

Description

Title of the Invention

ASH DISCHARGER

5 Field of the Invention

[0001]

The present invention relates to an ash discharger to cool and discharge incinerated ash.

10 Background of the Invention

[0002]

Conventionally, incinerator plants have been known as plants for incinerating objects to be incinerated such as waste. In an incinerator (e.g., a stoker incinerator) in this plant, ash (i.e., incinerated ash), generated by
15 combusting the objects, is dropped from an ash chute to an ash discharger through an introduction port, is cooled by stored water in a cooling tank of the ash discharger, and then is discharged from a discharge port of the ash discharger to a conveying device. The ash discharger has a scraper (which is also referred to as a "pusher") that pushes the incinerated ash cooled by the
20 stored water to the discharge port. The scraper is reciprocated by a drive device in a forward direction that is toward the discharge port and in a backward direction opposite to the forward direction to push out the incinerated ash in the stored water to the discharge port. When the incinerated ash is pushed out and discharged, the incinerated ash containing moisture is
25 discharged.

[0003]

Characteristics of the incinerated ash are different depending on types of waste to be incinerated. For example, some kinds of the incinerated ash are easy to be pushed out by the scraper and to be discharged because of its
30 hardness, and others are difficult to be pushed out by the scraper and to be discharged because of its softness.

Therefore, an ash pressing device was developed that reduces a water content by pressing (i.e., compacting) the incinerated ash to such hardness that the incinerated ash can be easily pushed out by a scraper (See Patent Document
35 1). This ash pressing device has a resistance plate swingably supported by using a horizontal pin in a direction orthogonal to a push-out direction of the incinerated ash, and the resistance plate presses the incinerated ash. For

biasing the resistance plate, the own weight of the resistance plate itself may be used, and a spring or a cylinder device may be additionally used.

Citation List

Patent Literature

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[0004]

Patent Document 1: JP 2000-55341 A

Summary of the Invention

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Issue to be solved by the Invention

[0005]

However, with the structure in which the resistance plate is swingably supported to press the incinerated ash as in the ash pressing device of Patent Document 1, its installation cost may be high, and its maintenance cost may also increase. That is, an ash discharger adopting the ash pressing device having such a complicated structure inevitably increases costs.

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The present invention has been made in view of the above-described issues, and an object of the present invention is to provide an ash discharger that has a simple structure, and can reduce a water content of the incinerated ash, can improve discharging performance of the incinerated ash, and can reduce its manufacturing cost and its maintenance cost, that is, can enhance the cost effectiveness.

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Solution to the Issue

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[0006]

An ash discharger according to the present invention includes a cooling tank including an introduction port into which incinerated ash is introduced, a discharge port having a rectangular shape from which the incinerated ash cooled by stored water is discharged, and a first bottom plate forming an upward inclination from below the introduction port toward the discharge port, a drive device arranged in a drive room disposed on a side opposite to the discharge port relative to the introduction port, and making a scraper perform a reciprocating motion toward and from the discharge port,

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a chute arranged outside the cooling tank, and including at least two side walls that are connected to the discharge port and that are opposed to each other, and

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a second bottom plate supported between the two side walls.

The second bottom plate is arranged outside the cooling tank, on an extension line along the upward inclination, and continuously from the first bottom plate. And a length of a drain region, which is formed by using the first bottom plate and the second bottom plate, is able to be adjusted.

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Advantageous Effects of the Invention

[0007]

According to the ash discharger of the present invention, the second bottom plate is supported between at least the two side walls included in the chute arranged outside the cooling tank, is continuously disposed on the extension line along the upward inclination of the first bottom plate, which is upwardly inclined toward the discharge port in the cooling tank, and is able to adjust the length of the drain region, which is formed by using the first bottom plate and the second bottom plate. Because the second bottom plate is continuously disposed outside the cooling tank along the inclination of the first bottom plate, the ash discharger looks like to have the first bottom plate which is extended outside the cooling tank, and therefore, the length of the drain region, which is formed by using the first bottom plate and the second bottom plate, is able to be adjusted.

By increasing the amount of the extension, that is, the number of the second bottom plates, a drain region is more increased, which is for reducing the water content in the incinerated ash by pressurization due to the own weight of the incinerated ash. As a result, the hardness of the incinerated ash in the vicinity of the scraper is increased, and the scraper easily pushes out the incinerated ash. For example, there are some situations that a conventional ash discharger, which has a drain region having a constant length, cannot discharge incinerated ash easily. However, because the length of the drain region is adjustable in the ash discharger according to the present invention, the ash discharger can easily adjust and change the length of the drain region to an appropriate length, and therefore, the ash discharger can reduce the water content of the incinerated ash and can show excellent discharging performance of the incinerated ash.

Further, because the second bottom plate, which is supported between both side walls of the chute, is arranged to form a simple structure in which the second bottom plate is continuously set from the first bottom plate, the simple structure can be inexpensive, and furthermore, an increase in installation cost and maintenance cost regarding the ash discharger can be suppressed.

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As a result, it is possible to provide an ash discharger that has a simple structure, that can reduce the water content of the incinerated ash, that can improve discharging performance of the incinerated ash, and that can reduce its manufacturing cost and its maintenance cost, and therefore, it is possible to provide an ash discharger that can enhance its cost effectiveness.

Brief Description of Drawings

[0008]

FIG. 1 is a cross-sectional view of an ash discharger according to an embodiment.

FIG. 2 is a cross-sectional view, which is taken along an A-A line with arrows, of the ash discharger in FIG. 1.

FIG. 3 is a cross-sectional view, which is taken along a line B-B with arrows, of the ash discharger in FIG. 2.

FIG. 4 is a perspective view of a first rail used in the ash discharger.

FIG. 5 is a cross-sectional view of a second rail in an ash discharger according to Modification 1.

FIG. 6 is a perspective view of a metal bracket in the ash discharger according to Modification 2.

Description of Embodiments of the Invention

[0009]

An ash discharger according to an embodiment of the present invention will be described below in detail with reference to drawings. In FIG. 1, for convenience of description, an orthogonal coordinate system including an X-axis, a Y-axis, and a Z-axis is appropriately used.

The embodiment is merely an example, and there is no intention to exclude various modifications and applications of technologies that are not explicitly described. Except for elements essential to the present invention, each of elements described in the embodiment can be selected or variously modified as necessary.

[0010]

An ash discharger 1 according to the embodiment will be described with reference to FIGS. 1 to 4.

At least, the ash discharger 1 includes a cooling tank 4 including an introduction port 2 into which incinerated ash is introduced, a discharge port 3 having a rectangular shape from which the cooled incinerated ash is discharged, and a bottom plate 8A (i.e., a first bottom plate) forming an upward inclination

from below the inclination ash 2 toward the discharge port 3, the ash discharger 1 includes a drive device 6 arranged in a drive room 4a disposed on a side opposite to the discharge port 3 relative to the introduction port 2 and making a scraper 5 perform a reciprocating motion toward and from the discharge port 3, and the ash discharger 1 includes a chute 7 which is disposed outside the cooling tank 4 and which includes at least two side walls 7a connected to the discharge port 3 and opposed to each other, and one or more of second bottom plates 16 supported between the two side walls.

Each of the second bottom plates 16 is disposed outside the cooling tank 4, on an extension line along the upward inclination of the first bottom plate 8A disposed at the upward inclination in the cooling tank 4, and the second bottom plate 16 is disposed continuously from the first bottom plate 8A.

Conventionally, a drain region is formed only in a cooling tank. However, in the ash discharger 1 as the embodiment, the drain region 8d can be enlarged to the outside of the cooling tank 4, for one or more of the second bottom plates 16 to be arranged in this manner.

Hereinafter, the cooling tank 4, the drive device 6, the scraper 5, and the chute 7 in the ash discharger 1 will be described in this order, and then the second bottom plate 16 will be described in detail.

[0011]

First, the cooling tank 4 will be described.

The introduction port 2 in the cooling tank 4 is formed by a wall surface 9 having a tubular shape (e.g., a rectangular and tubular shape). The wall surface 9 having the tubular shape is directly coupled to an ash chute (not illustrated). An upper end of the ash chute is connected to an incinerator (not illustrated) (e.g., an after-burning stage of a stoker incinerator). The incinerated ash generated in the incinerator is introduced into the cooling tank 4 from the introduction port 2.

In the cooling tank 4, water for cooling the incinerated ash is stored at a reference water level (i.e., indicated by a dashed line in FIG. 1). In order to form a so-called "water sealing" configuration, a lower end of the wall surface 9 is positioned below the reference water level of the stored water in the cooling tank 4.

[0012]

A bottom plate 8 of the cooling tank 4 includes a first inclined surface 8a, which is inclined upward from immediately below the introduction port 2 toward a lower edge 3a of the discharge port 3 having a rectangular shape (i.e., to be specific, a vertically lower end of the discharge port 3), and a second

inclined surface 8b, which is inclined upward from immediately below the introduction port 2 toward a side opposite to the first inclined surface 8a. A part of the bottom plate 8, corresponding to the first inclined surface 8a, is referred to as the "first bottom plate 8A".

5 In the cooling tank 4, a part in the bottom plate immediately below the introduction port 2 (hereinafter referred to as a "lowermost surface 8c") is the lowest, and the bottom plate 8 has a curved shape that protrudes downward. A cross-sectional shape of the cooling tank 4 is uniform in a width direction (i.e., Z-axis direction), and width dimensions (i.e., dimensions in the Z-axis
10 direction orthogonal to the page of FIG. 1) of the first inclined surface 8a, the lowermost surface 8c, and the second inclined surface 8b are all the same.

In the cooling tank 4, the drive room 4a with the drive device 6 herein is arranged on a side opposite to the discharge port 3 relative to the introduction port 2.

15 [0013]

Next, the drive device 6 and the scraper 5 will be described.

The drive device 6 is a device to drive the scraper 5 and is arranged above the second inclined surface 8b at a position which is not immersed in the stored water (i.e., above the "reference water level"). The drive device 6
20 includes a drive shaft 6a rotatable in two directions and an arm 6b coupling the scraper 5 and the drive shaft 6a. The drive device 6 drives the arm 6b by rotating the drive shaft 6a, and as a result, gets the scraper 5 connected to the arm 6b to perform a reciprocating motion in forward and in backward.
[0014]

25 The scraper 5 is a device which pushes out the incinerated ash cooled by the stored water toward the discharge port 3. The scraper 5 includes an upper plate 5a facing upward, a push-out plate 5b facing the discharge port 3, and both side plates connected to the upper plate 5a and the push-out plate 5b (however, only one side plate 5c of the side plates is illustrated in FIG. 1).
30 Because the lower plate corresponding to the upper plate 5a is not arranged, the scraper 5 has a box-like shape opened toward the bottom plate 8 of the cooling tank 4.

When the arm 6b is driven, the scraper 5 moves forward and moves backward along the bottom plate 8, while a lower end of the push-out plate 5b
35 (i.e., a tip end 5d of the scraper 5) is being in contact with the entire width of the bottom plate 8 of the cooling tank 4.

Here, the "moving forward" regarding the scraper 5 means that the scraper 5 moves in a direction (i.e., +X-axis direction in FIG. 1) in which the

incinerated ash is pushed out toward the discharge port 3. Further, the "moving backward" regarding the scraper 5 means that the scraper 5 moves in a direction (i.e., -X-axis direction in FIG. 1) opposite to the direction indicated by "moving forward". Furthermore, the "entire width" of the bottom plate 8 of the cooling tank 4 means a dimension in the width direction (i.e., Z-axis direction) of the inside of the cooling tank 4.

[0015]

In the drive room 4a, there are a water level gauge 10 which detects a water level of the stored water in the cooling tank 4 and a supply pipe 11 which supplies water into the cooling tank 4 based on the water level detected by the water level gauge 10. Specifically, the water level gauge 10 and the supply pipe 11 are arranged to penetrate a ceiling plate 12 for the drive room, disposed above the second inclined surface 8b and above the drive device 6 in the drive room 4a, and fixed to the ceiling plate 12.

The water level gauge 10 measures the water level of the stored water in the cooling tank 4 and transmits the measurement data to the control device 14.

The supply pipe 11 is connected to a water source (not illustrated), such as a water storage tank, and is provided with a nozzle 11a at a tip end thereof to supply (e.g., to provide) water to the cooling tank 4. The supply pipe 11 is provided with a solenoid valve 11b between the water source (not illustrated) and the nozzle 11a, and whether or not water is supplied from the supply pipe 11 is controlled by opening and closing of the solenoid valve 11b.

[0016]

The control device 14 controls the opening and the closing of the solenoid valve 11b based on the measurement data of the water level gauge 10. For example, when the measurement data corresponds to a water level lower than the reference water level, the control device 14 opens the solenoid valve 11b to supply water from the supply pipe 11 to the cooling tank 4. When the measurement data corresponds to a water level equal to or higher than the reference water level, the solenoid valve 11b is closed to stop supplying water from the supply pipe 11 to the cooling tank 4.

In addition, the drive room 4a is provided with a drain pipe 13, which automatically drains the stored water when the water level of the stored water exceeds the reference water level. A position (i.e., an overflow level) of an opening at an upper end of the drain pipe 13 is disposed above the reference water level (e.g., above the reference water level by about 10 cm). Thus, the excessive stored water automatically overflows and is discharged from the drain pipe 13.

[0017]

Next, the chute 7 will be described.

The chute 7 is arranged outside the cooling tank 4, and the chute 7 includes at least two side walls 7a that are opposed to each other and that are individually connected to corresponding two side edges 3b in the width direction (i.e., Z-axis direction) of the discharge port 3 having a rectangular shape. An interval between the two side walls 7a in the width direction (i.e., Z-axis direction) is preferably equal to an interval of the discharge port 3 having a rectangular shape in the width direction.

The chute 7 guides the incinerated ash from the discharge port 3 to a conveying device 15 when the second bottom plates 16 are not arranged, and the chute 7 guides the incinerated ash from the second bottom plate 16 arranged at the edge in the +X-axis direction among the second bottom plates 16 to the conveying device 15 when the second bottom plates 16 are arranged to enlarge the drain region 8d, for the incinerated ash to be fallen to the conveying device 15 due to its own weight. The conveying device 15 is a device which conveys the discharged incinerated ash to the outside of the ash discharger 1, and the conveying device 15 is, for example, a conveyor.

In the ash discharger 1 as the embodiment, as illustrated in FIGS. 1 to 4, one first rail 17 having a long length is fixed to each of the two side walls 7a on the extension line along the upward inclination of the first bottom plate 8A inclined upwardly in the cooling tank 4. The fixing may be performed by welding to the side wall 7a or by fastening to the side wall 7a with a bolt and a nut, or the like. Because the first rail 17 is fixed on the extension line along the upward inclination, the first rail 17 is inclined in order that some part of the first rail 17 is positioned toward the +Y-axis direction more when the some part is positioned toward the +X-axis direction more.

[0018]

Here, the expression "on the extension line along the upward inclination" means not only a positional relationship being correctly on the extension line of the upward inclination of the first bottom plate 8A inclined upwardly in the cooling tank 4, but also a positional relationship including a slight difference in view of an angle of the upward inclination or a slight positional deviation, as long as the positional relationship is on the extension line "along" the upward inclination. For example, the more some part of the first rail 17 is positioned toward the +X-axis direction, the more the some part is positioned toward the +Y-axis direction, but the angle of the inclination of the first rail 17 may be different from the angle of the inclination of the first

bottom plate 8A at the discharge port 3, according to its design. In addition, upper surfaces of the first bottom plate 8A and the second bottom plate 16 do not need to be flush and may have a positional deviation therebetween.

Further, because the extension line does not need to be a straight line and may be a curved line, the first rail 17 does not need to be a linear shape and may be a curved shape if it can support the second bottom plate 16.

Even with these configurations, because the drain region 8d can be extended to the outside of the cooling tank 4, the water content of the incinerated ash can be reduced by pressurization caused by the own weight of the incinerated ash, and the hardness of the incinerated ash in the vicinity of the scraper can be enhanced by the pressurization caused by the own weight of the incinerated ash. Therefore, the discharge of the incinerated ash by using the scraper can be facilitated.

The support for the second bottom plate 16 by the first rail 17 will be described in detail later.

[0019]

As described above, the chute 7 may include at least both side walls 7a, but as illustrated in FIG. 1, the chute 7 may include a top wall 7b connected to the upper edge of the discharge port 3 having a rectangular shape and the both side walls 7a and disposed on a XZ plane, a front wall 7c connected to an edge of the top wall 7b in the +X-axis direction and the both side walls 7a, and a rear wall 7d connected to the lower edge 3a of the discharge port 3 having a rectangular shape and the both side walls 7a and disposed on a YZ plane.

The top wall 7b, the two side walls 7a, the front wall 7c, and the rear wall 7d form a flow path for the incinerated ash. The flow path has a closed tubular shape with the discharge port 3 serving as an inlet and an opening 7e serving as an outlet. Because the flow path has the closed tubular shape, scattering of the incinerated ash to the outside of the ash discharger 1 can be prevented.

[0020]

Next, the second bottom plate 16 and the support for the second bottom plate 16 by the first rail 17 will be described in detail.

As illustrated in FIG. 3, the second bottom plate 16 has a rectangular shape and is preferably made of a metal having a wear resistance similar to that of the bottom plate 8. A length of a long side of the second bottom plate 16 is equal to or slightly smaller than the interval between the two side walls 7a of the chute 7 in the width direction (i.e., Z-axis direction). It is desirable that a length of a short side of the second bottom plate 16 is shorter than the long

side, for example, equal to or less than $1/3$ of the long side, in view of convenience of work for setting the second bottom plate 16. The length of the short side of the second bottom plate 16 may be set to about $1/20$ to $1/10$ of the long side in view of convenience of work and more delicate adjustment for
 5 extending the drain region 8d.

Here, the lengths of the short side of the second bottom plates 16 having a rectangular shape, when a plurality of the second bottom plates 16 are prepared and used, are all the same. However, for example, the second bottom plates 16 with short sides whose lengths have a plurality of variations
 10 such as L , $2L$ (i.e., double of L), and $3L$ (i.e., three times of L) may be prepared in advance, and the second bottom plates 16 having the short sides with lengths different from each other may be appropriately mixed and disposed on the first rail 17. As a result, when the drain region 8d is extended to the outside of the cooling tank 4, more delicate adjustment can be performed.

15 [0021]

As illustrated in FIG. 4, the first rail 17 is a metal angle member having a long length and having an L-shaped cross section. The first rail 17 includes a vertical surface 17a along the side wall 7a and a placing surface 17b substantially perpendicular to the vertical surface 17a. The vertical surface
 20 17a is a fixing surface that fixes the first rail 17 to the side wall 7a. The vertical surface 17a of the first rail 17 and the side wall 7a may be fastened by using a bolt and a nut or may be fixed by welding.

The placing surface 17b is a surface on which the second bottom plates 16 are placed, and the placing surface 17b supports the second bottom plates
 25 16. In order to fasten the plurality of second bottom plates 16 to the placing surface 17b with the bolts 18a and the nuts 18b, a plurality of through-holes 17c, through which the bolts 18a are inserted, are provided at the placing surface 17b. However, in FIG. 4, only one through-hole 17c is illustrated, and the other through-holes are omitted.

30 [0022]

In FIG. 3, in the second bottom plate 16, through-holes are formed at four positions in total, two of that are formed in a portion of the second bottom plate 16 placed on the first rail 17 which is fixed on the side wall 7a in the +Z-axis direction and the other two of that are formed in a portion of the second
 35 bottom plate 16 placed on the first rail 17 which is fixed on the side wall 7a in the -Z-axis direction. That is, in the second bottom plate 16, similar two through-holes, corresponding to the through-holes 17c of the first rail 17, are formed on each side of the second bottom plate 16 in the Z-axis direction

respectively. After the through-holes of the second bottom plate 16 and the through-holes 17c of the first rail 17 are aligned with each other, the bolts 18a are inserted to the through-holes and fastened with the nuts 18b, and then, the second bottom plates 16 are supported and fixed between the two side walls 7a as illustrated in FIG. 2.

When a plurality of second bottom plates 16 are fixed to the respective first rails 17 of the two side walls 7a of the chute 7, as illustrated in FIG. 3, the first bottom plate 8A and one of the second bottom plate 16 are fixed in contact with each other at the lower edge 3a of the discharge port 3 of the cooling tank 4, and then the plurality of second bottom plates 16 are sequentially and continuously fixed without gaps toward the +X-axis direction.

The metal angle member having the L-shape is not only inexpensive but also has a simple configuration in which the second bottom plates 16 are placed on and fixed to two of the first rails 17, and therefore, it is possible to reduce the manufacturing cost and to reduce the maintenance cost due to easy maintenance.

[0023]

The reason for fixing the second bottom plate 16 on the placing surface 17b of the first rails 17 by using the bolts 18a and the nuts 18b is that the second bottom plate 16 is detachable. Therefore, when the drain region 8d is extended to the outside of the cooling tank 4, the length of the drain region 8d can be easily adjusted.

Because types of waste to be incinerated changes in each season, characteristics of incinerated ash may be different in each season. Therefore, there are some situations that a conventional ash discharger cannot discharge incinerated ash easily, because the conventional ash discharger has a drain region having a constant length. However, the ash discharger 1 as the embodiment can easily adjust and change the length of the drain region 8d to an appropriate length in every season, and therefore, the ash discharger 1 can reduce the water content of the incinerated ash and can show excellent discharging performance of the incinerated ash, regardless of the seasons.

[0024]

In FIGS. 1 to 4, only one first rail 17 is fixed to one of the side walls 7a. However, instead of the first rail 17, a plurality of second rails 17', each of which has the same cross-sectional shape as that of the first rail 17 and has a length shorter than that of the first rail 17, may be intermittently arranged at intervals from each other on the extension line on which one of the first rails 17 is to be arranged, as shown in an ash discharger 1' as Modification 1 in FIG. 5.

When the second rails 17' are intermittently disposed in this manner, similar to the first rail 17, it is required that the second bottom plates 16 can be continuously supported by the second rails 17' and fixed without gaps to the second rails 17'. The ash discharger 1' as Modification 1 is different from the ash discharger 1 as the embodiment, regarding only the configuration described here, and the other configurations of the ash discharger 1' are similar to those of the ash discharger 1. Therefore, the same configurations are denoted by the same reference numerals and signs as those of the ash discharger 1 and descriptions thereof will be omitted.

In addition, as in an ash discharger as Modification 2 illustrated in FIG. 6, a plurality of metal brackets 17'', each of which has the same cross-sectional shape as that of the second rail 17' and has a length shorter than that of the second rail 17', may be intermittently arranged at intervals from each other. When the metal brackets 17'' are intermittently disposed in this manner, similar to the first rail 17, it is required that the second bottom plates 16 can be continuously supported by the metal brackets 17'' and fixed without gaps to the metal brackets 17''. The ash discharger as Modification 2 differs from the ash discharger 1' as Modification 1 only in the configuration described here, and the other configurations are similar to those of the ash discharger 1'. Therefore, as in Modification 1, the same configurations as those of the ash discharger 1 are denoted by the same reference numerals and signs as those of the ash discharger 1, and descriptions thereof will be omitted.

[0025]

The ash dischargers as the embodiment, Modification 1 and Modification 2 has been described above. However, these are merely examples, and as long as the second bottom plates 16 can be supported between the two side walls 7a, for example, the second rails 17' and the metal brackets 17'' may be mixed and disposed to the side walls 7a.

Further, for example, like a shutter of a garage, a plurality of second bottom plates 16 having a rectangular shape may be stored below the bottom plate 8 of the cooling tank 4 in a state that the plurality of second bottom plates 16 are bendably coupled to each other, and may be slidably drawn out from the lower edge 3a of the discharge port 3 depending on the characteristics of the incinerated ash, and may be placed on the first rails 17, the second rails 17' or the metal brackets 17'' to be supported between the both side walls 7a of the chute 7.

Further, for example, the second bottom plates 16 may be configured as a bottom plate of a rectangular tube, instead of the rectangular structure as

described above, and the rectangular tube may be configured to be slidable to be put in and out through the discharge port 3 of the cooling tank 4 according to the characteristics of the incinerated ash. In this case, the bottom plate of the rectangular tube is placed on the first rails 17, the second rails 17' or the metal brackets 17" and supported between the both side walls 7a of the chute 7.

Reference Signs List

	[0026]
	1, 1' Ash discharger
10	2 Introduction port
	3 Discharge port
	3a Lower edge
	3b Side edge
	4 Cooling tank
15	4a Drive room
	5 Scraper
	5a Upper plate
	5b Push-out plate
	5c Side plate
20	5d Tip end
	6 Drive device
	6a Drive shaft
	6b Arm
	7 Chute
25	7a Side wall
	7b Top wall
	7c Front wall
	7d Rear wall
	7e Opening
30	8 Bottom plate
	8a First inclined surface
	8b Second inclined surface
	8c Lowermost surface
	8d Drain region
35	8A First bottom plate (bottom plate 8 having the first inclined surface 8a)
	9 Wall surface
	10 Water level gauge
	11 Supply pipe

- 11a Nozzle
- 11b Solenoid valve
- 12 Ceiling plate for the drive room
- 13 Drain pipe
- 5 14 Control device
- 15 Conveying device
- 16 Second bottom plate
- 17 First rail
- 17a Vertical surface
- 10 17b Placing surface
- 17c Through-hole
- 17' Second rail
- 17" Metal bracket
- 18a Bolt
- 15 18b Nut

Claims

[Claim 1]

5 An ash discharger, comprising
a cooling tank including
an introduction port into which incinerated ash is introduced,
a discharge port having a rectangular shape from which the
incinerated ash cooled by stored water is discharged, and
a first bottom plate forming an upward inclination from below the
10 introduction port toward the discharge port,
a drive device arranged in a drive room disposed on a side opposite to
the discharge port relative to the introduction port, and making a scraper
perform a reciprocating motion toward and from the discharge port,
a chute arranged outside the cooling tank, and including at least two side
15 walls that are connected to the discharge port and that are opposed to each
other, and
a second bottom plate supported between the two side walls,
wherein the second bottom plate is arranged outside the cooling tank, on
an extension line along the upward inclination, and continuously from the first
20 bottom plate, and
wherein a length of a drain region, which is formed by using the first
bottom plate and the second bottom plate, is able to be adjusted.

[Claim 2]

25 The ash discharger according to claim 1,
wherein a first rail is fixed to each of the two side walls on the extension
line, a plurality of second rails each of that is shorter than the first rail are
intermittently fixed to the two side walls on the extension line, or a plurality of
metal brackets are intermittently fixed to the two side walls on the extension
30 line, and
wherein the second bottom plate is supported between the two side
walls, by being placed on a pair of the first rails that are fixed, a pair of the
second rails that are fixed, or a pair of the metal brackets that are fixed.

35 [Claim 3]

The ash discharger according to claim 2,
wherein the second bottom plate has a rectangular shape, and

wherein the number of the second bottom plates to be placed on and fixed to the first rails, the second rails, or the metal brackets, is selected for adjusting the length of the drain region, which is formed by one or more of the second bottom plates and the first bottom plate.

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[Claim 4]

The ash discharger according to claim 3,

wherein the first rail, the second rail, or the metal bracket have a substantially L-shaped cross section, and include a vertical surface along the side walls and a placing surface substantially perpendicular to the vertical surface, and

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wherein the second bottom plate is placed on and fixed to the placing surface.

15 [Claim 5]

The ash discharger according to any one of claims 1 to 4, further comprising a conveying device below the discharge port,

wherein the chute has a closed tubular shape that guides the incinerated ash from the discharge port to the conveying device.