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## APPARATUS FOR PREPARING CRYSTALS OF CREMATED REMAINS

### BACKGROUND OF THE INVENTION

#### 5 Field of the invention

The present invention relates to an apparatus for preparing crystals of cremated remains, and more particularly to an apparatus for preparing crystals of cremated remains, in which a dead person's powdered ashes  
10 collected after cremation are formed into crystals with a small bead-like shape through high-temperature processing, thereby facilitating storage and management of the ashes as well as removing disgust against the ashes and a unpleasant sight of the ashes during storage, and furthermore  
15 promoting the cremation practice so as to effectively alleviate the shortage of burial space, which is a serious social problem.

#### Description of the Prior Art

20 In general, eastern Confucian culture prefers burial to cremation of corpses due to the concept of filial duty in which a descendant should not impair a dead body of his/her ancestry, the theory of divination based on topography, and so on. The practice of this custom creates  
25 a tendency to choose wider and more aesthetically pleasing



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burial sites, which causes constant increase in acreage consumed by burial sites, and in turn, leads to the inevitable shortage of burial space and also a decrease in the amount of land usable for national growth and development. This phenomenon aggravates the shortage of burial space in countries having high population density and limited national territory such as Korea, and thus is considered as a serious social problem. Hence, as an approach to solve this problem, particularly, the Korean government has recently recommended cremation rather than burial. As a result, revision of Law on Funeral Affairs and a change in national spirit have caused the cremation practice to be spread rapidly.

According to the Korean cremation practice, powdered ashes obtained through cremation are scattered at a proper place such as a mountain, a river, and the like, thereby soothing the soul of the dead person (called "scattering of ashes"), or the powdered ashes are held in a container called a urn box (or an "ashes storage box") and then stored and cared for at a temple or a charnel house. The survivors periodically visit the temple or charnel house to perform ancestral rites. The practice of "scattering of ashes" has recently been stopped because it causes an environmental pollution problem and the surrounding people exhibit disgust against the ashes, and particularly it

causes the survivors to feel a lack of spiritual communication with the deceased. Accordingly, the latter cremation practice in which the urn box is laid or stored at a temple or charnel house is more favorably accepted in these days, and furthermore is strongly supported by the government.

However, conventionally, in the case of putting the ashes after cremation in an urn box and storing the urn box at the charnel house, it is difficult to collect and store the ashes. The ashes have an unappealing appearance, and thus other persons may exhibit disgust against ashes. Particularly, when the ashes collected after cremation are pulverized into powder, put into the urn box, and stored for a long time, harmful microbes such as molds, bacteria etc. are multiplied on an inner wall of the urn box due to a temperature difference between the inside and outside of the urn box. As a result, the powdered ashes decay.

In order to solve this problem, a technique for forming powdered ashes of the deceased into a globular crystal that neither gives any visual disgust nor decays for a long time is disclosed in Korean Patent Publication No. 2002-91149, entitled "Method and Apparatus for Preparing Crystals of Cremated Remains," and filed by and granted to the present applicant.

A construction of the apparatus for preparing crystals

of cremated remains disclosed in the Publication will be schematically described. Referring to FIGS. 1 and 2, the apparatus is comprised of an powdered ashes silo 41 into which powdered ashes collected after cremation are input, 5 and a crucible 42 (or a heating furnace) in which the powdered ashes input through the powdered ashes silo 41 are heated and melted at high temperature. The heating furnace 42 is supported on one side of a housing 46 via a support shaft 43. The support shaft 43 is provided with a rotating 10 handle 44 at one end thereof, by which the heating furnace 42 can be manipulated. Further, a heating mechanism 45 providing a heat source to the heating furnace is installed on one side of the heating furnace 42. Below a discharge port of the heating furnace 42 are provided passage members 15 51a and 51 in which molten ashes discharged through the heating furnace is crystallized into small bead-like crystals while cooled in air.

In the conventional apparatus for preparing a crystal of cremated remains having this construction, the powdered 20 ashes collected after cremation are input into the crucible through the powdered ashes silo, and heated and melted by a heating mechanism within a range from 1500°C to 3500°C. Then, the heating furnace is inclined to pour little by little the molten ashes onto the first inclined passage 25 member 51a. The molten ashes falling onto the first

passage member flows down along the second inclined passage member 51, and at the same time crystallized into a globular crystals while being cooled in air. These processed ash crystals move toward a ceramic powder cooling  
5 container 52 installed on a base, and then finally cooled here.

However, this conventional construction is so designed that the molten ashes discharged through the heating furnace is cooled in air while flowing down along the  
10 second inclined passage member, and as such the bead-like ash crystals are formed by themselves. Hence, the formed crystals have a non-uniform particle size, and particularly when a great volume of melt is poured at one time due to unskilled handling of the heating furnace, the molten ashes  
15 is conglomerated without being properly divided, and in this state proceeds through the passage members to the outside. Thus, it is impossible to get the desired small bead-like crystals. Therefore, in order to prevent the molten ashes, discharged through the heating furnace, from  
20 being conglomerated, the handle 44 should be repetitively manipulated to allow the molten ashes discharged from the heating furnace to flow out little by little. In this case, it takes too much time to form the crystals, which is not effective.

## SUMMARY OF THE INVENTION

Accordingly, the present invention has been made to solve these various problems occurring in the prior art, and an objective of the present invention is to provide an apparatus for preparing crystals of cremated remains, in which a spindle plate rotating at a high speed is provided below the discharge site of a heating furnace, centrifugal force is applied to molten ashes discharged from the heating furnace, so that it is possible to obtain crystals having a small bead-like shape and a uniform particle size without conglomeration, to remarkably shorten the time taken to form the ash crystals and to improve productivity.

It is another objective of the present invention to provide an apparatus for preparing crystals of cremated remains, in which a collecting container having a plurality of blowers is provided below a spindle plate, so that the ash crystals crystallized into a bead-like shape while passing through the spindle plate can be rapidly cooled and collected without surface cracks and conglomeration, and thus make it possible to further improve mass productivity and quality of the ash crystals.

In order to accomplish these objectives, there is provided an apparatus for preparing crystals of cremated remains, which has a powdered ashes silo into which

powdered ashes collected after cremation are input, and a heating furnace in which the powdered ashes input through the powdered ashes silo are heated and melted at high temperature, wherein the heating furnace is supported on one side of a housing via a support shaft, and the support shaft is provided with a rotating handle at one end thereof, by which the heating furnace can be manipulated, and a heating mechanism providing a heat source to the heating furnace is provided around the heating furnace, the apparatus includes:

a spindle plate provided below a discharge port of the heating furnace, applying centrifugal force to molten ashes discharged through the heating furnace while rotating at a high speed by means of a driving motor, and crystallizing the molten ashes into small bead-like ash crystals;

a vibration container having the spindle plate located therein, having one side opened to form a discharge port, having a central bottom through which a rotating shaft for connecting the spindle plate and the driving motor passes, connected with the rotating shaft so as to perform cam motion, and vibrating up and down according to rotation of the rotating shaft caused by the driving motor;

a support bracket having one end supported and fixed to the housing in order to support the spindle plate and the vibration container; and

a cooling collector located just below the vibration container supported by the support bracket, and having a plurality of blowers for cooling and collecting the ash crystals formed while passing through the spindle plate and  
5 the vibration container.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objectives, features and  
10 advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 schematically illustrates a construction of a conventional apparatus for preparing crystals of cremated  
15 remains;

FIG. 2 is a perspective view of FIG. 1;

FIGS. 3A, 3B and 3C are a perspective view, a front elevation view, and a side view illustrating an entire construction of an apparatus for preparing crystals of  
20 cremated remains in accordance with the present invention;

FIGS. 4A and 4B are a perspective view and a front elevation view showing internal main components extracted from an apparatus for preparing crystals of cremated remains in accordance with the present invention;

25 FIG. 5 is a partial magnified view illustrating the

angle adjustor and height adjustor of FIG. 4;

FIG. 6 is a side view illustrating a cooling collector of an apparatus preparing crystals of cremated remains in accordance with the present invention;

5        FIG. 7 is a partially magnified view illustrating the first blower of FIG. 6;

FIG. 8 is a partially magnified view illustrating the second blower of FIG. 6;

FIG. 9 is a partially magnified view illustrating the  
10    collecting container of FIG. 6;

FIG. 10 is a perspective view illustrating an operation state of main components of an apparatus for preparing crystals of cremated remains in accordance with the present invention;

15        FIG. 11 is an operational view illustrating an overall operation state of an apparatus for preparing crystals of cremated remains in accordance with the present invention;  
and

FIG. 12 illustrates another embodiment of an apparatus  
20    for preparing crystals of cremated remains in accordance with the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

25        Hereinafter, exemplary embodiments of the present

invention will be described with reference to the accompanying drawings. In the following description, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the  
5 subject matter of the present invention unclear.

FIGS. 3A, 3B and 3C are a perspective view, a front elevation view, and a side view illustrating an entire construction of an apparatus for preparing crystals of cremated remains in accordance with the present invention.  
10 First, the entire construction of an apparatus for preparing crystals of cremated remains will be schematically described.

Referring to FIGS. 3A through 3C, the apparatus for preparing crystals of cremated remains according to the  
15 present invention is comprised of a powdered ashes silo 41 into which powdered ashes collected after cremation are input, and a heating furnace 42 in which the powdered ashes input through the powdered ashes silo 41 are heated and melted at high temperature. The heating furnace 42 is  
20 supported on one side of a housing 46 via a support shaft 43. The support shaft 43 is provided with a rotating handle 44 at one end thereof, by which the heating furnace 42 can be manipulated as desired. A heating mechanism 45 providing a heat source to the heating furnace is installed  
25 on one side of the heating furnace 42.

Further, below a discharge port of the heating furnace 42 are provided a spindle plate 10, which crystallizes molten ashes discharged through the heating furnace 42 into small bead-like globoids by centrifugal action. The spindle plate 10 is located in and surrounded by a vibration container 20. The vibration container 20 is located above a support bracket 30 via a damper 22. The support bracket 30 is connected to a driving motor 24 for driving the spindle plate 10. A rotating shaft of the driving motor 24 passes through the vibration container 20 and simultaneously is coupled to a central bottom of the spindle plate 10.

Subsequently, a cooling collector 50, which cools and collects the ash crystals formed through the spindle plate 10 and vibration container 20, is provided just below the vibration container 20 supported by the support bracket 30. As illustrated in FIG. 3A, the cooling collector 50 is partially mounted to the housing 46, thereby serving to cool and collect the bead-like crystals discharged through the spindle plate 10 and vibration container 20.

Main components of the apparatus for preparing crystals of cremated remains according to the present invention will be described in greater detail with reference to FIGS. 4 through 10.

The spindle plate 10 is for forming the ash crystals

in a small bead-like shape, i.e. a spherical shape, by applying centrifugal force to the molten ashes discharged through the heating furnace 42, and has a disk structure as illustrated in FIG. 4A. The spindle plate 10 is located in  
5 the vibration container 20, passes through the bottom of the vibration container 20, is coupled to the rotating shaft 25 extending from the driving motor 24, and rotates at a high speed, as illustrated in FIG. 4B. Here, the spindle plate 10 is coated on its top surface with a Teflon  
10 resin so that the hot molten ashes discharged from the heating furnace easily slides outward through the influence of the centrifugal force without being stuck on the top surface of the spindle plate 10.

The vibration container 20 is a container, one side of  
15 which is opened to serve as a discharge port, and in which all edges where adjacent surfaces encounter each other are rounded in order to smoothly discharge the crystals which are formed through the spindle plate 10 in the shape of a bead having a uniform size. The vibration container 20 is  
20 formed at its central bottom with a through-hole, through which the rotating shaft 25 of the driving motor 24 for driving the spindle plate 10 passes. The vibration container 20 is supported and fixed above the support bracket 30 via the damper 22, and connected with the  
25 rotating shaft passing through the through-hole so as to be

able to perform cam motion, thereby discharging the ash crystals crystallized to some degree to the outside while vibrating up and down according to the rotation of the rotating shaft 25 caused by the driving motor 24. Here,  
5 the damper 22 preferably includes a compression spring, as illustrated in FIG. 4B. The same effect can be expected if a damping member made of a highly elastic rubber is employed as the damper 22.

A blower 35 is provided on the support bracket 30 on  
10 one side of the vibration container 20. An air duct 36 extends from the blower 35. A discharge leading end 360 of the extending air duct 36 is fixed to a rear wall of the vibration container 20, thereby providing a strong blowing force for cooling the ash crystals toward the spindle plate  
15 10.

As illustrated in FIG. 4B, the support bracket 30 is bent in an L shape. The support bracket 30 takes a cantilever shape in which only one end is fixed to the housing, and the leading upper portion of the other free  
20 end is provided with the vibration container 20 fixed through the damper 22 as described above. The fixed end of the support bracket 30 is coupled to the housing via an angle adjustor 70, and a height adjustor 80 is interposed between the angle adjustor 70 and the support bracket 30.  
25 Thus, the present invention can adjust an inclined angle of

the spindle plate 10 cooperating with the vibration container 20 as well as a distance spaced apart from the heating furnace 42 by means of operation of the angle adjustor 70 and height adjustor 80.

5       The angle adjustor 70 and height adjustor 80 will be described in detail with reference to FIG. 5.

Referring to FIG. 5, the angle adjustor 70 includes a lead screw 72, a driving motor 74 connected at a leading end of the lead screw 72, and a pivot plate 76 engaged with  
10 the lead screw 72. The angle adjustor 70 adjusts an angle of the support bracket 30 by driving the driving motor 74 according to switching operation of a control panel (not shown) to rotate the lead screw 72, and rotating the pivot plate 76 engaged with the lead screw 72 according to the  
15 rotation of the lead screw 72.

The height adjustor 80 is composed of a lead screw 82 having a handle 84, a saddle 83, and a cross slide 86 sliding on the saddle 83 in upward and downward directions, and adjusts a height of the support bracket while the cross  
20 slide 86 moves on the saddle 83 in upward and downward directions by movement of the lead screw 82 through rotation of the handle 84.

Meanwhile, FIGS. 6 through 9 illustrate a construction of a cooling collector applied to the present invention.  
25 FIG. 6 schematically illustrates an overall construction of

the cooling collector 50. As illustrated in these drawings, the cooling collector 50 includes a body 52 that has a predetermined volume and is opened at an upper portion thereof, and a plurality of blowers 54a, 54b and 5 54c installed to the body 52 in proper places.

Making a detailed description with reference to FIG. 6, the body 52 has the shape of a box that has a predetermined volume and is opened at an upper portion thereof. The body 52 is formed, on one side of an inner 10 bottom thereof, with a discharge port 520, which communicates with the ground and through which the ash crystals can be discharged, and with a round part 522, which is rounded in the shape of a smooth curve at a corner region of one side of the bottom of the body 52 adjacent to 15 the discharge port 520. The first blower 54a, which provides a strong blowing force toward the discharge port 520 and thereby causes an air fluidized bed to be formed on the bottom side, is installed at a corner region of the other side of the bottom of the body 52 opposite to the 20 round part 522. A partition 53 is installed in the body 52 on an extension line just above the discharge port of the body 52. The partition 53 is provided with the second blower 54b, which provides a strong blowing force in a direction opposite to the first blower 54a. Further, the 25 third blower 54c, which can provide an upward blowing force

in a direction perpendicular to a blowing direction of the first blower 54a to minimize a shock of each falling ash crystal, is installed at a corner region of the bottom of the body 52 adjacent to the first blower 54a.

5       Next, a collecting container 56, into which the ash crystals cooled and carried by the blowers 54 are collected, is coupled to the discharge port 520 of the body 52. A cover 57 having the shape of a grill net is installed at one side of the opened upper portion of the  
10 body 52, thereby covering the opened upper portion of the body 52 and allowing wind from the first blower 54a to exit outside. Four corners of the bottom of the body 52 are provided with casters 58 so as to allow the body to easily move.

15       Here, the first blower 54a is spread from the side thereof toward the inside of the body, as illustrated in FIG. 7. To this end, the first blower 54a is connected to a blowing nozzle 55 that opens one end of the first blower 54a in predetermined widthwise and lengthwise directions.  
20 Accordingly, the first blower 54a can provide a strong blowing force to the bottom of the body 52 through the blowing nozzle 55, thereby forming an air fluidized bed.

As in FIGS. 6 and 8, the second blower 54b is provided with a blowing nozzle 59 for adjusting a blowing angle on  
25 the side of an outlet thereof. The blowing nozzle 59 is

suspended on one side of the body 52 via a stud bolt S, so that it can adjust a blowing angle according to variation of fastening force of the stud bolt S.

Further, as illustrated in FIG. 9, the collecting  
5 container 56 is coupled to a pair of flanges 522 formed at opposite ends of the discharge port 520 so as to be able to be withdrawn in a widthwise direction of the body 52. Specifically, the collecting container 56 has a grip 560 attached on one side thereof. When grasping and pulling  
10 the grip 560 toward the outside of the body 52, the collecting container 56 can be simply separated from the body 52. Of course, the collecting container 56 may have the illustrated withdrawal type as well as a detachable type in which a separate detaching means is provided, and  
15 the withdrawn direction is not limited to only the illustrated type.

Hereinafter, operation and effects of the present invention constructed as described above will be described.

FIGS. 10 and 11 are operational views illustrating a  
20 process in which ash crystals are formed by an apparatus for preparing crystals of cremated remains of the present invention.

Referring to FIGS. 10 and 11, after powdered ashes collected after cremation are input into the heating  
25 furnace 42 through the powdered ashes silo, the heating

mechanism 45 (see FIG. 3B) installed around the heating furnace is driven to heat and completely melt the powdered ashes within a range from about 2000°C to about 3000°C. When the powdered ashes contained in the heating furnace 42  
5 are melted into a liquid state, the heating furnace 42 is inclined in one direction by manipulating the handle and pours the molten ashes onto the spindle plate 10, which rotates at a fixed speed by the driving motor, at a uniform speed, as in FIG. 10.

10 The molten ashes falling onto the spindle plate 10 is scattered outward from the spindle plate 10 by centrifugal force of the spindle plate 10, thereby being formed into small bead-like crystals having a uniform particle size. The ash crystals formed through this process move from an  
15 inner wall to a bottom of the vibration container 20 outside the spindle plate 10.

At this time, because the spindle plate 10 is coated with a Teflon resin throughout the top surface thereof, the hot molten ashes falling from the heating furnace can  
20 easily slide to the outside to which the centrifugal force is applied without sticking on the surface of the spindle plate 10. The air duct 36 supplying wind from the blower 35 is installed on one side of the vibration container 20, thereby helping to cool the ash crystals that are  
25 crystallized after passing through the spindle plate 10.

Simultaneously, the vibration container 20 is connected with the motor driving the spindle plate 10 so as to be able to perform cam motion, thereby vibrating up and down. Accordingly, the ash crystals that are crystallized after  
5 passing through the spindle plate 10 can be easily discharged in a direction of the discharge port 22 of the vibration container 20 without sticking on the surface of the vibration container.

Subsequently, the ash crystals R that are crystallized  
10 to some degree after passing through the spindle plate 10 and the vibration container 20 are input into the cooling collector 50 through the discharge port 22 of the vibration container 20.

In this manner, the ash crystals R input into the  
15 cooling collector 50 are again cooled by the influence of wind (see arrows for blowing direction) forcibly blown by the second blower 54b in the process of falling onto the bottom of the body by self-weight.

Here, the blowing nozzle 59 installed on the outlet  
20 side of the second blower 54b can be adjusted in its angle by adjusting the stud bolt S. Hence, when the angle of the blowing nozzle 59 is appropriately adjusted according to volume and self-weight of the ash crystals, the falling ash crystals R can be guided so as to be properly cooled and to  
25 fall onto the bottom without being scattered toward the

other sides by the influence of the blowing force of the second blower 54b.

In this manner, the ash crystals falling onto the inner bottom of the body after being cooled by the second  
5 blower 54b are again cooled and hardened by the first  
blower 54a that provides a strong blowing force toward the  
inner bottom of the body and forms an air fluidized bed and  
the third blower 54c that provides upward blowing force.  
At the same time, the ash crystals move toward the  
10 discharge port 520, which is formed on the other side of  
the inner bottom of the body, by means of influence of the  
blowing force of the first blower 54a. In this manner, the  
ash crystals R moving toward the discharge port 520 fall  
into the collecting container 56 through the influence of  
15 their self-weight at that position, and then are finally  
cooled in the collecting container 56.

Here, the third blower 54c is important in adjusting  
the intensity of the blowing force so as to have a blowing  
force weaker than that of the first blower 54a providing  
20 the blowing force in a direction intersected with the  
blowing direction of the third blower 54c. Thereby, the  
ash crystals R falling onto the inner bottom of the body  
can smoothly move to the discharge port 520 while  
maintaining a low height from the inner bottom of the body  
25 because they are prevented from colliding with the inner

bottom of the body and influenced by the first blower 54a.  
If the blowing force of the third blower 54c is stronger  
than that of the first blower 54a, the ash crystals R  
falling onto the inner bottom of the body are floated and  
5 dispersed above again by the influence of the third blower  
54c, so that they are not influenced by the blowing force  
of the first blower 54a, thereby failing to smoothly move  
to the discharge port.

Meanwhile, the wind caused by the first blower 54a  
10 carrying the ash crystals toward the discharge port 520  
exits outside through the round part 522 to the opening  
formed at the other side of the body (see the arrow  
direction of FIG. 11). At this time, the opening of the  
other side of the body 52 is covered by the cover 57 that  
15 has the shape of a grill net perforated with numerous  
holes. For this reason, the wind blown from the first  
blower 54a moves the ash crystals R to the discharge port  
520, and then rises along the round part 522 to exit  
outside through the cover. Some of the ash crystals, which  
20 do not fall as far as the discharge port 520 and tend to  
escape toward the opening by the influence of the blowing  
force, are caught by the cover, thus failing to be  
discharged. Hence, there is no chance that any of the ash  
crystals become lost during working, and can be completely  
25 collected.

As described above, according to the present invention, the molten ashes discharged from the heating furnace 42 by the centrifugal force caused by the spindle plate 10 and the vibration of the vibration container 20 are crystallized into small bead-like crystals having a uniform particle size without conglomeration, and the crystallized ash crystals are rapidly cooled by and collected into the cooling collector 50. Hence, it is possible to obtain a good quality of ash crystals. Further, it is possible to remarkably shorten the time taken to produce the ash crystals, so that the apparatus for preparing crystals of cremated remains of the present invention can obtain the good quality of ash crystals within a time faster than the conventional apparatus.

Meanwhile, FIG. 12 illustrates another embodiment of an apparatus for preparing crystals of cremated remains according to the present invention. This embodiment has a construction in which a technical means for continuously cooling a spindle plate is added around the spindle plate. Specifically, this embodiment is characterized in that, in order to prevent the spindle plate, influenced by high temperature, from being overheated and thus to prevent the molten ashes from sticking on the surface of the spindle plate, a cooling means for cooling the spindle plate is additionally installed around the spindle plate 10.

To be specific about the construction of this embodiment, as illustrated in FIG. 12, in order to cool the spindle plate 10, upper and lower spray nozzles 12a and 12b are installed above and below the spindle plate 10 separated from the spindle plate 10 by a predetermined distance, respectively. Among the upper and lower spray nozzles 12a and 12b, the upper spray nozzle 12a is connected with a pump (not shown) through a pipe, and the pump is connected with a cooling water storage tank (not shown) through another pipe. The lower spray nozzle 12b is connected with another cooling water storage tank 15 having an ultrasonic oscillator, so that cooling water changed into ultra fine particles can be ejected from the lower spray nozzle 12b.

Here, the upper spray nozzle 12a is preferably constructed so that an adjustor 13 is coupled to a fastening end of the nozzle in a spiral assembly type, a spray amount and a spray particle size of the cooling water sprayed through the nozzle can be adjusted according to the amount of tightening of the adjustor 13.

Further, the ejecting direction of the lower spray nozzle 12b is preferably adjust so as to allow a separate spray region A to be formed in such a manner that some of the sprayed particles ejected from the nozzle can be ejected toward the spindle plate 10, and others can be

ejected outside of the spindle plate 10. Then, the spindle plate 10 and the ash crystals R discharged through the spindle plate 10 can be simultaneously cooled.

According to this embodiment, as the cooling water is  
5 sprayed toward the spindle plate 10 as soon as the spindle plate 10 is driven, the spindle plate 10 can always maintain temperature of a proper level without influence of conduction heat caused by the hot molten ashes. As a result, the molten ashes can be easily scattered outside  
10 the spindle plate without sticking on the spindle plate 10, so that it is possible to obtain a better quality of ash crystals R.

According to the inventive apparatus for preparing crystals of cremated remains as described above, the  
15 spindle plate rotating at a high speed is provided below a discharge site of the heating furnace, centrifugal force is provided to the molten ashes discharged from the heating furnace, so that it is possible to obtain a better quality of ash crystals having a uniform particle size without  
20 conglomeration.

Further, the collecting container having a plurality of blowers is provided below the spindle plate, so that the ash crystals crystallized into a bead-like shape while passing through the spindle plate can be rapidly cooled and  
25 collected without surface cracks and conglomeration. Thus,

it is possible to remarkably shorten the time taken to obtain the ash crystals.

Although exemplary embodiments of the present invention has been described for illustrative purposes,  
5 those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

WHAT IS CLAIMED IS:

1. A apparatus for preparing crystals of cremated remains, having an powdered ashes silo (41) into which  
5 powdered ashes collected after cremation are input, and a heating furnace (42) in which the powdered ashes input through the powdered ashes silo (41) are heated and melted at high temperature, wherein the heating furnace (42) is supported on one side of a housing (46) via a support shaft  
10 (43), and the support shaft (43) is provided with a rotating handle (44) at one end thereof, by which the heating furnace (42) can be manipulated, and a heating mechanism (45) providing a heat source to the heating furnace is provided around the heating furnace (42), the  
15 apparatus comprising:

a spindle plate (10) provided below a discharge port of the heating furnace (42), applying centrifugal force to molten ashes discharged through the heating furnace (42) while rotating at a high speed by means of a driving motor,  
20 and crystallizing the molten ashes into small bead-like ash crystals;

a vibration container (20) having the spindle plate (10) located therein, having one side opened to form a discharge port (22), having a central bottom through which  
25 a rotating shaft (25) for connecting the spindle plate (10)

and the driving motor (24) passes, connected with the rotating shaft (25) so as to perform cam motion, and vibrating up and down according to rotation of the rotating shaft (25) caused by the driving motor (24);

5        a support bracket (30) having one end supported and fixed to the housing (46) in order to support the spindle plate (10) and the vibration container (20); and

         a cooling collector (50) located just below the vibration container (20) supported by the support bracket  
10    (30), and having a plurality of blowers (54a, 54b and 54c) for cooling and collecting the ash crystals formed while passing through the spindle plate (10) and the vibration container (20).

15        2. The apparatus as claimed in claim 1, wherein the spindle plate (10) is coated with a Teflon resin on an entire top surface thereof so that the hot molten ashes discharged from the heating furnace (42) can easily slide outside through the influence of the centrifugal force  
20    without sticking on the top surface.

         3. The apparatus as claimed in claim 1, wherein: the vibration container (20) is further provided with a blower  
         (35) on one side thereof; the blower (35) has an air duct  
25    (36) extending therefrom; and an discharge leading end

(360) of the air duct is fixed to a rear wall of the vibration container (20), so that a strong blowing force for cooling the ash crystals can be provided toward the spindle plate (10).

5

4. The apparatus as claimed in claim 1, further comprising upper and lower spray nozzles (12a and 12b) that are installed above and below the spindle plate (10) separated from the spindle plate (10) by a predetermined  
10 distance respectively, thereby spraying cooling water onto front and rear surfaces of the spindle plate (10).

5. The apparatus as claimed in claim 4, wherein among the upper and lower spray nozzles (12a and 12b), the upper  
15 spray nozzle (12a) is screwed onto an adjustor (13) at a fastening end thereof so as to adjust a spray amount and a particle size of the cooling water sprayed through the upper spray nozzle (12a).

20 6. The apparatus as claimed in claim 4, wherein the lower spray nozzle (12b) is connected with a cooling water storage tank (15) having an ultrasonic oscillator through a pipe so that cooling water changed into ultra fine particles is ejected from the lower spray nozzle (12b).

25

7. The apparatus as claimed in claim 1, wherein the support bracket (30) is fixed to one side of the housing via an angle adjustor (70) including a lead screw (72), a driving motor (74), and a pivot plate (76) engaged with the  
5 lead screw such that a slope thereof can be adjusted, and has a height adjustor (80) including a lead screw (82) having a handle, a saddle 83, and a cross slide (86) sliding on the saddle 83 in upward and downward directions interposed between the angle adjustor (70) and the support  
10 bracket (30) and thereby adjusts a height of the support bracket.

8. The apparatus as claimed in claim 1, wherein the vibration container (20) is supported and fixed above the  
15 support bracket (30) via a damper (22) so that vibration of the vibration container can be absorbed or damped through the damper (22).

9. The apparatus as claimed in claim 8, wherein the  
20 damper (22) is a compression spring.

10. The apparatus as claimed in claim 1, wherein the cooling collector (50) includes:

a body (52) having a shape of a box opened at an upper  
25 portion thereof, and formed with a discharge port (520)

passing therethrough on one side of an inner bottom thereof and with a round part 522 rounded in the shape of a smooth curve at a corner region of the bottom of the body 52 adjacent to the discharge port (520);

5        a first blower 54a installed at a corner region of the other side of the bottom of the body (52) opposite to the round part (522) and providing strong blowing force toward the inner bottom of the body (52);

10        a second blower (54b) installed at a partition (53) on an extension line just above the discharge port of the body and providing strong blowing force in a direction opposite to the first blower (54a) separated from the first blower (54a) by a predetermined height; and

15        a collecting container (56) removably coupled to the discharge port (520) in order to collect the ash crystals when the ash crystals, cooled and carried by the blowing force of the blowers, exit outside through the discharge port (520).

20        11. The apparatus as claimed in claim 10, wherein the opened upper portion of the body (52) is additionally provided on one side thereof with a grill shaped cover (57) so as to cover the opened upper portion and allow only a wind provided through the blowers to exit outside.

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12. The apparatus as claimed in claim 10, wherein the body (52) is additionally provided on the bottom thereof with casters so as to move the body with ease.

5        13. The apparatus as claimed in claim 10, wherein the partition (53) installed by the second blower (54b) is additionally provided with a blowing nozzle (59) for adjusting a blowing angle on an outlet side of the front thereof, the blowing nozzle (59) being suspended to the  
10 body via a stud bolt (S) so as to be adjusted in upward and downward angles according to a change in fastening force of the stud bolt (S).

14. The apparatus as claimed in claim 10, wherein the  
15 bottom of the corner region of the body adjacent to the first blower (54a) is additionally provided with a third blower (54c) that provides an upward blowing force in a direction perpendicular to the blowing direction of the first blower (54a) so as to be able to minimize a shock of  
20 the ash crystals falling onto the bottom of the body.

15. The apparatus as claimed in claim 14, wherein the third blower (54c) at least provides a weaker blowing force than that of the first blower (54a) provided in a direction  
25 perpendicular to that of the third blower so that the ash

crystals falling onto the bottom of the body can be prevented from colliding with the bottom and smoothly move to the discharge port (520) under influence of the blowing force of the first blower (54a).

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