June 21, 1949. L. W. JILLSON 2,473,710

ROTARY DRIER SEAL

Filed March 16, 1945

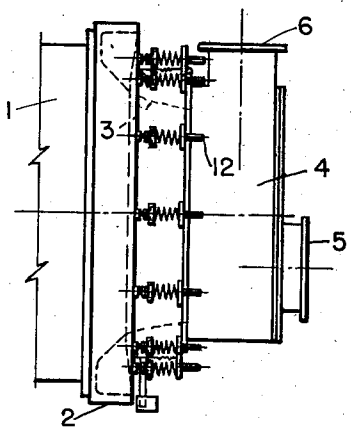


FIG. 1

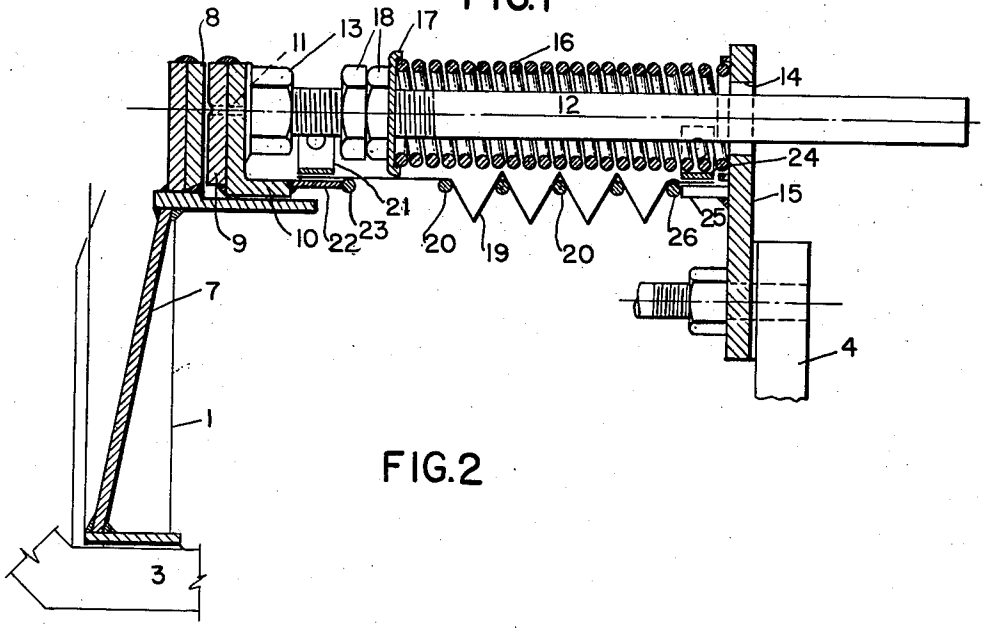


FIG. 2

INVENTOR.
Lyman W. Jillson

BY William R. Day ATTORNEY

Patented June 21, 1949 2,473,710

UNITED STATES PATENT OFFICE

2,473,710

ROTARY DRIER SEAL

Lyman W. Jillson, Detroit, Mich., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich., a corporation of Michigan

Application March 16, 1945, Serial No. 583,074

2 Claims. (Cl. 285—10)

1

The present invention relates to a novel improvement in rotary dryers, furnaces, kilns, and the like; and the primary objective thereof is to provide means for sealing the joint between the rotating cylindrical shell of the dryer, furnace or kiln and the stationary end housing.

In heat transferring devices of this type, and due to the necessary operating conditions, the provision of a seal between the fixed and moving elements, i. e. the shell and the housing, respectively, has constituted a real problem in the art. Due to expansion and contraction, warpage, wear and variation in temperature and in weight of the charge, it is a practical impossibility to make or maintain a tight machined joint between these parts. Acordingly, my present invention provides a sealing means which is capable of accommodating itself to the expansion, contraction, warpage and the like, while at the same time maintaining an efficient seal between the fixed and moving parts of the rotary dryer or furnace. It will be apparent to those skilled in the art, that the provision of such a seal is of great advantage in that it enhances the heat efficiency of the dryer or the furnace, aids in recovery of valuable gases, prevents dilution of said gases by infiltration of air and also contributes to human health and safety in preventing the escape to the atmosphere of hot air, gases and dust particles of the material being handled.

To the accomplishment of the foregoing and related ends and to enable any person skilled in the art readily to understand and practice the invention, the following full and concise description and annexed drawing set forth the best mode in which I have contemplated applying the principle thereof.

Fig. 1 is an elevational view of one end of a rotary dryer, furnace or kiln, and showing the sealing means of my invention as assembled on the joint between the rotary shell and the stationary end housing; and

Fig. 2 is an enlarged, sectional, detailed view showing the structure of the sealing means.

Now referring more particularly to the drawing, the cylindrical shell 1 of the rotary dryer, furnace or kiln, being customarily mounted upon the tire 2 adjacent to its end, has an intake mouth 3 entrant into the interior of the stationary end housing 4. Inlets or exits, as indicated at 5 and 6, are provided in the housing 4 for the introduction of the material which is to be passed through the rotary shell 1 for drying or heating treatment, and for the outlet of recovered gases.

A circular plate 7 is welded on the outside of

2

the mouth 3 of the shell 1 and supports at its outer edge the radial bearing ring 8. A second bearing ring 9 is mounted adjacent to the ring 8 and adapted to bear against it. In Figure 2 the ring 8 is shown not quite in contact with the ring 9, thus illustrating the slight amount of axial movement that these two rings have with respect to each other. The ring 9 is preferably welded to a second ring 10 of angular cross section. Suitable lubricating bores 11 are provided around the rings 9 and 10 in order to permit the periodical introduction of lubricant between the faces of the rings 8 and 9.

Circumferentially spaced studs 12 are mounted upon the ring 10 such as by having their heads 13 welded thereto. The studs 12 project through enlarged holes 14 in the radial flange 15 carried by the housing 4. Each of the studs 12 are spring-loaded by a compression spring 16 which abuts at one end against the flange 15 and at the other end against the collar washer 17 which is held in adjustable position by means of the lock nuts 18 on the stud 12.

A flexible fabric bellows or tube 19, radially supported at intervals throughout its length by means of the wire rings 20 is attached at one end by means of the clamping ring 21 to the flange extension 22 of the ring 10. A ring 23 is welded against the end of the end flange 22 so that when the clamp 21 is drawn tight, the end of the fabric sleeve 19 is effectively held and sealed onto the flange 22. In the annexed drawing, the parts 21, 19 and 22 are shown in slightly spaced apart relationship, and prior to the tightening of the ring clamp 21, in order to better illustrate the assembly and last described clamping action.

The other or right hand end of the fabric tube 19 is similarly clamped by means of the ring clamp 24 to the axial flange 25 on the radial flange 15.

It will thus be seen that I have provided a sealing means which, while capable of "give and take" movement during the relative motion of the shell 1 with respect to the housing 4, provides a practically tight and effective seal between the atmosphere and the interior of the dryer, furnace or kiln or the like, thus preventing the escape of gases and material or the infiltration of air.

Other modes of applying the principle of my invention, in addition to the one herein and above described and illustrated in detail, may be employed, provided the structural elements stated by any of the following claims or the equivalent of such elements be utilized.

I, therefore, particularly point out and distinctly claim as my invention and discovery:

1. A seal for the joint between fixed and rotating parts of a rotary dryer and the like, comprising rotating and non-rotating annular bearing rings each carried by one of said parts and contacting each other in a radial plane with respect to the axis of said rotating part, axially extending and mutually overlapping flanges fixed to each of said rings, mounting studs attached to said non-rotating ring and having axial and radial movement connection with said fixed part, compression springs connected to said studs for urging said non-rotating ring toward said rotating ring, a flexible fabric tube attached at one end to said axially extending flange on said non-rotating ring and attached at the other end to another axially extending flange on said fixed part.

2. In a rotary dryer, the combination of a bearing ring mounted on the end of the rotating shell, a second bearing ring mounted on the stationary shell end-housing and contacting said first ring, axially extending and mutually overlapping flanges fixed to each of said rings, circumferentially spaced studs on said second ring for attaching the latter to said end-housing and projecting through a radial flange on said end-housing, compression springs mounted between said radial flange and connected to each of said studs for urging said second ring against said first ring and a flexible fabric tube attached at one end to the axially extending flange on said second ring and at the other end to another axially extending flange on said radial flange.

LYMAN W. JILLSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
967,294	Aldrich	Aug. 16, 1910
1,804,810	Reedy	May 12, 1931
1,872,665	Brownell	Aug. 23, 1932
2,381,432	Bratton	Aug. 7, 1945