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Calderon

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[54] **COKE OVEN DOOR WITH HEAT SETTABLE SEALANT**

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[51] **Int. Cl.**...**C10b 25/06,** C10b 25/12, C10b 25/16

[58] **Field of Search** ..... 202/248, 247, 269; 110/173 R

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Assistant Examiner—David Edwards

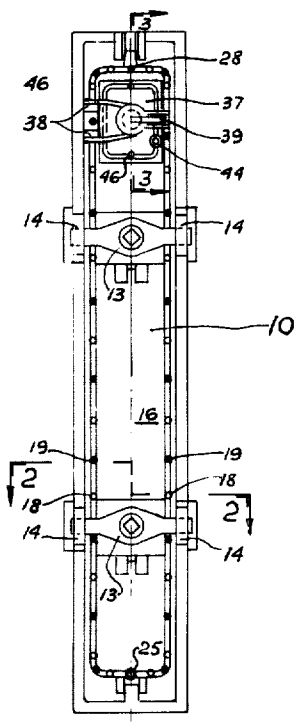
[57] **ABSTRACT**

An improved method and apparatus for by-product coke oven operation wherein the problems of pollution caused by gases leaking through coke oven doors during the coking cycle are eliminated by providing a door having a passage for the injection of a special material to serve as a positive seal between the door and the jamb of the oven to plug the crevices through which gases escape. The material injected possesses fludized properties during injection in order to fill the space between the door and jamb and upon the baking thereof it solidifies and hardens with a glazed-like surface in order to make possible the removal of this material after the completion of the coking cycle without the necessity of cleaning the door and jamb. In preventing gases from escaping the coke oven the pollution problem is eliminated and the following advantages ensue:

a. No fires occur at the doors, the outside framework is thus protected.
b. No air is infilterated into the oven thereby minimizing carbon deposits.
c. The oven walls near the doors remain warmer during the coking cycle.
d. The brick work near the oven doors is not subjected to excessive cooling thereby minimizing maintenance on oven ends.
e. Warpage of door jambs on high ovens is minimized.

The improved method and apparatus is adaptable to existing facilities without difficulty and without stopping productivity.

24 Claims, 9 Drawing Figures



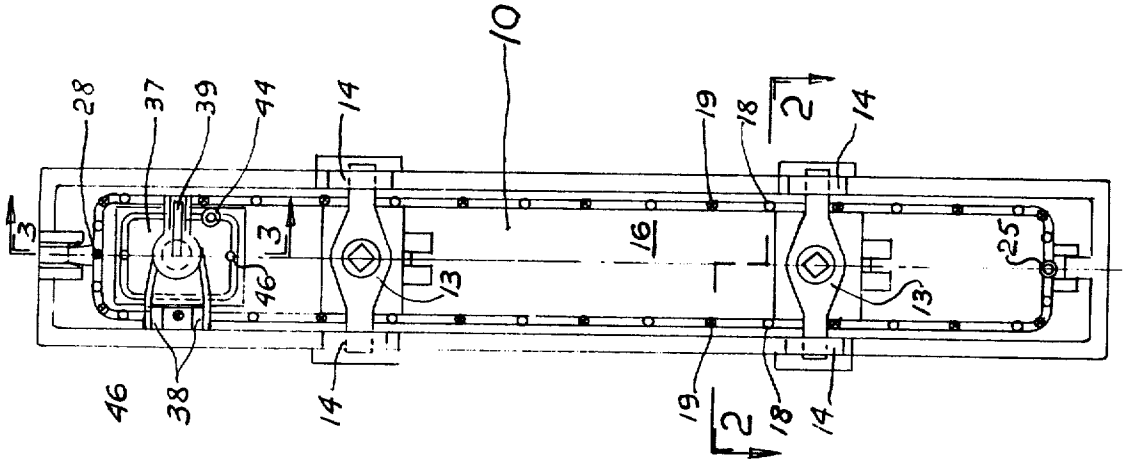


FIG. 1

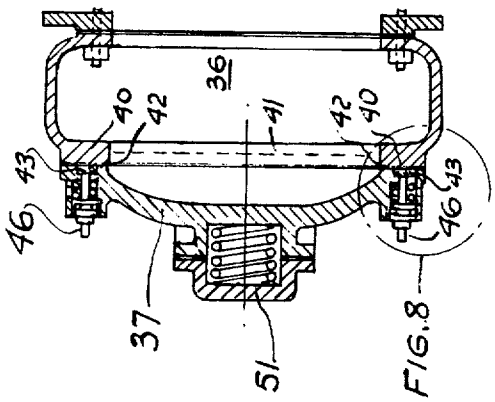


FIG. 3

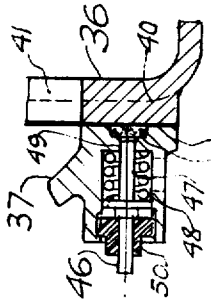


FIG. 8

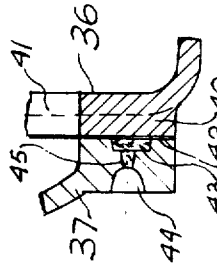


FIG. 9

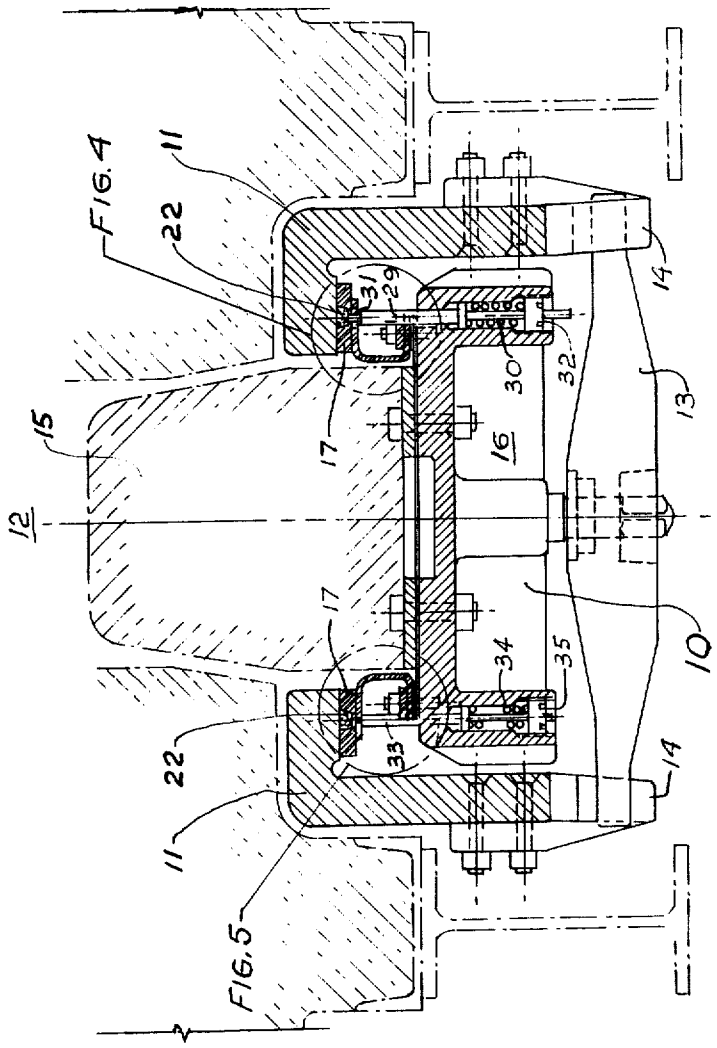


FIG. 2

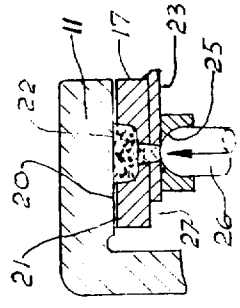


FIG. 7

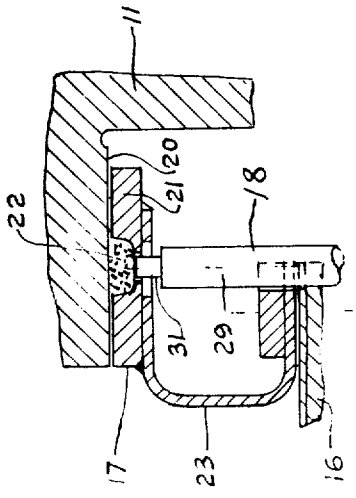


FIG. 4

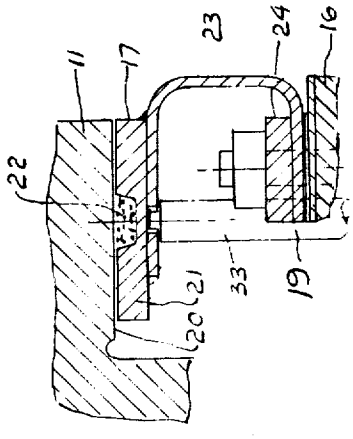


FIG. 5

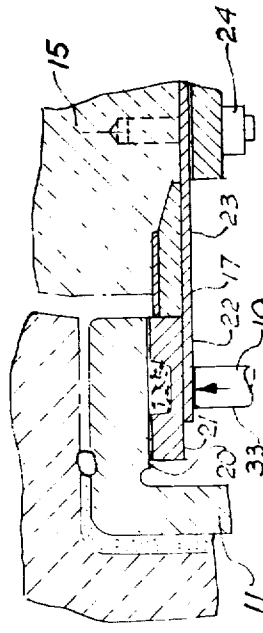


FIG. 6

FIG. 5

COKE OVEN DOOR WITH HEAT SETTABLE SEALANT

The present invention relates to an improved method and apparatus for sealing the doors of by-product ovens of the type commonly used for the commercial production of coke.

In the art of making coke in a by-product oven which is one of many ovens situated side by side in battery form, the coal is charged by means of a charging car through apertures or holes in the roof and the coke is heated indirectly by means of heated refractory walls which in turn are heated by the burning of fuel. During the baking or the "cooking" which lasts about 17 hours, by-product gases evolving from the coal leave the oven by means of an ascension pipe which delivers these gases into a collecting main which connects the battery of ovens to the by-product coke plant where these gases which are rich in chemicals are processed. The battery of ovens has two sides, the pusher side and the coke side and each oven has two doors, one on the pusher side and one on the coke side. Each of the said doors is secured to the oven by means of locks, generally two, one at the top and one at the bottom which locks are put in tension to press the door against the door jamb of the oven. Because of thermal conditions, structural members at the oven end and particularly at joints of doors and jambs accumulate deposits of carbon caused by the condensation of leaking gases which turn into tar that carbonizes. Further, the deformation of the jambs and door seals permit coal fines to occupy crevices between the jamb and the door; these fines when heated cause a serious pollution problem in the form of gas leakage. In order to prevent leakage of gases during the coking cycle and particularly during the initial stages of coking, two methods have been employed to seal the door to the jamb:

a. The luting procedure, and

b. The mechanical seal

The luting procedure which is pretty much obsolete comprises the preparation of a mud-like mixture made up of clay, boiler ashes and water, which is trowelled after the mounting of the door on the oven end around the periphery of the door from the outside, and also using a second narrow trowel to stuff the mud between door and jamb to plug crevices. The reasons for discontinuing this procedure are the following:

i. The job is messy as the mixture tends to slump upon application on the vertical portions of the jambs and great quantities of mud must be used.

ii. The application is done manually in very uncomfortable working conditions and relatively takes too long since the oven cannot be charged until the luting operation is completed.

iii. It is inconvenient to elevate the mixture to the workers.

iv. Qualified labor for such a job where noxious gases are breathed persistently is hard to find.

v. Upon removal of the door a dusty pollution problem is caused by the crumbling of the dried mixture.

vi. The dried mud on the door and door jamb must be scraped manually by using long flat scrapers while the oven ends are open. This is very difficult particularly in high ovens since the jambs exceed 20 feet in height. Because of this difficulty, doors and door jambs are left unattended causing a bigger problem of re-sealing when the doors are reseated at the oven ends.

In order to eliminate this luting problem various schemes were devised by developing "self-sealing" doors. In this country the two most commonly used are the Koppers design and the Wilputte design. Both designs possess a thin strip or ring in the door which is spring loaded for adjustment. This strip bears against a machined surface on the jamb. The principle of sealing comprises the bearing of this strip in close contact with the jamb with only a few thousandths of an inch for clearance. It has been accepted that if the door jamb and the sealing strip of the door are clean and there is no deformation of the door jamb and or sealing strip, a seal can be obtained several minutes after charging caused by the carbonization of the tar which tar condenses from the leaking gases. In practice the sealing strips have not been successful because of the following reasons:

a. They are too flimsy for such a rugged operation. They tend to easily deform.

b. The door jambs tend to bow.

c. Cleaning of door strips and door jambs is very difficult.

d. The principle of sealing by means of strips of rings is strictly dependent on leakage of gases which principle is polluting per se.

e. The filling of coal fines in the vicinity of the strip invites the build-up of deposits which makes it difficult to reseal.

Attempts have been made to solve the problem of cleaning deposits on door strips or rings and jambs by devising a cleaning apparatus using vibrating knives or scrapers on a chain mounted on modern coke pushers and door extracting machines. This equipment is of great magnitude and even though it has been only partially successful because it has required a lot of maintenance, the problem of installing such cleaning equipment on existing pushers or door machines is impractical. Further the time taken to clean doors and jambs has been a detriment to the productive capabilities of the machines. It takes around three minutes to clean a door and a jamb in a pushing cycle of about 9 minutes per oven. Also the flimsiness of the strips and the bowing of the jambs have gone unanswered. It is well known that all coke oven plants are suffering from excessive manpower expenditure in cleaning, adjusting and replacing door sealing strips. Doors on the pusher side possess a secondary aperture equipped with a closure, in the upper portion of the door, commonly known as the leveling door. The "sealing" of this leveling door is supposed to be accomplished by pressing a sharp edge of the closure against a machined surface surrounding said aperture. This has not worked in practice. Whether sealing doors by luting or sealing by a strip or ring the problem of leakage through oven doors and leveling doors has persistently continued.

The instant invention provides the following:

i. A method of sealing the coke oven doors as well as the leveling doors.

ii. An improved coke oven door that will positively prevent gases from leaking.

iii. A system of converting existing doors so they do not leak.

iv. An injectable material that will close crevices so gases are prevented from escaping between the oven jamb and door.

With the above factors in view the main object of this invention is to provide a method which will prevent the cause of leakage of gases from the oven doors as well as the leveling doors, this cause of leakage being tar build-up between door and jamb during the coking cycle making it very difficult to reseal once the door is removed for the push. This method generally comprises the injection of a sealing material between door and jamb to seal all crevices and prevent gases from leaving the oven.

Another object of the present invention is the method of introducing into the oven door a sealing material to possess a fluidized property for injection, a sticky and gummy property upon heating for sealing and a hardening non-crumbling property upon dehydration for elimination of dust generation when removed.

Further another important object of this invention is the imparting to said material a non-wetting and glazed-like surface finish upon hardening in order to facilitate the removal of the sealing material after the completion of the coking cycle.

Yet another object of this invention comprises the method of imparting properties to said material that upon hardening said material will separate from the door and jamb of the coke oven leaving the surfaces of said door and jamb clean to obviate the necessity of cleaning said door and jamb.

Yet it is another object of this invention to provide a method wherein gases from the oven are prevented from leaking by providing a positive seal which seal is easily removed without the necessity of cleaning said door and jamb of the coke oven without leaving deposits stuck to said door and jamb, this being accomplished by the injection of sealing material between said door and jamb before charging the oven with coal and thereby preventing coal to occupy the space between said door and jamb.

It is still another object of this invention to provide an improved coke oven door wherein a passage is provided between the door and the jamb for the injection of a positive seal.

Further still another object of the present invention is to provide an improved coke oven door having a groove to mate with the door jamb of said oven, said groove having a passage to receive a sealing material injected into said door and fill said groove.

Further yet another object of this invention is to provide an improved coke oven door having a groove with a draft to facilitate the ejection of the sealing material injected after said door is removed from the coke oven.

It is further yet the object of this invention to provide an improved coke oven door having a passage for the injection of a sealing material, said door having ejection pins to push out the hardened sealing material from said groove after the removal of the door at the completion of the coking cycle.

Therefore another object of this invention is the provision of an improved coke oven door having a spring loaded passage block for the receiving of injectable sealing material for the sealing of said door to the jamb of the coke oven, said spring feature being provided for adjustment in order to accommodate warpage caused by heat.

It is therefore another object of the instant invention to provide a method of converting existing doors to possess a passage for the injection of a sealing material and prevent gases from leaking from conventional coke oven doors.

Therefore, yet another object of this invention is the provision of a sealing passage attached to conventional coke oven doors for converting them to receive the injection of a sealing material to prevent leakage during coking.

It is therefore yet another object of this invention to provide a sealing material ameanable for injection between the coke oven door and jamb which is made up of a filler, a binder and a carrier and which is adapted to seal crevices and is easy to remove after the extraction of said door from the oven.

It is also another important object of this invention to make said material comprise sand, starch and water, the sand being the filler, the starch the binder and the water the carrier, said sand, starch and water being mixed in such proportions as to be fluid for injection, sticky upon heating for sealing crevices and hard with a glazed-like surface finish upon baking for ease of removal without crumbling.

Yet also another object of this invention is to provide an improved coke oven door having a leveling door adapted to receive injectable sealing material to seal said leveling door to said oven door.

It is yet also another object of this invention to provide a leveling door with a passage into which a sealing material is injected in order to seal said leveling door to the coke oven door.

Other objects of this invention will appear from the following detailed description and appended claims reference is made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in their various views.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a front elevation representation of coke oven door and jamb; the locks and leveling door also being shown.

FIG. **2** is a section taken at **2—2** of FIG. **1.** It shows the oven jambs and door in section and the passage for the sealing material.

FIG. **3** is a section taken at **3—3** of FIG. **1.** It shows a sectional view of the leveling door with the passage for the sealing material.

FIG. **4** is an enlarged view of the sealing passage of the door shown in FIG. **2,** showing also the ejection pin.

FIG. **5** is an enlarged view of the sealing passage of the door shown in FIG. **2,** showing also the adjustment screw.

FIG. **6** is an enlarged view of the sealing passage as adapted to a Wilputte door design.

FIG. **7** is a representation showing the point at which the sealing material is injected into the passage of the oven door.

FIG. **8** is an enlarged view showing the ejection pin arrangement for the leveling door shown in section by FIG. **3.**

FIG. **9** is a representation showing the point at which the sealing material is injected into the passage of the leveling door.

Before explaining in detail the present invention, it is to be understood that the invention is not limited to its application to the details of construction and arrangement of the parts illustrated in the accompanying drawings since the invention is capable of other embodi-

ment. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not limitation.

DETAILED DESCRIPTION OF DRAWINGS:

In FIG. 1, reference numeral **10** indicates the coke oven door and **11** represents the coke oven door jamb. Door **10** is removeable and jamb **11** is fixed to the oven shown by numeral **12.** Door **10** generally possesses two locks, numeral **13,** one being located at the top and one at the bottom; locks **13** engage against lugs **14** which lugs are fastened to jamb **11,** to press door **10** against jamb **11.** This pressing action can be accomplished either by screw action or by spring means.

Door **10** is mainly made up of refractory plug **15,** cast-body **16** and sealing block **17.** Through body **16,** a plurality of spring loaded pins are mounted; these pins are preferably of two types; namely, spring loaded ejection pin shown by numeral **18** and spring loaded adjustment pin shown by numeral **19.** Sealing block **17** comprises machined surface **21,** passage or groove **22** and diaphragm **23.** Jamb **11** possesses machine surface **20** against which machined surface **21** of block **17** bears. It is preferred to have passage **22** in block **17,** but this does not mean that passage **22** cannot be provided in jamb **11,** or passage **22** partially be in block **17** and partially in jamb **11.** The reason for preferring to have passage **22** in block **17** is because conventional doors can be converted without stopping productivity.

Sealing block **17** is secured to cast-body **16** by means of diaphragm **23** which diaphragm can assume any suitable shape as for example a U-shape as shown of FIGS. **2, 4** and **5** or a straight-shape as shown by FIG. **6.** Diaphragm **23** is fastened to cast-body **16** by nut and bolt assembly **24.** Sealing block **17** which is rectangular-shaped and which circumscribes the periphery of door **10,** matches rectangular-shaped jamb **11** with contact being between machined surfaces **20** and **21.** Door **10** possesses introducing or injection point **25,** preferably at the bottom thereof shown in FIG. **1** and enlarged in FIG. **7.** Injector tip **26** which is part of injecting apparatus not covered in this application is used to introduce sealing material to be described hereinafter in detail. The injecting apparatus just referred to will be covered by a separate application.

Since jamb **11** deforms because of thermal conditions adjustment pins **19** are provided at various intervals as shown by FIG. **1;** these pins work on a screw principle to adjust sealing block **17** in relation to jamb **11** in order to minimize the gap between machined surface **20** of jamb **11** and surface **21** of sealing block **17.** Adjustment pin **19** comprises shank **33,** spring **34** and pressure cap **35.**

Passage **22** is continuous and preferably communicates with injection point **25** at the bottom of door **10.** The sealing material to be described is injected into tapered orifice **27** reaching passage **22.** The sealing material, preferably by means of pressure, is injected to fill passage **22** and leak out from discharge orifice **28** at the top of door **10.** The injecting from the bottom of door **10** and leaking out from the top of door **10** insures the filling of passage **22** with the sealing material. Ejection pin **18** comprises shank **29,** spring **30,** knock-out **31** and extension **32.** After the removal of door **10** at the termination of the coking cycle, extensions **32** of ejection pins **18** hit a mechanical stop (not shown) pushing knock-outs **31** into passage **22** and thereby eject the solidified and baked sealing material. A plurality of ejection pins **18** are spaced in door **10** for complete and balanced ejection.

In FIGS. **1** and **3,** numeral **36** represents the leveling door and numeral **37** the closure therefor; hinges **38** and latch **39** are provided to closure **37** so that it can swing sideways for leveling the coal during and just after charging. Leveling door **36** possesses machined surface **40** around aperture **41,** and closure **37** has machined surface **42** around its closing periphery. Machined surface **40** mates with machined surface **42.** Passage **43** is provided to closure **37** for receiving said sealing material to be described, through injection point **44** using tapered orifice **45;** this sealing operation takes place after the leveling door is closed at the completion of the leveling of the coal. Ejection pins **46** are used to eject the said sealing material after the coking cycle and before the subsequent leveling operation. Ejection pin **46** comprises shank **47,** spring **48,** knock-out **49** and cap **50.** Closure **37** is equipped with adjusting pressure means **51** which can be in the form of a wheel or spring arrangement as shown.

The sealing material is made-up of a filler, a binder and a carrier. The filler can be any suitable material as for example sand, clay, silica, metal oxides and any mixture thereof. The binder can be any suitable material as for example, starch, polyvinyl alcohol, gelatinous polymers and any mixture thereof. The carrier can be any suitable liquid as for example water, alcohols, ethers, ketones, hydro-carbon solvents and any mixture thereof.

In practice it has been found that a mixture of sand, starch and water in the right proportions gives very good results. The colloidal mixture mixes well with negligeable settlement of the ingredients and its fluidity makes it easy to pump therefore suitable for injection. Upon application of heat by the door and jamb, the material becomes gummy and sticky making it practical for sealing crevices between the door and jamb. Upon the de-hydration of the material caused by the baking action during the coking cycle the material develops non-wetting properties and non-adhering properties by hardening to a strong solid mass holding itself together and having a glazed-like surface finish, and maintaining the shape of passage **22** which in practice serves as a mold or matrix for the material. The surface of the material after having a glazed-like surface finish is conducive for easy removal from passage **22** leaving no residue on machined surfaces **20** of jamb **11** and **21** of sealing block **17.** The material further possesses the property of oozing out of passage **22** between surfaces **20** and **21** and becoming gummy making it possible to seal any crevices. Upon solidification the gumminess of the material disappears and fins develop between surfaces **20** and **21,** which easily part from surfaces **20** and **21.** To enhance the parting properties of the material, graphite may be added. If the material is to be shipped wet, an anti-freeze additive may be included in the mixture to withstand changes in the weather. The proportions of the sand, starch and water were found to be 12.5 lbs. of fine sand, 2.5 lbs. of starch and 1 gallon of water. The sand and starch were first mixed dry and the water was gradually added stirring the mixture until a uniform colloidal material resulted. The above mixture in the proportions mentioned appears to be most suitable for the application of the instant invention.

OPERATION

While the operation of the method and apparatus of the present invention may be comprehended from a study of the foregoing description, it is believed that the operation may be further explained as hereinafter set forth.

Referring to the FIGURES enumerated above, assuming that door **10** is locked in position by locks **13** bearing against lugs **14.** An injecting means such as a pumping mechanism (not shown) engages into injection point **25** at the bottom of door **10,** and forces said sealing material into passage **22.** As said material is injected, it fills passage **22** and at the same time oozes out the crevices between jamb **11** and door **10,** thereby sealing them. When said sealing material reaches the top of door **10,** the material runs out discharge opening **28** indicating that passage **22** has been filled. Since jamb **11** reaches a temperature of about 400°F. and door **10** about 200°F., said material starts heating up immediately making it gummy and sticky to form a dam or seal within the crevices.

At the conclusion of filling passage **22** which should not be more than several seconds, the oven is ready to be charged. After the charging is completed which means that the leveling of the coal is also accomplished since the leveling takes place during charging, passage **43** of leveling door closure **37,** is also filled with said sealing material by injecting it through injection point **44.** This is done on door **10** on the pusher side since leveling door **36** is provided. If a secondary door similar to leveling door **36** is provided on the coke side for gas evacuation during charging as proposed in the said copending applications of the inventor then the main door similar to door **10** and the secondary door similar to leveling door **36** are sealed by injecting said sealing material. During the coking cycle gases from the oven cannot escape between door **10** and jamb **11** and between leveling door **36** and closure **37** because the sealing material injected fills all crevices and prevents oven gases from leaving the oven.

As heating continues the moisture in said sealing material is driven off gradually thereby baking said material in passages **22** and **43.** This baking action solidifies and hardens said sealing material which assumes the shape of passages **22** and **43** as if these passages were molds. Further the baking action gives a glaze to the surface of said material upon hardening with the result that said material will not adhere to either jamb **11** or block **17.** At the conclusion of the coking cycle which lasts about 17 hours, door **10** is extracted by door extracting mechanism (not shown) and said material parts and separates from machined surface **20** of jamb **11,** the sealing material being held in block **17** of door **10.** At the end of the retracted stroke of door extracting mechanism away from oven **12,** ejecting pins **18** are automatically actuated to push said sealing material out of passage **22** without any sealing material adhering to sealing block **17.** Preferably the molded sealing material falls into a container provided for this purpose to eliminate pollution of solids around the ovens. After the push, the door is in condition to be re-hung on the oven and resealed as explained above. Once this is accomplished leveling door closure **37** is swung open for leveling, and as this is done ejecting pins **46** are automatically actuated to eject the solified and surface-glazes sealing material from closure **37.** After the leveling of the coal is accomplished during charging, closure **37** is closed and resealed by injection as also explained above.

By providing an improved door capable of receiving a sealing material which is fluid enough for injection, gummy enough for sealing crevices upon heating and non-adhering upon de-hydration for ease of removal, several important results are obtained:

a. Gases are prevented from leaving the ovens.
b. No cleaning of doors and jambs is necessary.
c. There is no air infiltration into the ovens.
d. No fires burn from doors.
e. Warpage of jambs is greatly reduced.
f. Refractories at oven ends have longer life.
g. Savings in manpower result.
h. Operating costs are reduced.

In the United States there is in excess of 200 batteries averaging 50 ovens per battery making a total of about 10,000 ovens and since each oven has two doors the sum aggregates to 20,000 doors in use. It is not conceivable to replace these doors and therefore, it is the intention of this invention to adapt the method, apparatus and material described herein to application in conjunction with existing doors.

All in all it is submitted that the present invention provides an improved method for controlling pollution caused from door leakage, improved apparatus and material for accomplishing same.

I claim:

1. In a coke oven having a door movable between an open position and a closed position for opening and closing a portion of said oven, a first surface on the jamb of said oven, a door frame having a second surface, said first and second surfaces being suitably dimensioned so that when said door is in its closed position said surfaces lie substantially adjacent one another, conduit means for transporting sealant material, said conduit means being formed in at least one of said surfaces and opening toward the other surface, an inlet opening in said second surface and connected in fluid communication with said conduit means, heat settable sealant material, means for introducing said heat settable sealant material into said inlet opening, and means for removing sealant material from the conduit means upon movement of said door to the open position.

2. In a coke oven as set forth in claim **1,** wherein said means for introducing the heat settable sealant material into said inlet opening is adapted to apply sufficient pressure to the heat settable sealant material so that the said heat settable sealant material will be transported through the conduit means and forced into any crevices between the said first and second surfaces, thereby forming a gasket-like seal therebetween.

3. In a coke oven as set forth in claim **1,** wherein said conduit means are formed in said second surface.

4. In a coke oven as set forth in claim **3,** wherein said removal means are supported by said door frame.

5. In a coke oven as set forth in claim **4,** wherein said removal means includes a removal member and means for pushing said removal member into said conduit means.

6. In a coke oven comprising a jamb frame having a first surface around its periphery, a door frame having a second surface around its periphery, said first and second surfaces conforming generally in shape and dimension so that when said jamb frame and said door frame are engaged said first and second surfaces will lie

generally adjacent one another, a conduit formed in at least one of said surfaces and being open toward the other surface when said surfaces are adjacent one another, an inlet opening in said second surface communicating with said conduit, means for urging said first and second surfaces against one another, and heat settable sealant material which is transported by said conduit and which fills a substantial portion of the crevices between said surfaces to thereby form a gasket-like seal therebetween.

7. In a coke oven as set forth in claim **6**, means for separating said first and second surfaces.

8. In a coke oven as set forth in claim **6**, wherein said coke oven is of the type having a plurality of ports, at least one of which is adapted to be closed by a main door, said door frame being secured to said main door.

9. In a coke oven as set forth in claim **8** wherein at least one of said ports is adapted to be closed by a leveling door.

10. In a coke oven as set forth in claim **7**, removal means communicating with said conduit for removing said heat settable sealant material from said conduit upon separation of the said surfaces.

11. In a coke oven as set forth in claim **10**, wherein said rmeoval means are carried by said door frame.

12. In a coke oven as set forth in claim **11**, wherein said removal means includes an ejection passageway in said second surface.

13. In a coke oven as set forth in claim **12**, wherein said removal means further includes a plunger and means for driving said plunger through said ejection passageway and into said conduit.

14. A door for closing a portion of a coke oven having a first surface means, said door comprising a frame having second surface means, means for urging said second surface means toward said first surface means when said door is used to close the portion of the oven, a heat settable sealant material, means for injecting said heat settable sealant material between said first and second surface means, said means for injecting said heat settable sealant material between said first and second surface means includes an inlet opening in fluid communication with at least one of said surface means, and means for directing the heat settable sealant material through said inlet opening, whereby said heat settable sealant material may fill crevices between said surfaces and thereby form a gasket-like seal therebetween.

15. A door for closing a portion of a coke oven as set forth in claim **14**, wherein said heat settable sealant material is directed through said inlet opening under pressure and is thereby forced into the crevices between the said surface means.

16. A door for closing a portion of a coke oven having a first surface, said door comprising a frame having a second surface, heat settable sealant material adhered to said second surface, said sealant material being disposed between said first and second surfaces when the door is used to close the said portion of the oven, means for automatically moving the sealant material away from said second surface upon opening of the oven door, said means for automatically moving said sealant material includes a removal member and means for pressing said removal member against said sealant material upon opening of said door.

17. A door as set forth in claim **16**, wherein said oven is of the type having a plurality of ports, wherein said door comprises a main door for closing at least one of said ports.

18. A door as set forth in claim **17**, wherein at least one of said ports is closed by a leveling door.

19. A door for closing a portion of a coke oven as set forth in claim **16** wherein said removal member is supported by said door frame.

20. A door for closing a portion of a coke oven having a first surface, said door comprising a frame having a second surface, said second surface including conduit means opening toward said first surface when said frame is urged toward said oven, said conduit means receiving a fluid sealant disposed in engagement with said first and second surfaces, stationary heat settable fluid sealant means disposed in sealing engagement with said first and second surfaces, said stationary fluid sealant means comprising a colloidal solution.

21. A door for closing a portion of a coke oven as set forth in claim **20** wherein said colloidal solution comprises a carrier material, a binder material and a filler material.

22. In a coke oven having a door movable between an open position and a closed position for opening and closing a portion of said oven, said oven being of the type having a jamb which includes a first surface, a sealing member adapted to be secured to the door, said sealing member including conduit means for transporting sealant material, said sealing member further including a sealing surface located so as to lie adjacent said first surface of the jam when the door is in its closed position, an inlet opening in said sealing member in fluid communication with said conduit means, heat settable sealant material, and means for introducing the heat settable sealant material into said inlet opening.

23. In a coke oven as set forth by claim **22**, wherein said conduit means includes openings for receiving a means for removing sealant material from said conduit upon movement of said door to the open position.

24. In a coke oven having a door moveable between an open position and a closed position for opening and closing a portion of said oven, said oven being of the type having a jamb including a first surface, said door having a second surface, said first and second surfaces being suitably dimensioned so that when said door is in its closed position said surfaces lie substantially adjacent one another, a conduit means for transporting sealant material, said conduit means being secured to at least one of said surfaces and opening toward the other surface, an inlet opening in at least one of said surfaces and in fluid communication with said conduit means, heat settable sealant material, means for introducing said heat settable sealant material into said inlet opening, said conduit means having openings for receiving a means for removing sealant material from the conduit means upon movement of the door to the open position.

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