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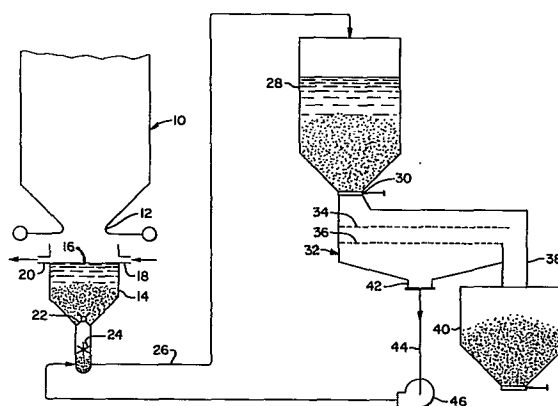
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(54) **An ash disposal system for ash discharged from a coal-fired combustion chamber.**

(57) Apparatus for handling ash produced in the combustion of coal in the furnace (10) of a steam generator, including an ash hopper (14) beneath the furnace (10), a water transport system (26) for carrying the ash away from the hopper (14), a screen arrangement (32) for separating most of the water from the ash, and a relatively small settling bin (40) or tank for separating the ash from the remainder of the water. The separated water can be recycled in a closed loop (44), to be used again as the transport water.



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AN ASH DISPOSAL SYSTEM FOR ASH DISCHARGED FROM
A COAL-FIRED COMBUSTION CHAMBER

The invention relates to an ash disposal system for ash discharged from a coal-fired combustion chamber, particularly for the pretreatment to dewater bottom ash from a steam generator firing solid fuels.

In coal-fired steam generators, the manner in which the ash is disposed of is a matter of considerable importance. The equipment for handling the ash is costly and can require much maintenance. In prior systems, the ash is usually removed from an ash hopper beneath the steam generator furnace along with a considerable amount of water and allowed to settle out in dewatering bins over a long period of time, such as 18 hours. Thus, large amounts of water have to be stored and held in reserve, not only requiring much water but also a huge storage facility. Also, in colder climates, the dewatering bins are subject to freezing and plugging during the lengthy dewatering period.

The invention as claimed is intended to provide a remedy. In particular, the invention provides an ash handling system for the furnaces of steam generators, including an ash hopper beneath the furnace, a water transport system for carrying the ash away from the hopper, a screen arrangement for separating most of the water from the ash so it can be recycled, and a relatively small settling bin for separating the ash from the remainder of the water.

One way of carrying out the invention is described in detail below with reference to the drawing, wherein the figure is a sectional side view of an ash disposal system for the furnace of a steam generator.

In the Figure, numeral 10 designates the furnace of a steam generator in which coal is burned as a fuel. Slag and ash fall through the bottom opening 12 into an ash hopper 14, which is kept filled with water to a level 16 by means of pipe 18,

which continuously admits water to the hopper. An overflow pipe 20 keeps the water level constant.

5 A valve 22 is periodically opened to discharge the ash. A
clinker grinder 24 breaks up the large ash particles so that they
will not become jammed in the discharge opening, and so that they
may be easily transported in a stream of water away from the hopper
14. Generally, the material discharged from the hopper 14 contains
75% solids, and 25% water. Water is added to the transport pipe 26,
so that the mix transported therein is 20% ash and 80% water. This
10 mixture is transported to a holding or surge tank 28.

A gate valve 30 in the bottom of tank 28 can be opened at
short intervals, or be maintained in an opened position except when
the equipment downstream thereof is being repaired, to discharge the
ash and water into a vibrating dewatering screen arrangement 32. A
15 pair of screens, 34 and 36, are continuously vibrated in any well-
known manner, to separate the ash from a majority of the water. The
first screen 34 can separate out the more coarse particles, and
screen 36 can remove the fines.

The screens are preferably slightly inclined, so that the
20 solids gravitate towards and are discharged through outlet 38. Some
water will still be carried over with the ash. The mixture being
discharged through outlet 38 will be approximately 25% water and 75%
ash, and is discharged into holding tank 40. From here, it can be
discharged into a truck, storage pond, etc.

25 The water flowing through the screens is discharged through
opening 42, and flows through pipe 44 and pump 46 back to the hopper
discharge to be used again as transport water.

From the above, it can be seen that a system is provided
which eliminates the need for large settling tanks. The majority
30 of the water can be quickly recycled, thus reducing the requirement
for large quantities of water. Also, because very little time is
involved, there are no freezing or plugging problems in the system.
The majority of the water is constantly flowing.

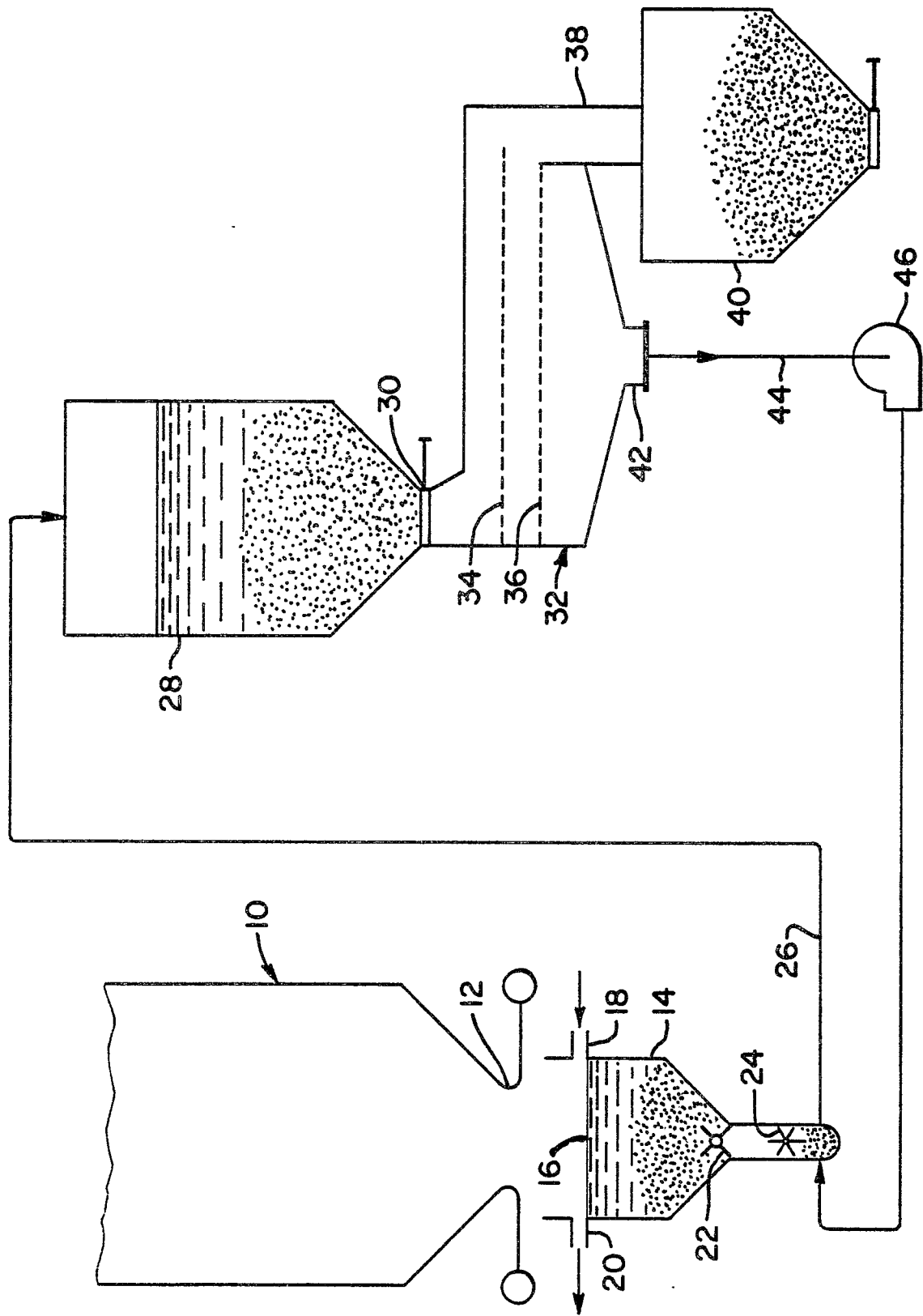
Claims:

1. An ash disposal system for ash discharged from a coal-fired combustion chamber, including an ash hopper (14) positioned beneath the combustion chamber (10) into which the ash falls, means (18,20) for maintaining a given water level (16) in the ash hopper (14), a discharge opening in the bottom of the ash hopper (14), through which the ash is discharged, screen means (34,36) for separating ash from water, pipe means (26) connecting the ash hopper (14) discharge opening with the screen means (32), means for adding transport water to the pipe (26) at a point adjacent the ash hopper (14) discharge opening, means (42-46) for recycling the water separated in the screen means (32) back to the point adjacent the ash hopper (14) discharge opening, and means (38) by which the separated ash can be discharged from the screen means (32).

2. An ash disposal system as set forth in Claim 1, including a holding tank (28) in the pipe means (26) upstream of the screen means (32).

3. An ash disposal system set forth in Claim 2, wherein the screen means (32) includes a pair of screens (34,36), the first of which separates coarse ash particles from the water, and the second of which separates fine ash particles from the water.

4. An ash disposal system as set forth in Claim 3, including a settling tank (40) downstream of the screen means (32) ash discharge opening (38).





DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	GB - A - 134 081 (WOOD) + Page 2, lines 37-41; fig. 1 + --	1,4	F 23 J 1/02
X	GB - A - 220 749 (THE UNDERFEED STOKER CO.) + Totality + --	1-4	
	DE - C - 967 861 (BABCOCK & WILCOX) + Page 2, lines 14-37 + --	1	TECHNICAL FIELDS SEARCHED (Int.Cl. ³)
A	AT - B - 137 077 (ROTHSTEIN) + Page 1, lines 11-25 + ----	1	F 23 J 1/00
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
X	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search VIENNA		Date of completion of the search 11-02-1981	Examiner TSCHÖLLITSCH