Dec. 25, 1962 W. W. HICKS ET AL 3,070,100

ION CONTROLLED INHALING DEVICE

Filed March 25, 1957 2 Sheets-Sheet 1

FIG_1_

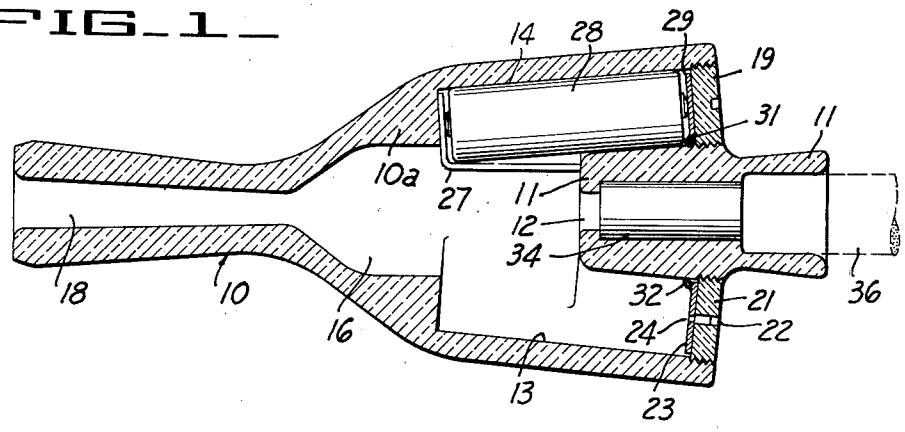


FIG_2_

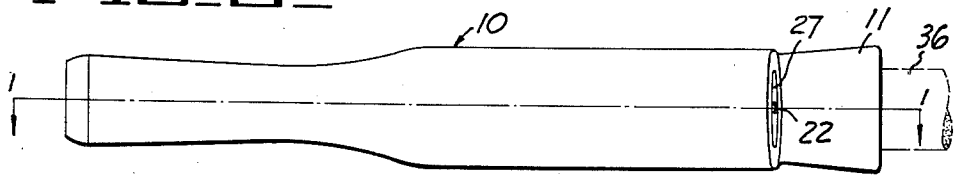


FIG_4_

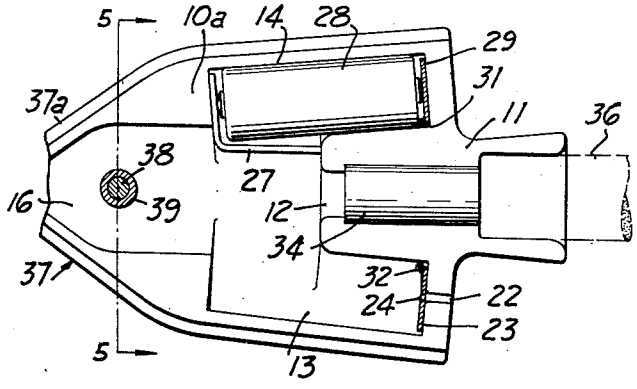
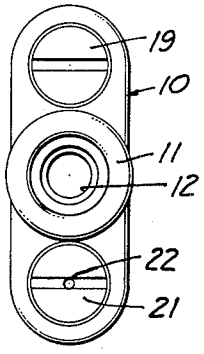


FIG_3_



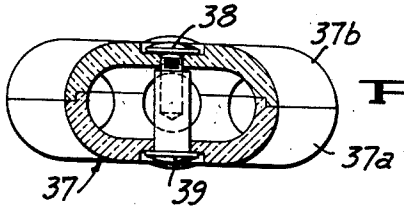


FIG_5_

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FIG_6_

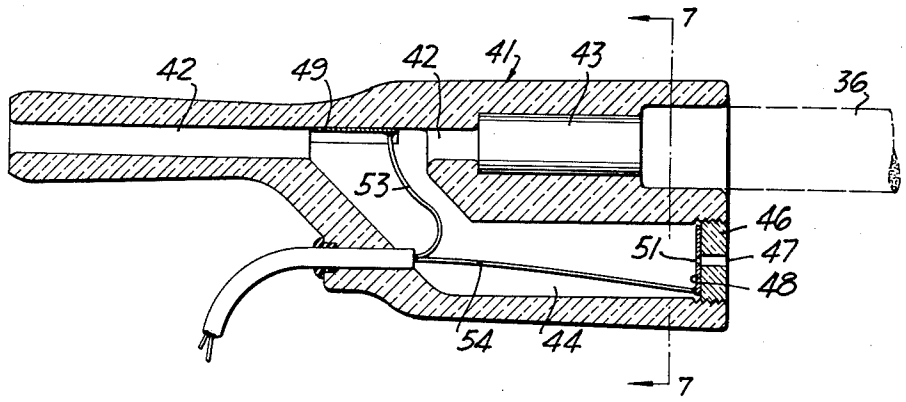
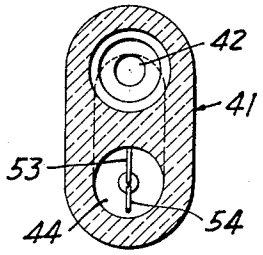


FIG_7_



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ION CONTROLLED INHALING DEVICE

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Filed Mar. 25, 1957, Ser. No. 648,238
4 Claims. (Cl. 131—200)

This invention relates generally to an inhaling device and more particularly to an ion controlled inhaling device.

It has been found that tobacco smoke causes irritation of the throat and other membranes which come in contact with smoke particles within the smoke. By passing the smoke through an area containing an excess of negative ions, it has been found that any smoke particles carrying positive charges are neutralized and other neutral smoke particles are negatively charged. It is believed that smoke so treated is less irritating to the throat and other membranes.

In general, it is an object of the present invention to provide an inhaling device in which the inhaled air is passed through an excess of ions of one charge.

Another object of the present invention is to provide an inhaling device of the above character which is particularly useful for neutralizing positively charged smoke particles and for placing a negative charge on the smoke particles carrying no charge.

Another object of the invention is to provide an ion controlled inhaling device of the above character which serves to reduce irritation of the throat and other membranes.

Another object of the invention is to provide an ion controlled inhaling device of the above character which is relatively light and compact.

Another object of the invention is to provide an ion controlled inhaling device of the above character which is self-contained.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment has been set forth in detail in conjunction with the accompanying drawing.

Referring to the drawing:

FIGURE 1 is a cross sectional view taken along the line 1—1 of FIGURE 2 showing an ion controlled inhaling device embodying the present invention.

FIGURE 2 is a side elevational view of the inhaling device shown in FIGURE 1.

FIGURE 3 is a front elevational view of the inhaling device shown in FIGURE 1.

FIGURE 4 is a partial view of another embodiment of our inhaling device with one section removed.

FIGURE 5 is a cross sectional view taken along the line 5—5 of FIGURE 4.

FIGURE 6 is a cross sectional view of another inhaling device embodying the present invention.

FIGURE 7 is a front elevational view of the inhaling device shown in FIGURE 6.

In accordance with the present invention, we provide an inhaling device such as a cigarette holder having a passage therein for the flow of the smoke which is drawn from the lighted cigarette through the cigarette holder. Radioactive means is mounted within the holder on one side of the passage for ionizing the air in the vicinity of the radioactive source to produce positive and negative ions. The radioactive means also serves as an electrode and carries a charge of one sign or polarity. An additional electrode is mounted within the holder on the opposite side of the passage and carries a charge of opposite

sign or polarity. The electrostatic field between the electrodes separates the ions as they are created by the radioactive means. The ions of the sign opposite that of the sign of the charge on the radioactive means are collected by the radioactive means and the ions of the same sign as that of the charge of the radioactive means are repulsed from the radioactive means and follow the electrostatic flux lines towards the additional electrode and pass through the smoke stream which is drawn through the cigarette holder. The ions drawn through the smoke stream neutralize smoke particles of opposite sign and place a charge of the same sign on smoke particles.

The embodiment of our invention shown in FIGURES 1, 2 and 3 of the drawing is shown in the form of a cigarette holder and consists of a body **10** of one piece construction and formed from a suitable material such as hard rubber or plastic. The body **10** is provided with a centrally disposed cylindrical extension **11** which forms an inlet passage **12**. The body is formed with a pair of recesses **13** and **14** disposed on opposite sides of the central passage **12** and opening into a central passage or chamber **16**. The body is also formed with a stem-like portion that has an outlet passage **18** which communicates with the chamber **16**. The inlets to each of the recesses **13** and **14** are normally closed by screw plugs **19** and **21**. Screw plug **21** is provided with a bleed orifice **22** for a purpose hereinafter described.

Suitable means is mounted within the body for ionizing at least a portion of the air within the body of the cigarette holder. Such means can consist of a radioactive member **23** mounted in the plug **21**. The radioactive member can be comprised of any suitable radioactive material, as for example, tritium foil, manufactured by the U.S. Radium Corporation of New York, New York. In this instance, the radioactive member **23** is provided with a bleed orifice **24** which is in registration with the orifice **22** in the screw plug **21**.

As is well known to those skilled in the art, the radioactive member **23** if formed of tritium foil, emits soft beta particles which serve to ionize the air in the immediate vicinity of the radioactive member to cause the production of positive and negative ions within the recess **13** and the chamber **16**.

It will be noted that the radioactive member **23** is generally disposed on one side of the central passage **16** which carries the smoke laden air. The radioactive member **23** serves as an electrode as hereinafter described. An additional electrode **27** is mounted within the body and is generally disposed on the opposite side of the passage **16** away from the radioactive member **23**. The electrode **27** can be formed of any suitable material such as stainless steel and can be mounted within the body in any suitable manner such as having one end fixed to the extension **11** and the other end mounted adjacent an abutment **10***a* formed on the body **10**.

To create a suitable electrostatic field between the electrode **27** and the radioactive member **23**, a battery **28** is mounted within the recess **14**. The battery can be of any suitable type such as the sub-miniature, 95 volt solid electrolyte battery manufactured by the General Electric Company. One terminal of the battery engages the electrode **27** and the other terminal of the battery engages a contact plate **29** carried by the plug **19**. The contact plate **29** engages a contact **31** which is connected by a conductor (not shown) to a contact **32**. Contact **32** is engaged by the radioactive metallic foil member **23** carried by the plug **21**.

As shown, the central passage **12** has been formed to receive a conventional filter **34** of the type used in cigarette holders. The outer end of the passage **12** has been formed to receive the end of a cigarette **36**.

Operation of this embodiment of our invention may now be briefly described as follows: Let it be assumed that the battery **28** is mounted in the recess **14** in such a manner that a positive charge is placed on the electrode **27** and that a negative charge is placed on the radioactive member **23**. As suction is applied to the passage **18** and smoke is drawn from the cigarette **36** through the inlet passage **12**, the smoke will flow through passages **16** and **18**.

It is generally understood that smoke particles usually carry no charge. However, it is very likely that air drawn through the cigarette will contain particles which carry a positive charge and for that reason the smoke from the cigarette may include positively charged particles.

The radioactive source in this case continuously emits soft beta particles which serve to ionize the air in a limited zone adjacent the radioactive source. The electrostatic field between the radioactive source and the electrode **27** serves to immediately separate the ions when they are created. When the radioactive member **23** carries a negative charge and the additional electrode carries a positive charge, the negatively charged radioactive member repulses the negative ions and collects the positive ions. The repulsed negative ions follow the electrostatic flux lines towards the additional positive electrode. At the same time that smoke is drawn from the cigarette **36** into the passage **16**, a small quantity of air is drawn through the bleed orifices **22** and **24** and help to carry the negative ions towards the additional electrode **27**. However, during their travel towards the additional electrode, the negative ions are intercepted by the smoke stream in the passage **16**. The intercepted negative ions neutralize any positively charged smoke particles and negatively charge any neutral smoke particles within the smoke stream. Because of this action of the negative ions, the smoke stream drawn into the outlet passage **18** and into the mouth, carries no positively charged particles and an excess of negatively charged particles. It is believed that such smoke is much less irritating to the throat and other sensitive membranes coming in contact with the smoke.

Another embodiment of our invention is shown in FIGURES 4 and 5 and is substantially identical to the embodiment of our invention shown in FIGURES 1, 2 and 3 except that the body **37** is formed in two sections **37***a* and **37***b*. The sections **37***a* and **37***b* are fastened together by threaded male and female members **38** and **39**. Since the sections **37***a* and **37***b* can be easily separated, no special means must be provided such as the plug **19** in FIGURE 1 for insertion and removal of the battery **28**. Operation of this embodiment of our device is substantially identical to that shown in FIGURES 1, 2 and 3.

Another embodiment of our invention is shown in FIGURES 6 and 7 and consists of a cigarette holder having a body **41** having a passage **42** extending the length thereof. A filter **43** of conventional type is mounted within the passage. The body is formed to provide a second passage **44** which in this instance has been provided below the passage **42**. The passage **44** is normally closed by a screw plug **46** having a bleed orifice **47**. Ion generating means of the type hereinbefore described is mounted within the passage **44** and consists of a radioactive member **48** mounted on the screw plug **46** and provided with an orifice **51**. The radioactive member **48** and an additional electrode **49** are connected to a suitable power supply (not shown) for creating an electrostatic field between the electrode **49** and the radioactive member for a purpose hereinafter described. The power supply may be of the type hereinbefore described and may be carried on the person of the wearer. Conductors **53** and **54** leading from the power supply or battery are connected to the collecting electrode **49** and the radioactive member **48** as shown.

Operation of this embodiment of our device is substantially identical to that hereinbefore described for the other embodiments of our invention.

It is apparent from the foregoing that we have provided a novel ion-controlled inhaling device which insures that any particles inhaled will be either neutralized or carry a charge of only one sign. The device is particularly useful for smokers suffering from throat irritations and the like and can be incorporated in pipes and cigar holders as well as cigarette holders. The device can be either provided with a self-contained power supply or a power supply which may be carried on the person. The device is also light and compact which facilitates its use.

We claim:

1. In an ion controlled smoking device, a body having a portion thereof adapted to be inserted in the mouth whereby the body may be carried by clamping the jaws of a smoker upon said portion, said body being formed to accommodate the material to be smoked, said body having a passage therein through which smoke can be drawn from the burned material into the mouth of the user, means mounted within the body to cause the production of positive and negative ions within the body, and means within the body creating an electrostatic field extending across said passage, said electrostatic field causing negative ions to follow the electrostatic flux lines across said passage so that the negative ions become intermixed with smoke as it is drawn through the body, the electrostatic field being sufficiently weak so that the negative ions are carried with the smoke into the mouth of the user.

2. A device as in claim 1 wherein said means creating an electrostatic field is mounted within said body to give substantially unimpeded flow to the passage of smoke through said body.

3. In an ion controlled smoking device, a body having a portion thereof adapted to be inserted into the mouth of the user whereby the body may be carried by clamping the jaws of the user on said portion, said body being formed to accommodate the material to be smoked, said body having a passage therein through which smoke can be drawn from the burning material into the mouth of the user, a radioactive source ionizing air within the body to cause the production of positive and negative ions within the body, and means mounted within the body including a pair of positive and negative electrodes mounted on opposite sides of said passage creating an electrostatic field extending through said passage, the ions being generated in the vicinity of the negative electrode to facilitate collection of the positive ions, the negative ions following the electrostatic flux lines towards the positive electrode and passing into the smoke being drawn through said passage, the velocity of the smoke being such that the negative ions are swept with the smoke into the mouth of the user, said negative ions serving to neutralize any positive charged particles in the smoke.

4. A device as in claim 3 wherein said radioactive member serves as the negative electrode.

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