Background

Eco incense Burner is design for separation of ash and particulate through the exhaust during the burning of incense papers. Also provide a good air circulation to facilitate complete burning process.

The Description

(Ref the attached drawing Figure 1)

Eco Incense Burner consist of :

- Cylindrical main body with top cover. Array of holes at the top end of main body for discharge of hot air (1)
- Assembly of a conical cover and a short exhaust pipe fix at middle portion of the main body (2)
- Assembly of burning tray, inner ring and a partition fixed at the middle portion of the main body (3)
- Ash collector at the bottom of the main body (4)

The two incense inlet opposite each other located at middle portion of the main body and a partition in between provide the multi-user function. An inner ring with a smaller diameter is fixed at the middle portion. The space between the inner ring and main body provide the run way for the air use at main chamber burning and the forming of vortex at the top portion. A double layer burning tray and a partition is fixed at the inner portion of the inner ring. An air inlet gap is located at the bottom part of the main body. This gap would then act as a fresh air inlet for the main chamber burning and continue burning of the un-burnt ash. An Ash-Collector with door open for ash collection.

Specification:

Material: SST 304,430

Burning Capacity: Standard paper size (160*130mm 100pcs) 300-500 stacks

Burning Rate: 6 stacks/10mins (Estimated depend on the type of paper)

Burning Chamber Size: 0.084m3

Ash Collector: 0.057m3
(Figure 1)

CLAIMS

1. ***ECO INCENSE BURNER comprising:***

A) Cylindrical Main Body:

- Main Cylindrical Body in Stainless steel with the top-end Cover. There are arrays of holes at the top end circumference Of the main body. The exhaust hot air from burning will then discharge through these holes.

- 2 nos. of wicket position at the centre portion of the main body, which allows different user to burn the incense paper from opposite direction.

- Air inlet gap round the circumference of the bottom portion of the main body

- An ash collection chamber with a conical base and a door is located at the lowest end of the main body.

B) Assembly of top end discharge system located at the top inner portion of the main body.

- Short cylindrical exhaust pipe fitted at the entre of a conical shape cover.

- When burning a vortex formation is formed by the interaction of hot exhaust and fresh air cyclonically rotate around the exhaust pipe and the bottom portion of the conical cover. In this vortex formation, a centrifugal force will then force all heavy particles to the side; by gravity it is then drop to the bottom. Thus, when the centre of this vortex reached the lowest end of the exhaust pipe, the exhaust hot air would thus be discharge out through this short exhaust pipe.

C) Assembly of burning chamber at the inner centre portion of the main body.

- Burning tray consist of the round shaped upper tray and a lower tray. A rectangular plate fitted at the top of the upper tray would act as a divider that split the tray into two burning portions. The primary burning process will occur at the top tray while the remaining or un-burn incense paper would then drop into the bottom tray which with the continue fresh

- air drawn in from the main body air inlet gap through the bottom tray would thus continue to burn. This secondary burning process would then

- burn all un-burn incense paper and the fine ash would then drop down to the ash-collecting compartment at the bottom of the main cylindrical body.

- This rounded burning tray is confine in a hollow cylindrical ring. The diameter of hollow cylindrical ring is smaller than the diameter of the main cylindrical body which provide a gap between the burning assembly and the main body. This gap is thus use for the fresh air supply channel for the primary burning at the top-burning tray.

D) Ash collector compartment:

- This ash collector compartment comes in conical shape's base to allow the ashes to drop into the centre. It also comes with a door for ease to clear the ash.

2. Component:

i) Main cylindrical body with arrays of holes at the top end circumference, two no's of wicket at the circumference of the center portion, air inlet gap round the circumference at the lower portion of the main body.
ii) Exhaust pipe
iii) Conical top cover
iv) Double layer (top & bottom) burning Tray
v) Partition
vi) Hollow cylindrical Inner Ring
vii) Triangular Stand

Eco-friendly Incense Burner

Field of Invention

[001] The present invention relates to an eco-friendly incense burner. During burning of incense paper, flying particles are separated out as hot air exits through an exhaust. Entry of fresh air into the burner allows for a complete burning process.

Background

[002] Incense burning has been practiced for a long time. However, burning of incense paper contributes to environmental pollution. Smoke from burning of the incense is unpleasant and is a health concern for some people. During burning, ashes and smoke particles fly free according to rising hot air and surrounding air currents. Sometimes, the burning is intense and naked flames pose a fire hazard. The effects of burning incense paper have affected the harmonious relations among some of the people in a multi-racial and multi-religious community.

[003] It can thus be seen that there is a need to design an eco-friendly burner to address the health and pollution concerns associated with burning of incense paper.

Summary

[004] The following presents a simplified summary to provide a basic understanding of the present invention.

[005] The present invention seeks to provide an eco-friendly incense burner to address air pollution and health concern of people in the community.

[006] In one embodiment, the present invention provides an eco-friendly incense burner comprising: a cylindrical shell made of stainless steel, is closed by a top cover and a bottom cover, wherein an array of holes are formed along a circumference of the cylindrical shell at a location below the top cover; a conical exhaust cover is fitted in the

cylindrical shell at a location below the array of holes, wherein the conical exhaust cover has a centre opening and an exhaust pipe is fitted in the centre opening; a circumferential air inlet formed along the cylindrical shell at a location near the bottom cover; a cylindrical ring having a diameter and a length smaller in dimensions than those of the cylindrical shell, with the cylindrical ring being fitted inside the cylindrical shell at a location substantially above the circumferential air inlet; a dual layer burn tray fitted across a bottom of the cylindrical ring, with the dual layer burn tray comprising an upper burn tray and a lower burn tray; and a wicket door on an opening on the cylindrical shell at a location substantially above the cylindrical ring for a user to insert incense paper on the upper burn tray. In use, during burning of the incense paper, fresh air is drawn in through the circumferential air inlet and interaction of the fresh air with hot air from the burning incense paper causes a vortex to form below the conical exhaust cover and around the exhaust pipe such that centrifugal forces throw flying ash and smoke particles outwardly to an inside surface of the cylindrical shell, thereby separating the ash and smoke particles that are relatively heavy from the swirling air whilst the hot air rises up through the exhaust pipe and exhausts out through the array of holes, and the ash and smoke particles fall by gravity onto the bottom cover together with ashes generated at the dual burn tray.

[007] Preferably, the array of holes is constituted by a row of holes. Preferably, two wicket doors are provided; preferably, a partition plate divides the upper burn tray into two portions to associate with the two wicket doors.

[008] Preferably, an ash chamber door is provided at an opening on the cylindrical shell near the bottom cover for clearing ash collected therein.

[009] Due to differences in diameters, a gap exists between the cylindrical shell and the cylindrical ring to allow fresh air to enter and to support burning of the incense paper.

[0010] Preferably, the bottom cover is conical.

[0011] Preferably, stands disposed below the bottom cover are provided to support the eco-friendly incense burner.

Brief Description of the Drawings

[0012] This invention will be described by way of non-limiting embodiments of the present invention, with reference to the accompanying drawings, in which:

[0013] FIG. 1 illustrates an eco-friendly incense burner according to an embodiment of the present invention; and

[0014] FIG. 2 illustrates airflow currents inside the above eco-friendly incense burner during use.

Detailed Description

[0015] One or more specific and alternative embodiments of the present invention will now be described with reference to the attached drawings. It shall be apparent to one skilled in the art, however, that this invention may be practised without such specific details. Some of the details may not be described at length so as not to obscure the invention.

[0016] FIG. 1 shows an eco-friendly incense burner **100** according to the present invention. As shown in FIG. 1, the eco-friendly incense burner **100** is made up of:

- a cylindrical body or shell **110** with a top cover **112**. An array of holes **114**, for example a row of holes, are formed along a circumference of the cylindrical shell **110** at a location below the top cover **112**;
- an exhaust assembly **120** of a conical exhaust cover **122** and an exhaust pipe **124** fitted at a centre of the conical exhaust cover; the exhaust assembly **120** is fixed inside the cylindrical shell **110** at a location below the array of holes **114**;

- an assembly **130** of a dual layer burn tray **132**, a cylindrical ring **134** and a partition plate **136**; the assembly **130** is located inside substantially a middle portion of the cylindrical shell **110**; and
- an ash collection chamber **160** at a bottom of the cylindrical shell **110** formed by a bottom cover **116** fitted across the bottom of the cylindrical shell **110**.

[0017] Also as shown in FIG. 1, there are two doors **150** provided to openings through the cylindrical shell **110**. The two doors **150** are located above the assembly **130** and allow users access to put incense paper into the eco-friendly incense burner **100**. Preferably, the doors **150** are located opposite to each other. With the doors **150** and partition plate **136**, the eco-friendly incense burner **100** provides for use by two or multiple users.

[0018] As shown in FIG. 1, the cylindrical ring **134** has a smaller diameter than that of the cylindrical shell **110**. The assembly **130** of the dual layer burn tray **132** fitted inside the cylindrical ring **134** and the partition plate **136** are fitted inside the cylindrical shell **110** at a location substantially above a circumferential air inlet **118** formed along the cylindrical shell **110**. The circumferential air inlet **118** allows fresh airflow to enter the eco-friendly incense burner **100** to support burning of incense paper disposed on the dual layer burn tray **132**. Due to difference in diameters, a space between the cylindrical ring **134** and the cylindrical shell **110** allows an additional fresh airflow to enter the eco-friendly incense burner **100** through a periphery of the dual layer burn tray **132**. A reader will appreciate that this additional fresh airflow contributes to formation of an air vortex inside an upper portion of the eco-friendly incense burner during use, as shown in FIG. 2 by arrows illustrating air currents.

[0019] The dual layer burn tray **132** is made up of an upper burn tray **132a** and a lower burn tray **132b**. Incense paper is placed on the upper burn tray **132a** for burning. After an initial process of burning, some of the burning and un-burnt incense paper drop through to the lower burn tray **132b** and burning continues with fresh air drawn through the circumferential air inlet **118**. Ashes produced from burning of the incense paper fall into the ash collection chamber **160**. An ash collection door **162** is provided to an opening on the cylindrical shell **110** for access into the ash collection chamber **160** for ease of clearing away the ashes.

[0020] During burning of the incense paper, hot air rises. The hot rising air interacts with the additional fresh air flowing through the periphery of the dual layer burn tray **132**; as a result, an air vortex is created inside an upper portion of the eco-friendly incense burner. The air vortex swirls below the conical exhaust cover **122** and around the exhaust pipe **124**. Centrifugal forces throw flying ash and smoke particles outwardly to the inside surface of the cylindrical shell **110**; these ash and smoke particles are relatively heavier than air then fall by gravity into the ash collection chamber **160**. The hot air swirling around the exhaust pipe **124**, now devoid of heavy ash and smoke particles, flows through the exhaust pipe **124** and exhausts out to the exterior through the array of holes **114**. With this eco-friendly incense burner **100**, pollution of air and health concerns associated with burning of incense paper are now addressed.

[0021] In one embodiment, the cylindrical shell **110** is made of stainless steel. Preferably, components of the eco-friendly incense burner **100** are made of stainless steel grades 304 or 430. Preferably, the bottom cover **116** is conically shaped to collect ashes at the bottom of the cylindrical shell **110**.

[0022] While specific embodiments have been described and illustrated, it is understood that many changes, modifications, variations and combinations thereof could be made to the present invention without departing from the scope of the present invention. For example, stands **170** are provided below the bottom cover **116** to support the eco-friendly incense burner.

CLAIMS:

1. An eco-friendly incense burner comprising:

a cylindrical shell made of stainless steel, is closed by a top cover and a bottom cover, with an array of holes being formed along a circumference of the cylindrical shell at a location below the top cover;

a conical exhaust cover is fitted in the cylindrical shell at a location below the array of holes, wherein the conical exhaust cover has a centre opening and an exhaust pipe is fitted in the centre opening;

a circumferential air inlet formed along the cylindrical shell at a location near the bottom cover;

a cylindrical ring having a diameter and a length smaller in dimensions than those of the cylindrical shell, with the cylindrical ring being fitted inside the cylindrical shell at a location substantially above the circumferential air inlet;

a dual layer burn tray fitted across a bottom of the cylindrical ring, with the dual layer burn tray comprising an upper burn tray and a lower burn tray; and

a wicket door on an opening on the cylindrical shell is disposed at a height substantially above the cylindrical ring for a user to insert incense paper on the upper burn tray;

so that during burning of the incense paper, fresh air is drawn in through the circumferential air inlet and interaction of the fresh air with hot air from the burning incense paper causes a vortex to form below the conical exhaust cover and around the exhaust pipe such that centrifugal forces throw flying ash and smoke particles outwardly to an inside surface of the cylindrical shell, thereby separating the ash and smoke particles that are relatively heavy from the swirling air whilst the hot air rises up through the exhaust pipe and exhausts out through the array of holes, and the ash and smoke particles fall by gravity onto the bottom cover together with ashes generated at the dual burn tray.

2. The eco-friendly incense burner according to claim 1, wherein the array of holes formed along the circumference of the cylindrical shell at a location below the top cover is constituted by a row of holes.

3. The eco-friendly incense burner according to claim 1 or 2 comprises two wicket doors.

4. The eco-friendly incense burner according to claim 3, further comprising a partition plate disposed on the upper burn tray for dividing the upper burn tray into two portions in association with the two wicket doors.

5. The eco-friendly incense burner according to any one of the preceding claims, further comprising an ash chamber door at an opening on the cylindrical shell near the bottom cover for clearing ash collected therein.

6. The eco-friendly incense burner according to any one of the preceding claims, wherein a gap between the cylindrical shell and the cylindrical ring allows fresh air to enter and to support burning of the incense paper.

7. The eco-friendly incense burner according to any one of the preceding claims, wherein the bottom cover is conical.

8. The eco-friendly incense burner according to any one of the preceding claims, further comprising stands disposed below the incense burner.