

- [54] **SOOT BLOWER**
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FOREIGN PATENTS OR APPLICATIONS

525,397 1/1954 Belgium..... 15/317

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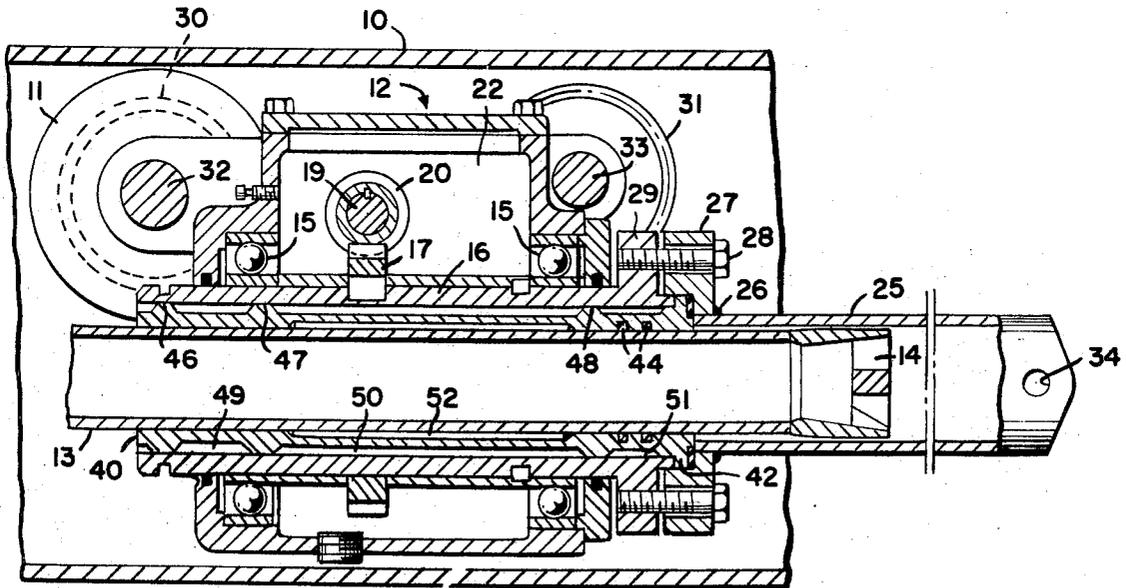
- [52] U.S. Cl..... 15/317, 122/390
- [51] Int. Cl..... A47I 5/38
- [58] Field of Search..... 15/316 R, 317;
 122/390, 392

[57] **ABSTRACT**

A soot blower of the type having a lance tube carried by a traveling carriage and a feed tube for supplying hot steam to the lance tube in which an insulating liner is provided between the feed tube and the carriage and a piston ring seal is provided between the liner and the feed tube at the front end of the carriage.

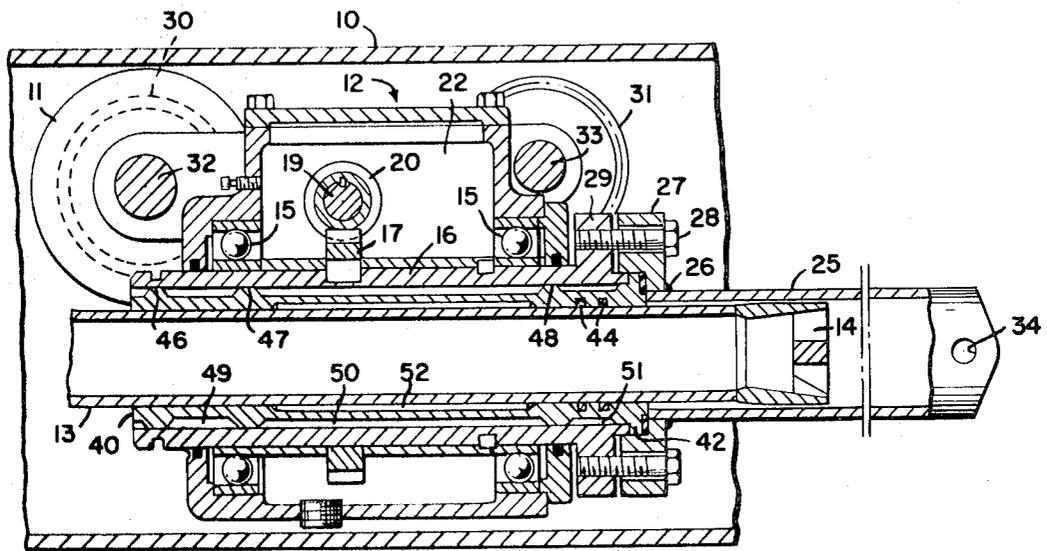
- [56] **References Cited**
- UNITED STATES PATENTS**
- 2,486,585 11/1949 Brelsford 15/317
- 2,883,694 4/1959 Hibner et al..... 15/317
- 3,195,165 7/1965 Matthews..... 15/317

6 Claims, 1 Drawing Figure



PATENTED AUG 7 1873

3,750,230



SOOT BLOWER

BACKGROUND OF THE INVENTION

This invention relates to soot blowers and particularly to soot blowers of the type having a retractable lance carried by a traveling carriage movable in a casing.

Soot blowers of the indicated type generally involve a long lance tube mounted on a traveling carriage movable in a casing in an arrangement in which the lance tube communicates with a soot blowing medium, usually steam at high temperature and pressure, by way of a feed tube which has its discharge end extending into the interior of the lance tube to maintain communication therewith as the lance tube is extended and retracted from the casing. A problem in soot blowers of the prior art is that the packing which forms a seal between the exterior of the feed tube and the interior of the lance tube and carriage assembly is deteriorated by the high pressure and high temperature steam which is used by the soot blower. Typically, this steam may be at 580° F. By reason of this packing deterioration, the prior art soot blowers carry the packing at the rear end of the carriage for ease of replacement. However, these arrangements provide a disadvantage in that they allow the hot steam to enter the annulus between the exterior of the feed tube and a carriage sleeve or spindle surrounding the feed tube, this steam passing back to the packing located at the rear of the carriage, thereby permitting excessive heating in this region of the carriage and deterioration of the lubricants provided in the carriage.

SUMMARY OF THE INVENTION

It is the general object of this invention to provide a soot blower of the indicated type which minimizes the temperatures that occur in the region of the traveling carriage and increases the life of the seal between the feed tube and the lance tube and carriage assembly. Briefly stated, the invention achieves the above objections by providing a seal between the carriage and the exterior of the feed tube located at the front of the carriage. This prevents the steam from entering the carriage region thereby limiting the heat applied to the carriage parts to that heat which is conducted from the hot feed tube. This heat conduction is minimized by the provision of an insulating liner. Also, by utilizing piston rings for this seal, the life of the seal is extended since the piston rings are better able to stand the deterioration effects produced by the high pressure and high temperature steam.

BRIEF DESCRIPTION OF THE DRAWING

The single FIGURE of the drawing is a fragmentary vertical longitudinal cross-sectional view through the carriage of a soot blower in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is shown as incorporated in a soot blower of the type shown in detail in U.S. Pat. No. 2,883,694 to which reference is made for details of construction. The soot blowing mechanism is mounted in an elongated casing 10 of a generally rectangular cross-sectional shape and includes a traveling carriage indicated generally at 12 which is provided with wheels

11 riding on tracks (not shown) as is described more fully in said patent. The supply conduit for the soot blowing medium, namely, high pressure steam, comprises a feed tube 13 which enters the casing 10 at the left-hand end thereof as viewed in the drawing and extends into the carriage from the rear end thereof generally centrally of the casing 10 terminating at a discharge end 14. The feed tube 13 remains stationary with respect to the casing 10 while the carriage 12 moves back and forth relatively to the casing 10 and the feed tube 13 during operation of the soot blower.

Some of the conventional parts of the carriage 12 include a sleeve or spindle 16 which is rotatably mounted in bearings 15 and to which a worm wheel 17 is connected. The worm wheel 17 is driven by a worm 20 which is mounted on a shaft 19 rotatably supported in bearings in the carriage 12. The worm 20 carries a drive sprocket at an end thereof as is shown in said prior-mentioned patent. The worm wheel 17 and the worm 20 are enclosed in a chamber 22 in the carriage 12 containing a suitable lubricant.

A long lance tube of the soot blower is shown at 25 and is welded at 26 to a flange 27 bolted to the sleeve 16 by bolts 28 which engage a sleeve flange 29. The lance tube 25 is larger in diameter than the feed tube 13 as is shown in the drawing so that the lance tube moves telescopically over the feed tube. The parts are arranged so that the discharge end 14 of the feed tube 13 is always in communication with the interior of the lance tube 25 so that in all relative positions the feed tube 13 supplies soot blowing medium to the lance tube 25.

As is described more fully in said patent, the carriage 12 is moved back and forth in the casing by a chain which has its ends connected to the carriage 12 and an intermediate portion passing around a driving sprocket (not shown) which is motor driven. The chain also passes around idler sprockets 30 and 31 mounted on shafts 32 and 33, respectively, carried by the carriage 12 to thereby guide the chain around the drive sprocket for the worm gear 20. By this arrangement, as the chain is driven to cause movement of the carriage 12 along the casing, it will cause rotation of the gears 20 and 17 to thereby cause a turning movement of sleeve 16 and the lance tube 25 secured thereto. The lance tube 25 is thus driven through such turning movement at the same time it is being advanced or retracted.

The lance is provided at its extremity with a pair of discharge nozzles 34 through which the soot blowing medium, such as steam under pressure, is emitted.

All of the above-described elements are described in detail in said prior mentioned patent and are conventional in the art.

In accordance with the invention, a seal is provided to prevent the flow of the soot blowing medium from the interior of the lance tube 25 past the front end of the carriage 12. To this end, an insulating liner 40 is mounted on the carriage 12 and is adapted to fit between the internal wall of the sleeve or spindle 16 and the external wall of the feed tube 13 as is shown in the drawing. Liner 40 has a flange 42 at its front end, this flange being secured between the bracket 27 and the front flange 29 of the sleeve 16 so that the liner 40 is held in place and rotates with the sleeve 16. A pair of sealing members 44 in the form of piston rings are contained within grooves in the internal wall of the liner 40 and cooperate with the feed tube 13 to provide a seal

between the internal wall of the liner 40 and the external wall of the feed tube 13. In accordance with the invention, the piston seals 44 are located at the front end of the carriage 12 to prevent the flow of the soot blowing medium (high pressure steam) from the area of the lance tube 25 adjacent the carriage 12 past the front end of the carriage 12 along the exterior of the feed tube 13. The piston ring seals 44 are made of a heat-resistant metal such as stainless steel, and various cobalt base alloys to insure long life and minimize deterioration by the high temperature steam.

Means are provided to minimize heat conduction from the feed tube 13 to the carriage 12. To this end, the insulating liner 40 is designed for a snug fit within the sleeve 16 with three small annular contact areas 46, 47 and 48 spaced along the liner 40 to provide dead air spaces 49, 50 and 51 between the liner 40 and the sleeve 16, these dead air spaces of course minimizing heat conduction. There is also provided a dead air space 52 between the liner 40 and the feed tube 13 which aids the minimization of heat conduction from the feed tube 13 to the carriage 12.

It will thus be apparent that the design in accordance with the invention, which involves the provision of a seal at the front end of the carriage 12 to prevent the flow of the steam from the lance tube 25 past the front end of the carriage 12, limits the heat generation in the carriage parts to conduction from the hot feed tube 13. Moreover, this conduction is minimized by the use of a spindle liner 40 between the feed tube 13 and the carriage sleeve 16, which liner is designed for minimum heat conduction. Accordingly, there will be no excessive heat produced in the carriage 12 and the lubricants in the carriage 12, such as in chamber 22, are protected from deterioration.

It will be apparent that various changes may be made in the construction and arrangement of parts without

departing from the scope of the invention. Accordingly, it is not desired to be limited except as required by the following claims.

I claim:

1. In a soot blower having a traveling carriage movable along a casing and supporting a lance tube at the front end thereof, a feed tube for supplying a high temperature soot blowing medium to the interior of the said lance tube, said carriage being mounted for movement along the exterior of said feed tube with the discharge end of said feed tube extending within the interior of said lance tube throughout said carriage movement, said carriage having an insulated carriage liner surrounding and in contact with said feed tube during said carriage movement, and means providing a seal to prevent flow of said soot blowing medium from the interior of said lance tube past the front end of said carriage along the exterior of said feed tube.
2. A soot blower according to claim 1 wherein said seal includes a sealing member between the interior of said carriage liner and the exterior of said feed tube located at the front end of said carriage.
3. A soot blower according to claim 2 wherein said contact between said liner and said feed tube is along a plurality of areas spaced along said liner to minimize heat conduction between said feed tube and said liner.
4. A soot blower according to claim 3 wherein said sealing means comprises a piston ring seal of heat resistant metal.
5. A soot blower according to claim 2 wherein said sealing means comprises a piston ring seal of heat resistant metal.
6. A soot blower according to claim 1 wherein said contact between said liner and said feed tube is along a plurality of areas spaced along said liner to minimize heat conduction between said feed tube and said liner.

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