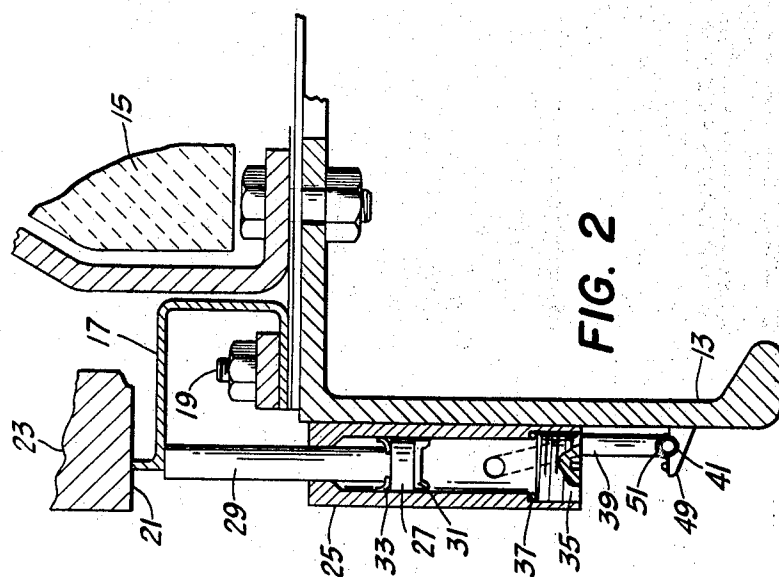
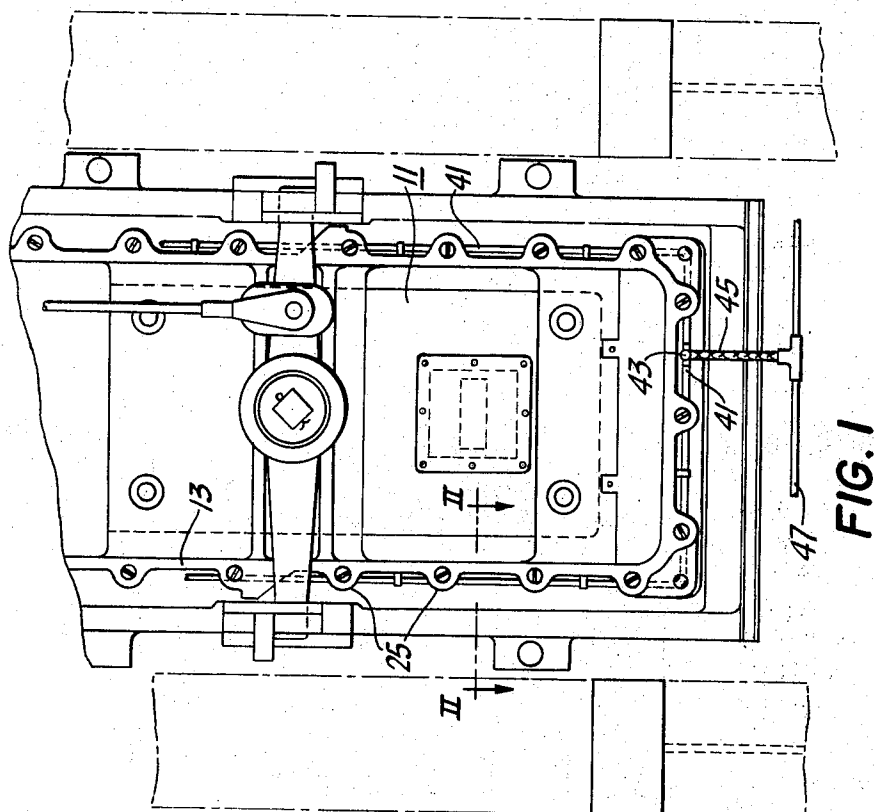


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APPARATUS FOR APPLYING THRUST TO THE
KNIFE EDGE OF A COKE OVEN DOOR
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1

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APPARATUS FOR APPLYING THRUST TO THE KNIFE EDGE OF A COKE OVEN DOOR

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4 Claims

ABSTRACT OF THE DISCLOSURE

Fluid pressure, such as air, is applied to a plurality of pistons having rods that coact with and urge a flexible knife edge into ultimate sealing contact with the door jamb of a coke oven chamber. Each door is provided with a fluid header connected to cylinders in which the pistons operate, and the fluid header of each door connects to a main header extending along the coke oven battery.

BRIEF SUMMARY OF THE INVENTION

A coke oven door is provided with a plurality of cylinder-piston assemblies having rods that coact with the sealing ring. A header, capable of carrying fluid under pressure is mounted to the door and conduits connect the header to each assembly. A conduit carrying such fluid under pressure is mounted to the battery with conduits connecting each header. Valve means is provided in each conduit to control the flow of fluid from the conduit on the battery.

For a further understanding of my invention and for features and advantages thereof, reference may be made to the following description and the drawing which illustrates a preferred embodiment of equipment in accordance with my invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is a vertical front elevational view of the lower portion of a coke oven door incorporating an embodiment of my invention; and

FIG. 2 is a view along line II--II of FIG. 1.

DETAILED DESCRIPTION

Referring to FIGS. 1 and 2, a conventional coke oven door 11 is provided with a bulb angle door frame 13 to which are secured a conventional door plug 15, and a flexible sealing ring 17. The sealing ring is secured, as by studs 19, to the door frame 13 and contacts a conventional seating surface 21 of a door jamb 23.

To the door frame 13 there are secured a plurality of regularly spaced apart cylinder-piston assemblies 25. Within each assembly 25 is a piston 27 with an outwardly extending piston rod 29 that engages the sealing ring 17, as shown in FIG. 2. The piston 27 is provided with a heat resistant cup seal 31 on one side and an annular heat resistant dust seal 33 on the piston rod side and surrounding the piston rod 29.

The free end of the cylinder portion of the assembly 25 is threaded to receive a screw plug 35 that engages a conventional O-ring 37, as shown in FIG. 2. The cylinder-piston assembly 25 is provided with a tubular conduit 39 which connects to a tubular header 41 that encircles the perimeter of the door 11, as shown in FIG. 1.

At the bottom of the door 11, there is a T-fitting 43 in the tubular header 41 and one portion of a Snap-Tite quick disconnect fitting 43 is secured to the header 41; the disconnect fitting 43 is a conventional fitting made by Snap-Tite, Inc. of Union City, Pennsylvania, and marketed under the trademark Snap-Tite. Those skilled in the art

2

will understand that any other suitable type of fitting may be used if such is preferred.

A length of flexible hose 45 which carries a mating portion of the Snap-Tite coupling is secured at one end to a main fluid conduit 47 that extends along the length of the coke oven battery at a location below the bottom of all doors on the battery. Fluid under pressure, such as air, is carried in such conduit 47.

A suitable support 49 and removable clamp 51 is provided at strategic locations on the door frame 13 for supporting the tubular header 41, as shown in FIG. 1.

In operation, it will be assumed for the purpose of this description that an oven has been pushed and that both oven doors have been replaced and relatched. The benchman would then connect the flexible hose 45 to the fitting 43 whereby, immediately, the header 41 is also pressurized with air. The pressurized air in the header 41 exerts equal pressure on all pistons 27 which move toward and exert equal force on the sealing ring 17. Thus, the door is sealed for charging and during coking of coal in the oven.

When the oven is to be pushed, the benchman manually disconnects the flexible hose from the fitting and immediately the air pressure in the header drops to ambient pressure. The Snap-Tite fitting is so made that when it is disconnected, a valve in the portion connected to the flexible hose closes and prevents fluid, such as air, from escaping. When connection is made to the other portion of the fitting attached to the header on the door, the valve opens automatically, thereby admitting fluid to flow through the connection into the header. Fluid pressure in the door header creates equal pressure on the pistons and on the sealing knife edge.

From the foregoing description of one embodiment of the invention, those skilled in the art should recognize many important features and advantages of it, among which the following are particularly significant:

That the force applied by the several pistons of each door against the knife edge sealing ring is always constant and of a known value; whereas, in prior art devices which utilize springs in such cylinder-piston assemblies, the forces exerted by the springs are not equal;

That the conventional door latching mechanism can be simplified because no work is required for latching and unlatching against spring exerted thrust against the door jamb since there is no force exerted against the sealing ring until after the door is latched and no force is exerted against the sealing ring when unlatching takes place;

That flexure of the sealing ring is greatly reduced each time the door is removed and replaced when compared to the flexure experienced with doors fitted with conventional spring plungers; and

That, in some instances, the fluid connection, that is suggested as being manually accomplished herein, may be made automatically.

Although the invention has been described herein with a certain degree of particularity it is understood that the present disclosure has been made only as an example and that the scope of the invention is defined by what is hereinafter claimed.

What is claimed is:

1. In a coke oven door of a battery having a flexible knife edge sealing ring around its periphery for engagement with a door jamb, the improvement comprising:

(a) a plurality of cylinder-piston assemblies mounted to the frame portion of said door in such a way that a piston rod projecting from each of the said assemblies is adapted to coact with said sealing ring when said door is latched in place;

(b) means for exerting uniform equal fluid pressure on each one of said pistons rods, whereby said piston

3

rod urges said sealing ring against said door jamb in a sealing relationship.

2. The invention of Claim 1 wherein:

- (a) said means includes a fluid conducting header capable of carrying fluid under pressure mounted to said door with fluid conduits connected to each of said assemblies. 5

3. The invention of Claim 2 including:

- (a) a conduit carrying said fluid under pressure mounted to said battery;

- (b) fluid conducting means for connecting said conduit on said battery and said header on said door; and 10

- (c) valve means for controlling the flow of such fluid from said conduit on said battery.

4. In a coke oven door of a battery having a flexible knife edge sealing ring around its periphery for engagement with a door jamb, the improvement comprising: 15

- (a) a plurality of cylinder-piston assemblies mounted to the frame portion of said door in such a way that a piston rod projecting from each of the said assemblies is adapted to coact with said sealing ring when said door is latched in place; 20

4

- (b) a header capable of carrying fluid under pressure mounted to said door with fluid conduits connected to said assemblies;

- (c) a conduit carrying said fluid under pressure mounted to said battery;

- (d) fluid conducting means for connecting said conduit on said battery and said header on said door; and

- (e) valve means for controlling the flow of such fluid from said conduit on said battery.

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