In the first embodiment shown in Figs 1 to 4 the inner frame member 1α of the door frame 1 is externally completely flat. In the other illustrated four embodiments shown in Figs 8 to 11 this inner frame member 1α is provided around its entire circumference between the edge defining the door opening 4 and the sealing face 7 with a rebated configuration forming consecutive steps in a direction normal to the oven axis indicated by an arrow Y. The door frame thus constitutes a repeatedly rebated frame. In this region the frame 1 and the body of the door 2 between them define a condensate sealing and trapping chamber. Moreover, in all the embodiments two to five the sealing face 7 of the door frame 1 is also set back respectively countersunk in relation to the extreme outward edge 26 of of the door frame.

In each case the rebated door frame 1 contains four consecutive rebates 27 on the

outside between its edge defining the door opening 4 and its sealing face 7. These are indicated by joint leading lines in Figs 8, 9, 10 and 11. The rebates are so contrived that consecutive rebates 27 in a direction away from the door opening 4 defined by the frame 1 are also progressively more deeply recessed.

Furthermore, across the bottom and up the lower portions of the sides of the frame 1 and the door 2 in each of the embodiments in Figs 8 to 11, the door frame is provided at the door opening 4 with an outwardly projecting finger 28 forming a dripping point extending in a direction normal to the oven axis Y. In each of the several embodiments this projection 28 is located at the extreme edge 26 of the door frame 1 defining the door opening 4.

In the case of the second, third, fourth and fifth embodiments the portions of the body of the door 2 facing the frame 1 are rebated substantially to conform with the rebating of the frame 1, so that the gap width between the frame 1 and the door 2 is substantially constant and uniform throughout the rebated region.

Moreover, in the region between the edge defining the opening 4 and the sealing face 7 the illustrated door frame 1 contains two grooves 29 parallel to the edges 27*a* of steps formed by the rebates 27. These grooves 29 are formed adjacent the rebate 27 nearest the sealing face 7 and most remote from the edge defining the door opening 4, and the grooves extend around the entire periphery of the frame. Moreover, the body of the door 2 is arranged to project into the groove 29 which is nearest the door opening 4 and thus to define a kind of labyrinth sealing gap.

In the third, fourth and fifth embodiments shown in Figs 9, 10 and 11 detachable roughly channel-section spring metal strips 30 are inserted in the peripheral direction between the rebated portions of the door frame 1 and the body of the door 2. These metal strips 30 are arranged to extend down each side and the bottom of the frame 1 and the door 2.

In the third and fourth embodiments shown in Figs 9 and 10 the web 31 of the channel-section strip 30 is received into the bottom of the groove 29 nearest the door opening 4, whereas in both cases the edge of one flange 32 of the strip 30 bears against the door frame 1 and the edge of the other flange against the body of the door 2. In the third embodiment shown in Fig. 9 the edge of one flange bears on a face of the panel 8 of the door which is normal to the oven axis Y, whereas in the fourth embodiment in Fig. 10 it bears on a face of the panel 8 of the door that is parallel to the oven axis and thus makes contact in the lengthwise direction of the oven chamber. In the fifth embodiment in Fig. 11 the web 31 of the metal strip 30 is supported by the panel 8 of the door 2, whereas the edges of the flanges 32 bear against the frame 1. In this instance the flanges 32 extend in the longitudinal direction of the oven chamber and the web 31 extends transversely thereto.

Certain features of the closures described herein with reference to the drawings are also disclosed in, and included in the claims of, our co-pending Application No. 1609/77 (Serial No. 1 568 602) to which reference should be had.

WHAT WE CLAIM IS:—

1. A closure for a horizontal coke oven chamber, comprising an integral door frame attached to the head of the oven chamber and provided on its outside with a sealing face extending around its circumference, a door tightenable against said frame and, frictionally attached to the door by clamping elements a metal band which can be forced edgewise against the sealing face when the door is closed thereby to seal the interior of the oven chamber, so contrived that the edge of the metal band facing the door frame is formed with fitting lugs projecting towards the sealing face and distributed at intervals around the periphery of the frame, said edge and the fitting lugs being inserted into a continuous slot in a sealing cord made of elastic material which can be pressed against the sealing face on the door frame, the base of the slot in the sealing cord containing openings for the reception of said fitting lugs in a tight grip, which openings have a height exceeding the height of the lugs.

2. A closure according to Claim 1, wherein the metal band and the sealing cord form an endless sealing element around the periphery of the body of the door.

3. A closure according to Claim 1 or 2, wherein the fitting lugs have a substantially Vee-shaped dovetail contour in the plane of the metal band.

4. A closure according to Claim 1, 2 or 3, comprising a divided door frame consisting of an inner frame member surrounding the oven chamber opening and an outer frame member which adjoins the inner member with the interposition of heat insulation, and which bears the sealing face for cooperation with the sealing cord.

5. A closure according to claim 4 wherein said heat insulation is in the form of an asbestos gasket.

6. A closure according to Claim 4, or claim 5, comprising an outer frame member having an outer face which is not wider than necessary to form the sealing face and which is relatively thin compared with the

overall thickness of the door frame.

7. A closure according to any one of Claims 1 to 6, comprising, alongside the metal band and substantially parallel thereto on the side facing the opening defined by the door frame, a sharp-edged metal sealing frame which is attached to the body of the door and adapted when the door is closed to be advanced towards and its sharp edge forced against the sealing face of the door frame.

8. A closure according to any one of Claims 1 to 7, wherein at least the bottom and sides of the door frame are repeatedly rebated and thus form steps normal to the oven axis on the outside between the edge defining the door opening and the sealing face, the sealing face being set back respectively recessed further inwards than the section which projects furthest outwards between the door opening and the sealing face.

9. A closure according to Claim 8, wherein the rebates extend around the entire circumference of the door frame.

10. A closure according to Claim 8 or 9, wherein the door frame is formed with at least three consecutive step-forming rebates between its edge defining the door opening and its sealing face.

11. A closure according to Claim 8, 9 or 10, wherein the door frame is formed with four consecutive step-forming rebates between its edge defining the door opening and its sealing face.

12. A closure according to any one of Claims 8 to 11, whereas a step formed by a rebate nearer the opening defined by the frame is at a higher level than the step formed by the next rebate towards the sealing face.

13. A closure according to any one of Claims 8 to 12, wherein the door frame is provided at least at the bottom of the door opening with an outward projection extending substantially in a direction normal to the oven chamber axis, said projection being suitably shaped to function as a drip-ping point.

14. A closure according to Claim 13, formed with a projection at that part or edge of the frame which is situated furthest outwards.

15. A closure according to any one of Claims 8 to 14, in which parts of the body of the door facing the door frame are rebated substantially conformably with the frame.

16. A closure according to any one of Claims 8 to 14, comprising a door frame provided in the region between its edge defining the door opening and its sealing face with at least one groove extending parallel to the steps formed by consecutive rebates.

17. A closure according to Claim 16, wherein each groove is located on the side of a step which faces away from the opening defined by the frame.

18. A closure according to Claim 16 or 17, wherein each groove is arranged to extend around the entire periphery of the frame.

19. A closure according to Claim 16, 17 or 18, wherein a portion of the door projects into at least one of the grooves and thus defines a labyrinth sealing gap.

20. A closure according to any one of Claims 8 to 19, comprising one or more substantially channel-section metal strips inserted between the frame and the door in the rebated region and extending in the peripheral direction of frame and door.

21. A closure according to Claim 20, wherein the metal strips are detachably insertable.

22. A closure according to Claim 20 or 21, comprising metal strips made of spring material.

23. A closure according to Claim 20, 21 or 22, wherein the metal strips extend across the bottom edges and up each side of the door frame and door.

24. A closure according to Claims 20 to 23, wherein the web of the channel-section metal strips bears against the door and the edges of the flanges bear against the frame.

25. A closure according to any one of Claims 20 to 23, wherein the web of the strips is received into a groove in the frame and the edge of one flange bears against the door frame and the edge of the other flange against the body of the door.

26. A closure according to any one of the preceding Claims, wherein the sealing cord is made of silicone rubber.

27. A closure according to claim 1 for a horizontal coke oven chamber, substantially as herein described with reference to and as illustrated by the accompanying drawings.

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1568601 COMPLETE SPECIFICATION

4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

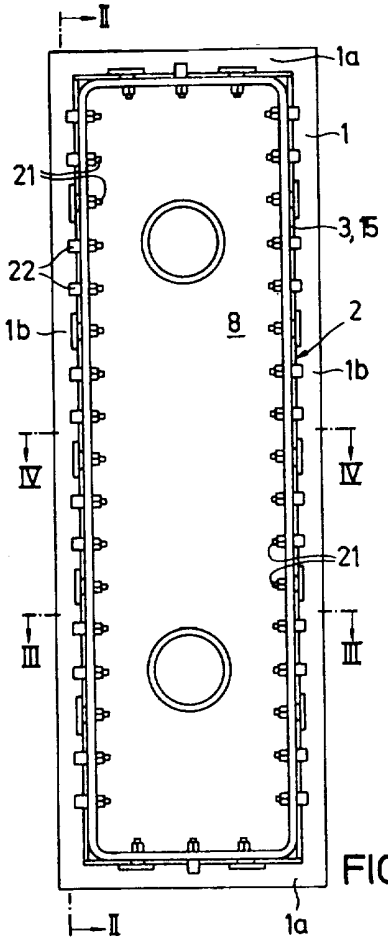


FIG. 1

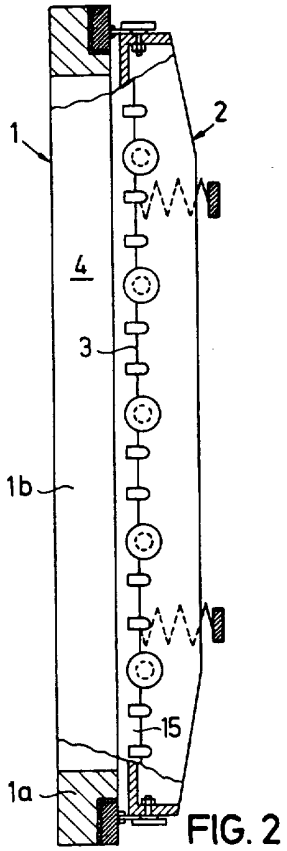


FIG. 2

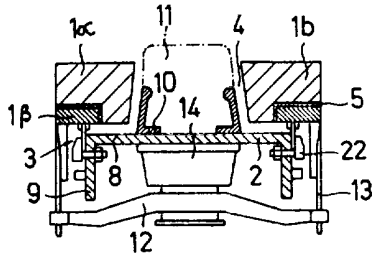


FIG. 3

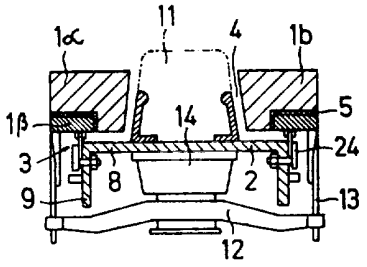


FIG. 4

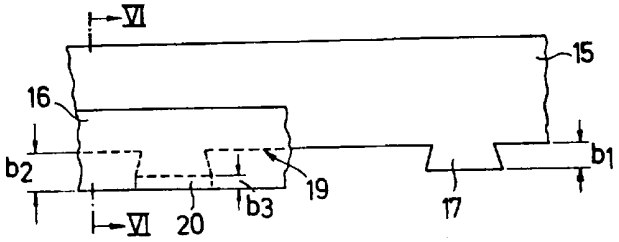


FIG. 5

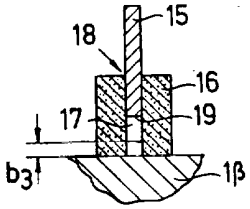


FIG. 6

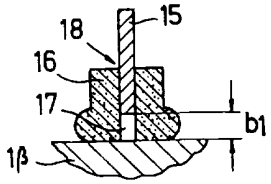


FIG. 7

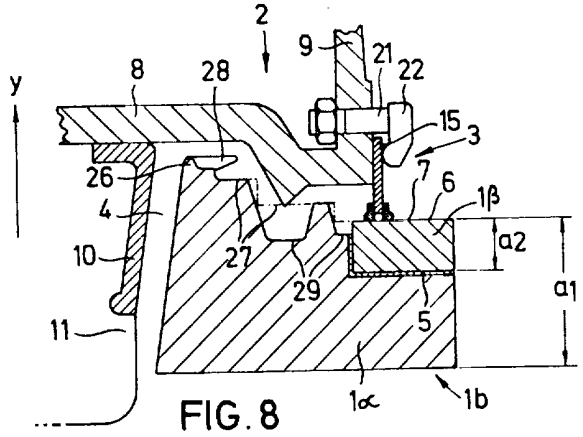
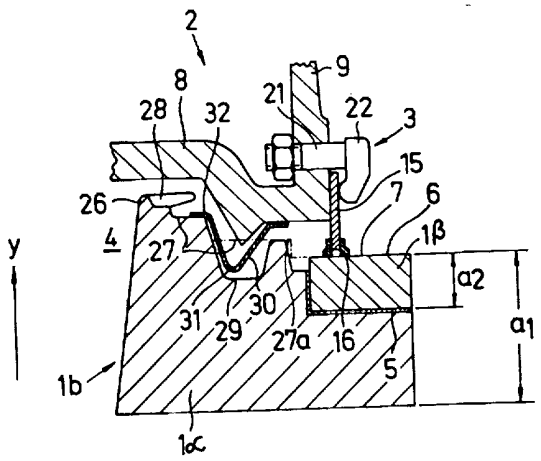


FIG. 8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21
9
22
3
15
7
6
1β
26
4
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27a
16
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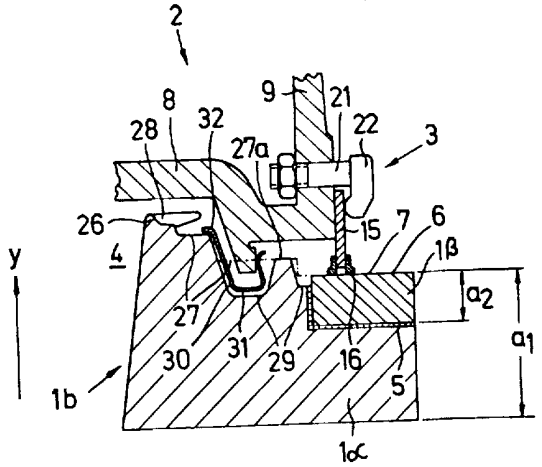
a2
a1
1b
1α

FIG. 9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a1
1b
1α

FIG. 10

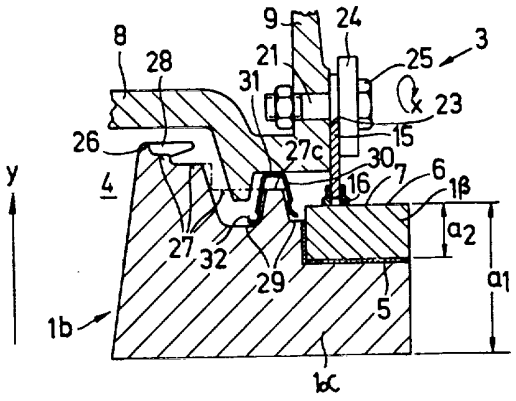

FIG. 11