

## 2007 PAPER P3

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#### **A smoking device**

The Invention relates to smoking devices, and in particular for smoking devices for controlling generating smoke.

#### ***Background***

In the field of bee keeping, it is difficult opening and examining the hives; the bees can become agitated and sting an inspector ferociously.

A known technique of placating the bees is to make the area around the hive smoky. It is believed that the bees smell the smoke and gorge on the honey, which distracts them and causes them to become more docile.

A technique for generating smoke, which bee keepers have used for a number of years, is to light a tight bundles of damp straw. The lit, damp, smouldering straw is then wafted around to encourage the smoke into the hives.

However, it is not safe to hand-hold a burning straw, as burning embers can burn the user and damage protective clothing preventing the bees from stinging the user:

Furthermore it is difficult to direct the smoke into the hives, as the open nature of this method has no reliable means of directing the smoke into the hives.

The applicant has appreciated the difficulties in producing and directing smoke in a safe and reliable manner and has addressed the above disadvantages of the prior art.

#### ***Statement of Invention***

The invention provides a smoking device according to claim 1. Advantageously, the input air restricting means that it restricts the volume of ambient air drawn into the container. Such restriction limits the amount of oxygen available for combustion by the burning material, which causes the material to smoulder and produce smoke.

Furthermore, the chimney enables the generated smoke to be directed into the hives.

Preferably [feature of claim 2]. Preferably [feature of claim 3].

A horizontally–orientated tube advantageously reduced the amount of convected air drawn into the container, further controlling the smouldering.

In embodiment, [feature of claim 4]. The correct positioning of the air restricting means ensures an adequate air flow (e.g. if too low in the container, ash from the burning material may prevent airflow and prevent burning ash from being disturbed (e.g. if the air restricting means is about the grate).

In embodiment, the device further comprises [feature of claim 5].

Advantageously, additional air can be controllably input to the container to produce more smoke when desired.

Preferably, the airflow generating means comprises a bellows. Alternatively, the airflow generating means comprises a fan. The fan may be electrically or mechanically driven.

Preferably, [feature of claim 8].

Having an aligned output of the airflow generating means and air restricting means enables the airflow to efficiently pass into the container.

Preferably [feature of claim 9].

The cone concentrates the airflow into the container, which causes the air column to travel further into the container (making for a more even burn) and causes additional surrounding air to be drawn in, which improves the efficiency.

Preferably [feature of claim 10].

This enables the container to remain upright during use, whilst directing the smoke away from the user towards the hives.

Preferably [feature of claim 11].

The shield prevents the user from having to contact the (hot) container directly. Preferably the shield is in wire mesh surrounding the container.

Embodiments of the invention will now be described, by way of example only, and in which:

Figure 1 shows a perspective view of a smoking device according to the invention.

Figure 2 is a cross-section through the device of figure 1.

### ***Specific Description***

Referring to figure 1, the smoking device comprises a container 2, having an air restricting means, or inlet, 14 and a chimney 4 for directing the smoke generated inside the container towards the hives.

The container 2, which is preferably made from steel, has a handle, 12 and a hook 6 so that the container may be hung near the hives for ease of access. The container is surrounded by a shield B, which is shown here as a wire mesh.

Additionally, the device comprises a set of bellows attached to the container 2 and/or shield 8.

The operation of the smoking device will now be described with reference to figure 2 (with features common between figures 1 and 2 being given the same reference numerals).

The inside of the container is lined with a liner 16, which is a replaceable ventilated protective inner sleeve. Material for burning, for example straw, is placed upon a grate 18 (a ventilated false floor), which is supported on support legs 20; this raises the grate from the base of the container to permit air to flow around and under the material.

Once the material (not shown) is lit and placed on the grate 18, the chimney 4 is placed over the top of the container 2. The chimney 4 here forms part of the hinged lid (hinging at point 23). The chimney 4 enables the smoke to be concentrated into a narrow plume which can be directed into the hives. The chimney 4 is offset from the central axis of the container and faces away from the user, which enables the container to be held upright (to prevent disturbing the material) whilst still directing the smoke forward.

As the straw burns, most of the ash falls through the grate 18 to the bottom of the container.

The amount of ambient air which can enter the container is restricted by an air restriction means, here shown as an air inlet tube 14, which is the only inlet for the air. This ensures that the smoke is generated in a controlled manner by causing the straw to smoulder rather than burn (due to the relatively low amount of oxygen available). The device produces small amounts of smoke from the air provided through the air inlet tube.

However, more smoke can be generated by forcing air (and thus oxygen) into the container through the air inlet using an airflow generation means. This may, for example be done by squeezing bellows 10. The momentary increased airflow drives the accumulated smoke out of the chimney and also increases smouldering combustion, without producing flame.

The bellows comprises an inlet valve 24, through which air is sucked, and an outlet valve 26, through which air is blown. A spring 28 returns the bellows to an inflated position (as shown) after being squeezed. The outlet 26 of the bellows 10 is substantially aligned to the inlet 14 of the container.

A cone 30 having opposing open ends may be placed on the output 26 of the bellows to concentrate and increase the speed of the emitted air. Accordingly, the generated airflow travels further into the container, enabling a more equal burn of the material. Furthermore, the fast-flowing generated airflow draws in additional surrounding air which momentarily increases the volume of air (and thus oxygen), improving the efficiency.

The hinged lid, comprises the chimney 4 seals the container using a push-fit engagement, the lid being held in place by friction with the container. The hinged nature ensures that the lid and container do not become separated.

The cage, or shield, 8 (not shown in figure 2) comprises a wire mesh, preferably made from steel. Even though the container may become hot, the wire mesh shield 8 generally remains cooler so that the device may be handled by a user, (preferably wearing gloves) without the risk of burning.

Preferably, the container is made from copper. Preferably, the container is approx 30cm high.

An alternative to the bellows 10 is a fan, which could be electrically or mechanically driven to provide an airflow.

An alternative to the wire mesh shield is a U-shaped sheet of metal surrounding the container. However, this shield may become hot. The wire mesh is therefore preferable.

An alternative to the hinged lid is the provision of a screw-top lid. However, this may become too hot to unscrew safely after using the device, therefore the hinged lid is preferable.

### *Claims*

- 1) A smoking device for controllably generating smoke, comprising:

A container for containing material for burning, for generating smoke, the container comprising:

A chimney to direct the smoke from the burning material away from the container;  
and

Input air restricting means to restrict the ambient volume of air input to the container such that, in use, the burning material generates smoke.

- 2) The device according to claim 1, whereas the input air restricting means comprises an inlet hole in a wall of the container to permit air to flow into the container.
- 3) The device according to claim 2, whereas the input air restricting means further comprises a tube extending substantially horizontally from the wall of the container into the container.
- 4) A device according to claim 2 or 3, wherein the input air restricting means is located in a position of the wall of the container that is above the floor of the container and below a grate dispersed inside the container, on which the material for burning is placed.
- 5) A device according to any preceding claim, further comprising an air flow generating mean for controllably generating an air flow for inputting into the air restricting means, the air-flow generating means having an output for outputting an airflow.
- 6) A device according to claim 5, wherein the airflow generating means comprises bellows to generate the air flow.
- 7) A device according to claim 5, wherein the airflow generating means comprises a fan to generate the air flow.
- 8) A device according to claims 5, 6, or 7, wherein the outlet of the airflow generating means is substantially aligned to the air restricting means to enable the generated airflow to pass into the container.
- 9) A device according to claim 8, wherein a cone is disposed over the airflow generating means output, each opposing end of the cone having an opening, and wherein the narrower end of the cone is directed towards the air restricting means so as to concentrate the airflow being output by the airflow generating means.
- 10) A device according to any preceding claim, wherein the chimney is offset to direct the generated smoke away from a user of this device.

- 11) A device according to any preceding claim, further comprising a shield substantially surrounding the container to shield a user from heat generated from the burning material.
- 12) A smoking device substantially as herein described with reference to the accompanying description and drawings.

***Abstract***

The invention relates to smoking devices. Embodiments of the invention comprise a container in which burning material is placed. The container comprises a chimney through which the smoke generated by the burning material is output. An inlet restricts the amount of ambient air drawn into the container, which limits the amount of oxygen available for combustion, causing the material to smoulder and produce smoke. Additional smoke may be generated by directing additional airflow through the inlet into the container.

[drawings follow - 1 page]

\* \* \* \* \*

Fig. 1

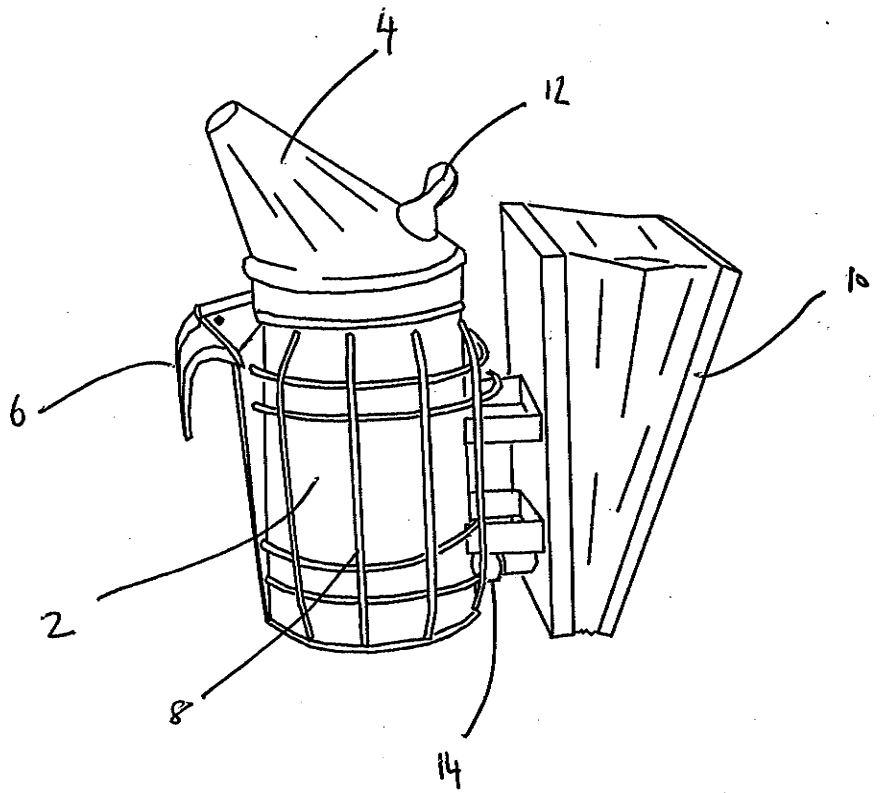
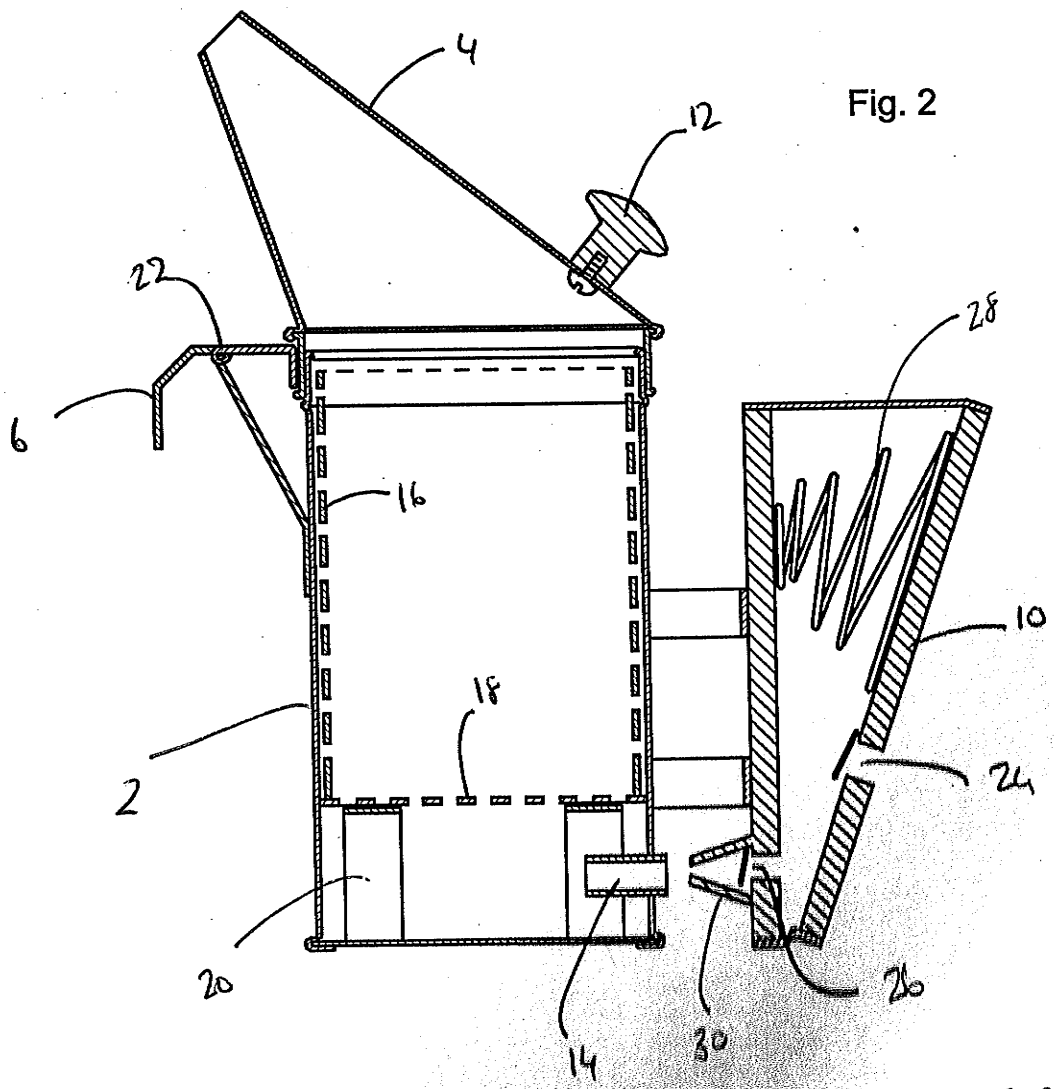


Fig. 2



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### SAMPLE SCRIPT B

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#### **Claims**

1. A smoker for producing smoke comprising:
  - a firebox arranged to enclose a combustible material;
  - a smoke outlet; and
  - an air inlet arranged to restrict convection air flow into the firebox.
2. A smoker according to claim 1, further comprising a grate above an enclosed air space in the firebox.
3. A smoker according to claim 2, wherein the air inlet is in a side wall region of the firebox below the grate.
4. A smoker according to any proceeding claim, wherein the air inlet is an elongate tube.
5. A smoker according to any preceding claim wherein the smoke outlet is a chimney which is offset relative to the firebox.
6. A smoker according to any preceding claim, further comprising an air driving mechanism arranged to drive air through the air inlet into the firebox.
7. A smoker according to claim 6, wherein the air driving mechanism comprises a tapered air outlet arranged to concentrate the air driven through the air inlet into the firebox.
8. A smoker according to any preceding claim further comprising a heat shield substantially or partially surrounding the firebox.
9. A smoker for smoking bee-hives comprising:
  - a firebox;
  - an air inlet; and
  - a smoke outlet which is offset relative to the central axis of the firebox.
10. A smoker as substantially described herein, with reference to the accompanying figures.

## ***Preamble***

### **A Smoker**

The present invention relates to a smoker, in particular but by no means limited to a smoker for smoking bee-hives.

Typically, it is often difficult to open and examine bee-hives. The bees can be disturbed and attack people and sometimes sting.

Usual methods of preventing bees from stinging can include the administration of carbon dioxide to the hive, which causes the bees to pass out.

Another popular technique is to make the beehive smoky. The bees smell the smoke and gorge on honey. This seems to distract them whilst the bee hive is examined.

Smoke is typically made by burning a tight bundle of damp straw with a blow torch. This can be wafted around, however it has a problem that it causes burning embers which can damage protective clothing.

According to an aspect of their invention there is provided a smoker for producing smoke comprising:

A firebox arranged to enclose a combustible material;

A smoke outlet; and

an air inlet arranged to restrict convection air flow into the firebox.

An advantage of such a smoker device is that embers from the combustible material are enclosed in the firebox thereby preventing damage to clothing.

A further benefit of the smoker device is that the air inlet restricts convection air flow into the firebox, this reduces the amount of oxygen available for combustion to produce a smouldering effect – which produces more smoke than a flame. Other combustion devices which uses a firebox are designed to allow more convective air – ie the air allowed into the firebox is not restricted – for example to produce more heat in a stove.

The smoker maximises the amount of smoke produced from the combustion. The smoker may comprise a grate above an enclosed air space in the firebox. The grate may be a ventilated floor such as a floor with holes. The grate may be a mesh or a series of bars.

The grate may be positioned substantially at the base region of the firebox.

An advantage of having a grate in the firebox is that ash from the combusting material can fall through the grate, to prevent clogging or hindering the combustion.

The air inlet may be positioned in a side wall region of the firebox. The air inlet may be positioned above a base of the firebox. The air inlet may be positioned below the grate.

A benefit of positioning the air inlet in a side wall region and above the base of the firebox is that it will not become clogged with ash. A benefit of positioning the air inlet below the grate is that the passage of air will not disturb the embers of the combustion material.



The air inlet may be a hole in a wall of the firebox, or an elongate tube.

The size of the air inlet may be such that it restricts convection air flow through the air inlet. The length of the elongate tube may be such that it restricts convection air flow through the air inlet into the firebox. The air inlet elongate tube may be positioned horizontally relative to the firebox.

The firebox may comprise only one air inlet.

An advantage of restricting connection air flow into the firebox through the air inlet is that the combustible material smoulders due to lack of oxygen, thereby producing more smoke.

The smoke outlet may be a chimney. The chimney may be offset relative to the firebox. The smoke outlet may be offset relative to the firebox.

The chimney may taper towards the smoke outlet.

An advantage of offsetting the smoke outlet from the firebox is that the smoke leaves the firebox at an angle – allowing the smoke to be directed whilst holding the firebox upright. The tapering of the chimney towards the smoke outlet helps to concentrate the smoke into a narrow plume which can be directed towards the hive.

The smoker may comprise an air driving mechanism. The air driving mechanism may be capable of driving air through the air inlet into the firebox. The air driving mechanism may be attached to the outside of the firebox. The air driving mechanism may comprise bellows, or may be an electrical or mechanical fan.

The air driving mechanism may comprise air tapered air outlet which tapers towards the air inlet.

A benefit of providing an air driving mechanism is that oxygen can be temporarily provided to the combustion by driving air through the air inlet into the firebox. This drives accumulated smoke out at the firebox and increases smouldering combustion, without producing flame.

The smoker may comprise a heat shield which substantially or partially surrounds the firebox. The heat shield may be a sheet of material or a cage.

An advantage of having a heat shield is that the firebox gets very hot and can burn the user, thus, the heat shield allows safer handling of the smoker.

The firebox may comprise a lid. The lid may be the chimney. The lid may be attached to the firebox.

The lid may be attached by a hinge or wire. The lid may be a screw fit, latch fit or friction fit. The lid may comprise a wire to aid removal.

A benefit of an attached lid is that it stays attached to the smoker and cannot get misplaced.

According to another aspect of the invention there is provided a smoker for smoking bee-hives comprising:

A firebox;

An air inlet; and

A smoke outlet which is offset relative to the central axis of the firebox.

Such a smoker has a benefit that a plume of smoke produced from the smoke outlet will be angled, thereby allowing the user to direct the smoke at the bee-hive whilst keeping the firebox upright.

It is understood that all optional and/or preferred features of one embodiment/aspect of the invention may be applied to all aspects/embodiments of the invention, where suitable.

### *Specific Description*

The invention will now be described in detail, by way of example only, with reference to a specific embodiment of the invention.

Figure 1 – illustrates a perspective view of a smoker according to an aspect of the invention; and

Figure 2 – shows a cross-sectional view of the smoker in figure 1.

With reference to Figures 1 and 2 a smoker 1 has an enclosed firebox 3 which is cylindrical in shape and made from copper. The firebox 3 has an enclosed base 5 and an open top 7 which is covered by a lid 9.

The lid 9 is a substantially cone-shaped chimney 11 which provides a smoke outlet hole 13 which is horizontally offset from the firebox 3.

The lid 9 is attached to the firebox 3 by a hinge 15. The lid 9 is held in place on the firebox 3 by friction fit between a rim of the lid 9 and a rim of the firebox 3.

The lid 9 has a handle 17 made of insulating material. The handle 17 is fixed to the lid 9 by a screw.

The outside of the firebox 3 comprises a hook 19 for hanging the smoker on a wall.

A heat shield 21 in the form of a cage is fitted to the outside of the firebox 3, which is best seen in figure 1. The heat shield 21 can be any suitable material to prevent burns and can be a U-shaped sheet of metal or cage.

The firebox 3 has a grate 23 inside the firebox 3 enclosure at a base region of the firebox 3. The grate 23 is a ventilated false floor on which the combustible material can rest.

The grate 23 is positioned above and defines an enclosed air space 25. The grate 23 is supported above the air space 25 by two support legs 27 fixed on the underside of the grate 23.

The firebox 3 also has a liner 29 which is a ventilated inner sleeve, which can be replaced when heat damage becomes severe. The liner 29 extends around the periphery of the inside wall of the firebox 3 from the grate 23 to the top 7.

The smoker 1 has a single air inlet tube 31 extending through a side wall of the firebox 3 in a region above the base 5 and below the grate 23.

The air inlet tube 31 is an elongate tube open at both ends.

A bellows 33 is attached to the smoker 1 via brackets 35. The bellows 33 are arranged to drive air through the air inlet tube 31 and into the firebox 3.

The bellows 33 comprises two boards 37 made of wood. The boards 37 are biased apart by a return spring 39. The boards define an air space 41 which is enclosed by a flexible gaiter 43.

The bellows 33 have an air inlet hole 45 and in air outlet hole 47 which are both controlled by one-way valves 49.

A cone 51 covers the bellows air outlet hole 47. The cone 51 is open at each end and it tapers towards the air inlet tube 31 of the smoker 1. There is a small gap 53 between the cone 51 and the air inlet tube 31.

In use, a combustible material such as straw would be set alight in the firebox 3 on the grate 23. The lid 9 is shut to enclose the top of the firebox 3 such that smoke is only directed through the chimney's 11 smoke outlet hole 13.

Ash from the combusting material falls through the grate 23 to prevent clogging.

The combustion material smoulders due to the lack of oxygen which is restricted by the air inlet tube 31 which is the only source of air for the combustion.

More smoke can be produced by pumping the bellows 33 which pushes/drives air through the air inlet tube 31 for more burning of combustible material temporarily. Accumulated smoke is pushed out through the chimney 11 and smouldering is increased without producing flame.

In this embodiment the smoker is 30 cm in height, however it is understood that any suitable size smoker can be used according to the invention.

### ***Abstract***

The present invention relates to a smoker 1 for producing smoke comprising: a firebox 3 arranged to enclose a combustible material; a smoke outlet 13; and an air inlet 31 arranged to restrict convection air flow into the firebox 3.

To be accompanied when published by Figure 2.

[Drawings follow – 1 page]

\* \* \* \* \*

Fig. 1

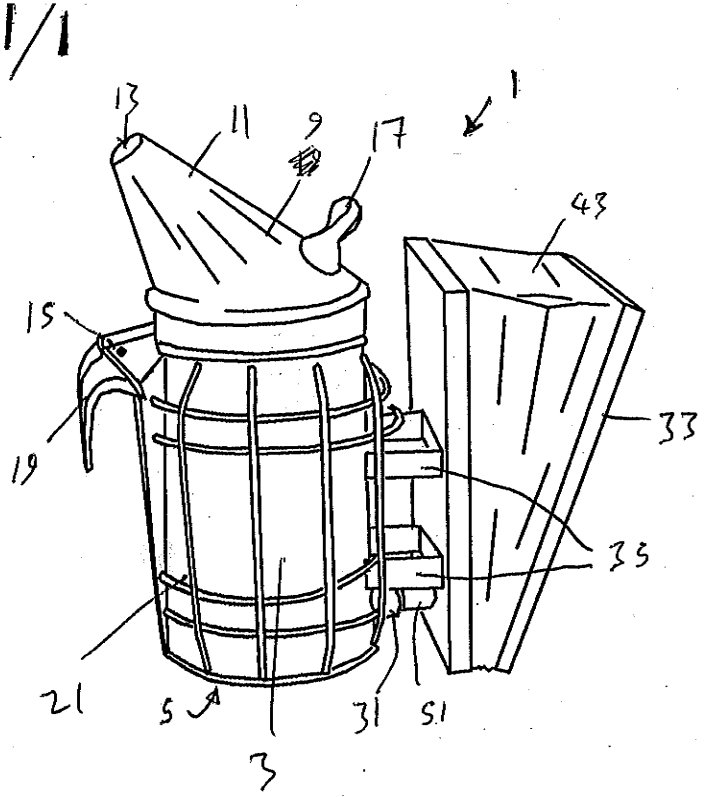
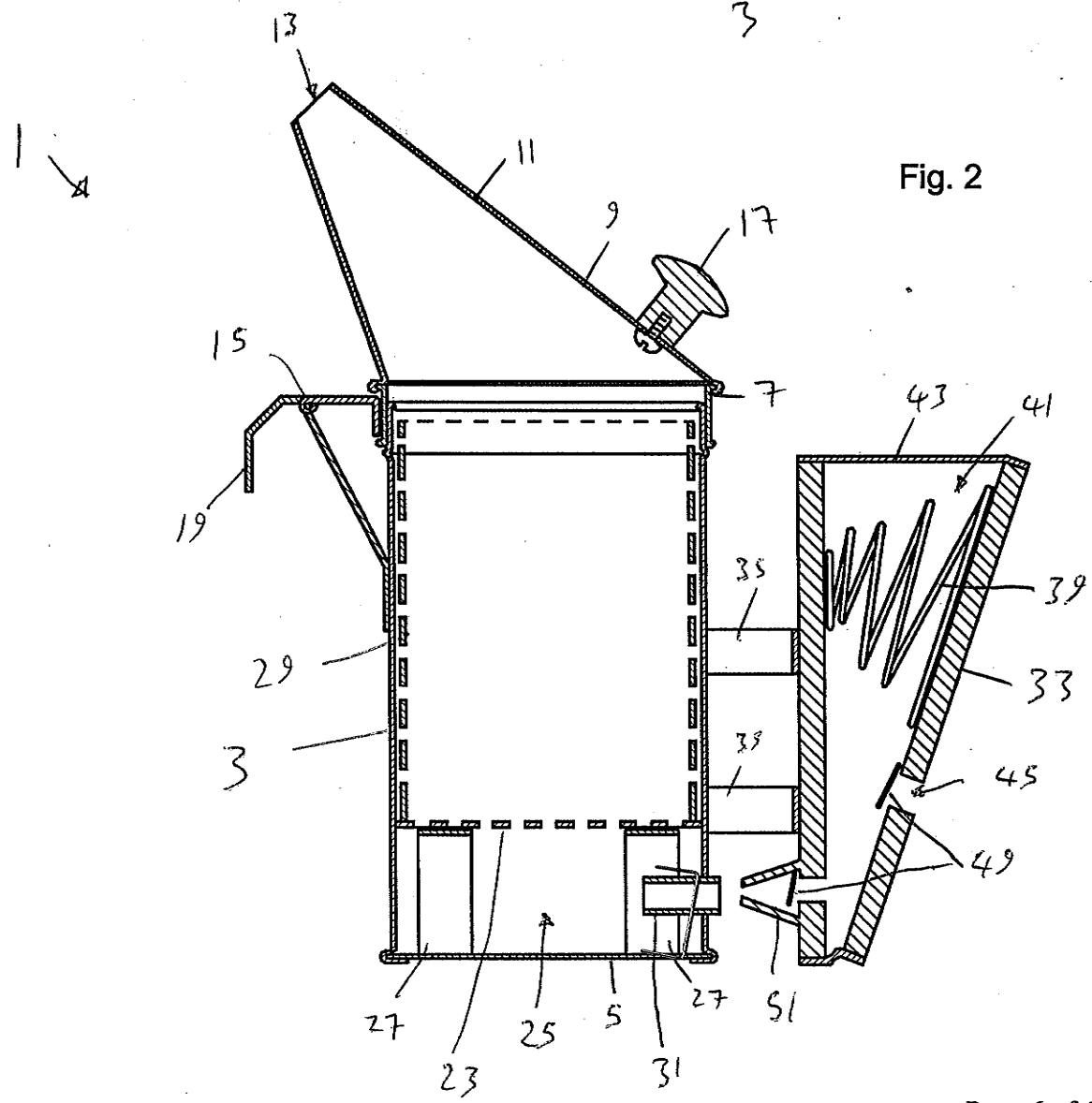


Fig. 2



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### SAMPLE SCRIPT C

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#### **SMOKE GENERATING DEVICE**

The present invention relates to a smoke generating device. Such a device may be used, for example, by a beekeeper to generate smoke around a bee-hive.

When a beekeeper needs to open a hive for examination, it is desirable to reduce the likelihood of receiving a bee sting. Known techniques include administering carbon dioxide to the hive, which causes the bees to pass out, and generating smoke around the hive, which makes the bees feed on honey contained in the hive, thereby distracting them.

To generate smoke, many beekeepers presently light a bundle of damp straw, which is wafted around the hive. The beekeeper may also attempt to blow some smoke into the hive. Problems associated with use of a straw bundle include the burning embers which the beekeeper has to be aware of, and the potential burning of the beekeeper's protective veil.

It would therefore be advantageous if smoke could be generated in such a way that the beekeeper is not exposed to burning embers and the flame itself. Further, it would be advantageous to generate smoke in a controlled manner, so as to allow a beekeeper to administer smoke around a hive as necessary.

Known devices for burning material, and thereby generating smoke, while protecting a user from burning embers and exposure to the flame, include garden incinerators and wood burning stoves. In a garden incinerator of known type, a grate is provided at the bottom of the incinerator such that embers can fall through the grate. The incinerator is raised off the ground on legs such that the grate is open to the air below, and holes are provided in the sides of the incinerator to encourage the flow of air into the incinerator. Such an incinerator has a removable lid with a central, vertical chimney.

In a wood burning stove of known type, holes are provided at the bottom of the stove to encourage the flow of air into the stove. Such a stove can be provided with a chimney in a particular orientation to suit the room in which it is fitted.

The provision of holes in such incinerators and stoves encourages air flow, and thus plentiful airflow reduces smoking to a minimum. These devices do not afford control over the generation of smoke.

According to the present invention, there is provided a (insert text of claim 1).

Such a device contains the flame of the burning material and does not expose a user to burning ash or embers. Further, the device allows a user to control the amount of smoke generated by controlling the amount of air entering the holding chamber of the device, that is controlling the amount of air

available to the material burning within the holding chamber. This allows a user to ensure that the material is smouldering rather than burning.

Advantageously, the device further comprises grate means which is located below the holding chamber when the device is oriented for use. This grate means is spaced apart from the lower surface of the device (the lower surface being the lower surface when the device is oriented for use). This creates a waste chamber between the grate and the lower surface such that ash created by burning material can fall through the grate into the waste chamber.

The inlet of the device may be located between the lower surface of the device and the grate means. This prevents the airflow becoming clogged by ash in the waste chamber, or disturbing the burning ash in the holding chamber.

The device may comprise a lid, thereby allowing easy access to the holding chamber, and this lid may form chimney means for enabling the direction of the smoke expelled therefrom to be controlled. The outlet of the chimney means may be offset from a central axis of the device, thereby facilitating ease of use since the device can be held generally upright while the smoke plume will be expelled at an angle. Holding the device generally upright is desirable since otherwise the material in the holding chamber can be disturbed, which reduces the efficiency of the device and may cause the flame to be distinguished. The lid may be connected to the device by a hinge.

Advantageously, the air flow control means comprises bellow means. The outlet of the bellow means is connectable to the inlet of the device. The bellow means may be arranged so as to allow air to be expelled therefrom when the bellow means are depressed, with the bellow means automatically re-inflating ready for subsequent use.

The outlet of the bellow means may be shaped such that the air expelled therefrom is concentrated into an air column. In this respect, the outlet of the bellow means may be conical with the narrow end being distal to the bellow means. The air column created travels further into the device and draws in additional surrounding air, which increases the volume of air delivered to the holding chamber.

As an alternative to bellow means, the air flow control means may comprise a fan.

An embodiment of the present invention will now be described, by way of example only, and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a smoke generating device according to an embodiment of the present invention; and

Figure 2 is a cross-sectional view through the device of Figure 1.

Referring first to Figure 1, the smoke generating device 1 comprises a main compartment 3, and a lid 5 formed into a chimney 7. The main compartment 3 is connected to bellows 9 via brackets 11. The outlet 13 of the bellows 9 is in fluid communication with the inlet 15 of the compartment 3. The device further comprises a hook 17 and a handle 19. The device 1 is housed within a cage or shield 21.

Referring now to Figure 2, which is a cross-section of the device 1 shown in figure 1, it can be seen that the main compartment 3 is divided into two inner chambers 23 and 25. Chamber 23 is located above chamber 25 as the device 1 is oriented for use as shown in the figures. Chambers 23 and 25 are separated by a grate 27, which is supported above the lower surface 29 of the device by legs 31.

Chamber 23 is provided with a liner 33. The bellows 9 comprises two walls 35, 37 which are sealed at their upper end by a gaiter 39. An inlet valve 41 is provided in wall 35, and an outlet valve 43 is provided in wall 37. Outlet valve 43 is located within the bellows outlet 13.

In use, the material to be burned (eg straw) is placed in chamber 23, where it is held. When lit, the smoke created is channelled through the chimney 7 such that it is concentrated into a narrow plume which can be directed as required. As can be seen from figure 2, the outlet of the chimney 7 is offset from the central axis X of the device 1. This allows the smoke to exit the chimney 7 at an angle while the device 1 remains generally upright (ie oriented as shown in the figures). The lower surface of chamber 23 comprises the grate 27, which allows the ash created by the burning material to fall into the chamber 25. This waste material does thus not impede the burning of material in chamber 23. Chamber 23 is provided with a liner 33, which is ventilated and acts as a protective inner sleeve for the device 1. The liner 33 can be replaced when the heat damage thereto becomes severe, and thus prolongs the life of the device 1.

The bellows 9 allow a controlled flow of air to enter the main compartment 3 and chambers, 23, 25 of the device 1, thereby enabling the smoke generated by the device 1 to be controlled, as the material can be caused to smoulder rather than burn. The inlet valve 41 of bellows 9 allows air to enter the bellows 9, while the outlet valve 43 enables air to be expelled from the bellows 9 through outlet 13, and into the main compartment 3 and chambers 23, 25 of the device through inlet 15. Bellows 9 are fitted with a return spring 45 which biases the bellows 9 in an open condition, and as such can be depressed such that the walls 35, 37 are brought together which acts to expel air from the bellows 9 into the main compartment 3 and chambers 23, 25. Return spring 45 forces the bellows 9 to automatically reinflate ready for subsequent use. In this way, small amounts of smoke can be generated from the air provided through the inlet 15. More smoke can be generated by squeezing the bellows 9 together a few times to increase temporarily the amount of oxygen and flow of air in the main compartment 3 and chambers 23, 25. This action also drives smoke accumulated in the chamber 23 out of the chimney 7 and further increases smouldering combustion without producing flame.

The compartment 3 is housed in a cage 21. In use, the compartment 3 gets very hot and as such cannot be easily handled. The provision of cage 21 allows the device 1 to be handled as the cage generally remains cool enough to not cause a severe burn if touched, particularly if the user is wearing suitable gloves.

The device 1 is fitted with a hook 17 which allows the device 1 to be hung from a suitable location when not in use. For example, the device 1 could be hung from the wall of a bee house so that it is always to hand.

The device 1 is also fitted with a handle 19, made of insulating material, which allows the device to be easily handled by a user.

As can be seen from Figure 2, the inlet 15 to the main compartment 3 is located in chamber 25, substantially part way between the lower surface 29 of device 1 and the grate 27 which separates compartments 23, 25. This allows optimum air flow from bellows 9 into the main compartment 3. If the inlet 15 were located adjacent the lower surface 29 the air flow could become clogged by waste ash in chamber 27. On the other hand, if inlet 15 were located above grate 27, in chamber 23, the burning ash would be disturbed. Location of the inlet 15 between these two extreme positions provides optimum air flow.

The lid 5 is hinged to the main compartment 3, but may alternatively be pushed on to create a friction fit, or may be screwed on.

The main compartment may be made of copper, steel, or any other suitable metal or material.

The cage 21 may be of any suitable form and made of any suitable material. It may, for example, be a wire mesh made from stainless steel. It may alternatively take the form of a u-shaped sheet of metal which surrounds compartment 3.

Although the specific embodiment described comprises bellows 9, other means suitable for controlling the flow of air into compartment 3 could alternatively be used. For example, a mechanical or electrical fan could be used to provide an air flow into inlet 15 in a controlled manner.

The outlet 13 of the bellows is shaped so as to concentrate and increase the velocity of the air emitted from the bellows 9. This acts to create an air column which travels further into the compartment 3, and draws in additional surrounding air which increases the volume of air delivered to the compartment 3. In the embodiment described, the bellows outlet 13 is conical with the narrower end of the cone distal to the bellows 9 (ie the narrower end of the cone is connected to the inlet 15 of the compartment 3). However, any other form of outlet 15 suitable for creating an air column in this way may be used.

### *Claims*

1. A smoke generating device comprising:
  - A holding chamber for holding material to be burned to generate smoke;
  - An inlet for allowing air to be introduced to the holding chamber; and
  - Air flow control means for controlling the flow of air into the holding chamber, thereby enabling the generation of smoke in a controlled manner.
2. A smoke generating device according to claim 1 further comprising grate means located below the holding chamber in use and spaced apart from the lower surface of the device in use, thereby creating a waste chamber such that, in use, ash created by burning material can fall through the grate into the waste chamber.
3. A smoke generating device according to claim 2 in which the inlet is located between the lower surface of the device and the grate means.
4. A smoke generating device according to any one of claims 1 to 3, in which the device further comprises a lid, the lid forming chimney means for enabling the direction of the smoke expelled therefrom to be controlled.
5. A smoke generating device according to claim 4, wherein the chimney means has an outlet which is offset from a central axis of the device.
6. A smoke generating device according to claim 4 or claim 5, in which the lid is connected to the device by a hinge.
7. A smoke generating device according to any preceding claim, in which the air flow control means comprises bellow means with the outlet thereof connectable to the inlet of the device.



8. A smoke generating device according to claim 7, in which the outlet of the bellow means is shaped such that the air expelled therefrom is concentrated into an air column.
9. A smoke generating device according to claim 8, in which the outlet of the bellow means is conical with the narrow end of the cone being distal to the bellow means.
10. A smoke generating device according to any one of claims 1 to 6, in which the air flow control means comprises a fan.
11. A smoke generating device substantially as described herein with reference to the accompanying drawings.

***Abstract***

**SMOKE GENERATING DEVICE**

A smoke generating device (1) comprising a holding chamber (23) for holding material to be burned to generate smoke and an inlet (15) to allow air to be introduced to the holding chamber (23). The device (1) further comprises air flow control means (9) for controlling the flow of air into the holding chamber (23), thereby enabling the generation of smoke in a controlled manner.

[Drawings follow – 1 page]

\* \* \* \* \*

Fig. 1

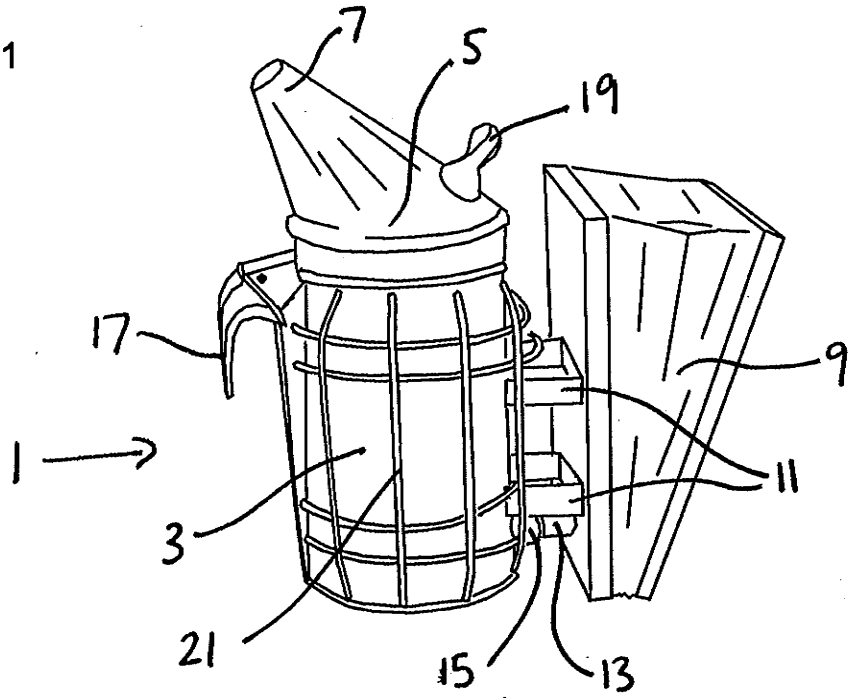


Fig. 2

