COAL BURNER ASSEMBLY

CROSS-REFERENCES TO RELATED APPLICATIONS/PATENTS

[0001] This application relates back to and claims priority from U.S. Provisional Patent Application Ser. No. 60/832,445 filed on Jul. 21, 2006 and entitled "Coal Burner Plant."

FIELD OF THE INVENTION

[0002] The present invention relates generally to burner assemblies for heating and drying aggregate materials, and particularly to burner assemblies that are adapted to fire on coal for heating and drying aggregate materials used in connection with the production of hot mix asphalt.

BACKGROUND AND DESCRIPTION OF THE PRIOR ART

[0003] It is known to use burner assemblies to heat and dry aggregate materials used in connection with the production of hot mix asphalt. Conventional burner assemblies used in connection with the production of hot mix asphalt, however, suffer from one or more disadvantages. For example, conventional coal burners do not inject coal into the burner such that wear is minimized. Conventional coal burners do not uniformly mix air and coal dust because such burners swirl the air/coal mixture in order to stabilize the main flame. In addition, the swirl produced by conventional coal burners contributes to the excessive abrasive wear on the components of the burners.

[0004] It would be desirable, therefore, if an apparatus could be provided that would inject coal into a coal burner such that wear to the components of the burner is minimized. It would also be desirable if such an assembly could be provided that would uniformly mix air and coal dust. It would be further desirable if such an assembly could be provided that would produce a stable main flame without swirling the air or coal in the coal burner.

ADVANTAGES OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0005] It is an advantage of the preferred embodiments of the invention described and claimed herein to provide a coal burner assembly adapted for use in connection with the production of hot mix asphalt. It is also an advantage of the preferred embodiments of the invention to inject coal into a coal burner assembly such that wear to the components of the burner assembly is minimized. It is a further advantage of the preferred embodiments of the invention to provide a coal burner assembly that uniformly mixes air and coal dust. It is a still further advantage of the preferred embodiments of the invention to provide a coal burner assembly that produces a stable main flame without swirling the air or coal in the coal burner assembly.

[0006] Additional advantages of the preferred embodiments of the invention will become apparent from an examination of the drawings and the ensuing description.

SUMMARY OF THE INVENTION

[0007] The invention comprises a burner assembly including a housing having an air inlet, a burner end having an opening, a longitudinal axis extending generally from the air inlet toward the burner end, a motor, and an impeller mounted in the housing and being in fluid communication with the air inlet, operatively connected to the motor and adapted to direct air from the air inlet towards the burner end. The burner assembly also includes a coal tube adapted to convey coal toward the burner end, a coal inlet adapted to convey coal to the coal tube, a first bluff body ring mounted at the burner end, a second bluff body ring mounted at the burner end, a third bluff body ring mounted at the burner end, and at least one flame bridge disposed between the first bluff body ring and the second bluff body ring. The burner assembly further includes an igniter mounted in the burner end and being adapted to ignite the air and fuel mixture in the burner end to produce a main flame.

[0008] In the preferred embodiments of the burner assembly, the coal tube is disposed substantially parallel to the longitudinal axis of the burner assembly, the coal inlet is disposed substantially perpendicular to the coal tube, and the at least one flame bridge extends radially from the first bluff body ring toward the second bluff body ring. Also in the preferred embodiments, the burner assembly includes a flame retention cone having a diverging angle of at least approximately 45° relative to the longitudinal axis of the burner assembly and a cylindrical portion mounted in the burner end and having a jog. The preferred embodiments of the burner assembly further include an atomizing nozzle, at least one gas injection nozzle, at least one screen and a coal tube band.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The presently preferred embodiments of the invention are illustrated in the accompanying drawings, in which like reference numerals represent like parts throughout, and in which:

[0010] FIG. **1** is a perspective view of the preferred embodiment of the coal burner assembly in accordance with the present invention.

[0011] FIG. **2** is a front view of the preferred embodiment of the coal burner assembly illustrated by FIG. **1**.

[0012] FIG. **3** is a right side view of the preferred embodiment of the coal burner assembly illustrated by FIGS. **1-2**.

[0013] FIG. **4** is a partial sectional perspective view of the preferred embodiment of the coal burner assembly illustrated by FIGS. **1-3**.

[0014] FIG. **5** is a partial sectional perspective view of the preferred burner end of the coal burner assembly illustrated by FIGS. **1-4**.

[0015] FIG. **6** is a partial sectional front view of the preferred embodiment of the coal burner assembly illustrated by FIGS. **1-5**.

[0016] FIG. **7**A is a partial sectional perspective view of the preferred burner end of the coal burner assembly illustrated by FIGS. **1-6**.

[0017] FIG. **7**B is an enlarged partial sectional perspective view of the preferred liquid fuel assembly of the coal burner assembly illustrated by FIG. **7**A.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0018] Referring now to the drawings, the preferred embodiment of the coal burner assembly in accordance with the present invention is illustrated by FIGS. **1** through **7**B. As shown in FIGS. **1-7**B, the preferred coal burner assembly is designated generally by reference numeral **20**. The preferred coal burner assembly **20** is an auxiliary fuel supported burner.