Sept. 29, 1959 H. TRÜB 2,906,686

OZONE GENERATORS FOR LIVING AND WORK ROOMS

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Fig. 1

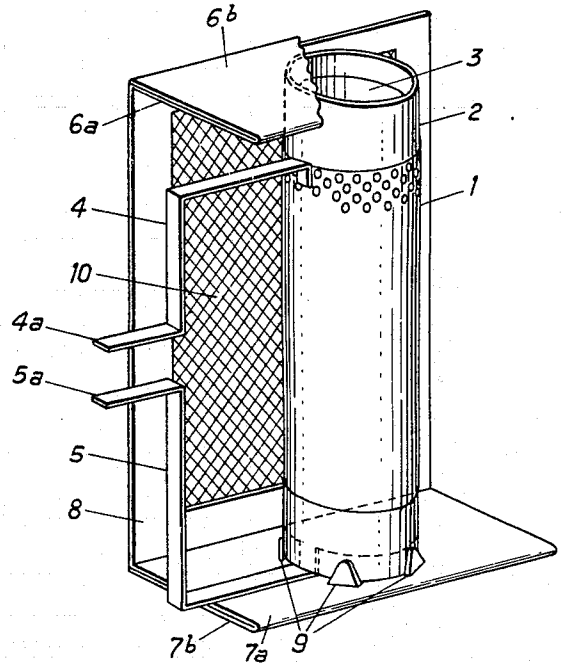
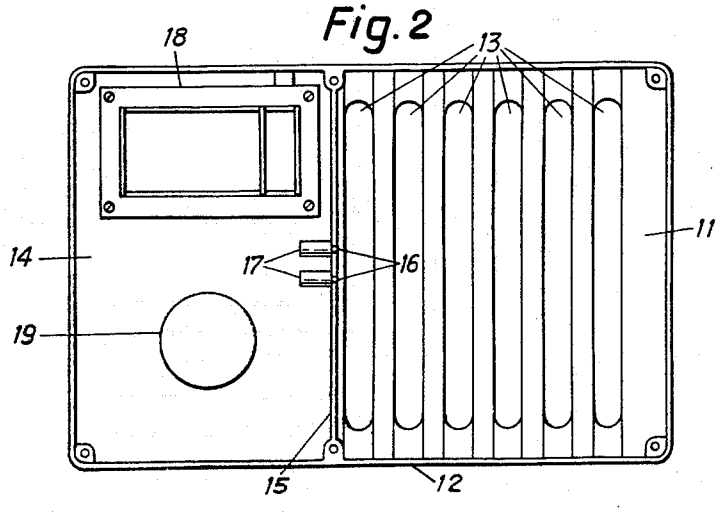


Fig. 2



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Fig. 3

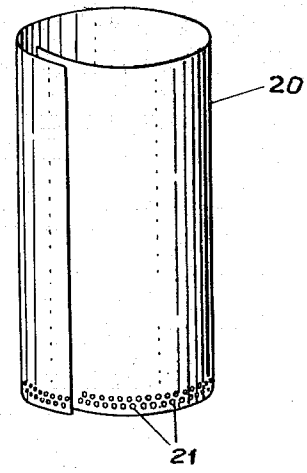


Fig. 4

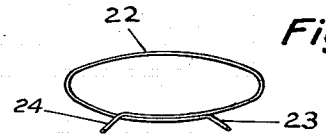
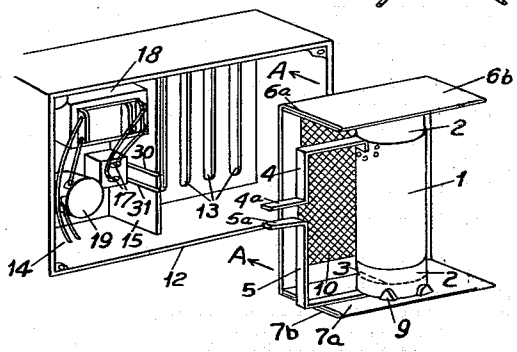


Fig. 5



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OZONE GENERATORS FOR LIVING AND WORK ROOMS

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Claims priority, application Switzerland July 7, 1954

3 Claims. (Cl. 204—317)

The present invention relates to ozone generators designed for use in living and work rooms to improve the air therein.

Ozone generators of relatively low output and operated from the lighting mains are already known. As a rule they consist of a high-tension transformer for connection of the lighting mains and a glow-discharge unit with electrodes. Such low-output ozone generators have generally proved satisfactory but the design of the glow-discharge unit is frequently complicated and costly so that such units are not suitable for mass production and are relatively expensive.

The present invention relates to an ozone generator characterized by the fact that the glow-discharge unit is an interchangeable member suitable for mass production. It comprises a U-shaped holder formed of carboard-type folding insulating material the end walls of which are engaged by the ends of the glass tube which is held against lateral displacement by several tongues projecting from the said walls while the wall parallel to the axis of the glass tube is provided with a window. This unit can be inserted into a suitable compartment formed in the ozone generator housing of insulating material of which the walls lend the necessary stability to the said support.

An embodiment of the present invention is illustrated in the attached drawing, in which

Fig. 1 is a perspective view of the glow-discharge unit according to this invention;

Fig. 2 is a rear view of the ozone generator housing at a reduced scale and with the base plate removed;

Fig. 3 is an embodiment of the outer electrode;

Fig. 4 shows a support for the outer electrode according to Fig. 3; and

Fig. 5 is an exploded perspective view illustrating the manner in which the ozone generator is placed in the housing.

Referring now more particularly to the drawing there is disclosed in Fig. 1 an embodiment of the interchangeable glow-discharge unit suitable for mass production. Glow discharge occurs as known, substantially through a cylindrical electrode 1 which is formed of perforated sheet metal which is slipped over a glass tube 2 to form an outer electrode. A metal lining 3 is applied to the inner wall of the said tube to form the inner electrode. The two electrodes 1 and 3 do not extend to the upper and lower edges of the glass tube 1 and are equipped with leads formed of flat metal strips 4 and 5 respectively.

A preferred embodiment of the outer electrode 1 is shown in Fig. 3. The outer electrode is formed of a metal lining 20 rolled to form a cylinder, by way of example of an aluminum sheet provided with perforations 21. By being rolled around its longitudinal axis, the metal lining 20 is provided with a certain prestress and will adhere to the glass tube 2 of the glow-discharge unit when being slipped over it. The sheet metal may be replaced by a rolled-up metal screen to form the metal lining 20. The tube may be secured by an elastic

holder enclosing the outside of the metal lining. Fig. 4 shows this holder as a ring 22 formed of spring wire of which the ends 23 and 24 are bent out radially. By forcing the ends 23 and 24 towards each other, the spring ring 22 can easily be expanded and slipped over the metal lining 20 enclosing the glass tube 2, and after releasing the ends 23 and 24 the ring will contract the metal and force it against the glass tube 2.

One or more spring rings 22 can be replaced by any other suitable securing device. If desired, one of the ends 23, 24 may be formed as a lead for the voltage supplied to the outer electrode so as to serve as both a resilient support and a contact for the sheet metal. When the material used for the metal lining 20 is sufficiently rigid and elastic, the latter will engage the glass tube so tightly that an additional holder may be dispensed with. Sheet-steel or sheet-wire screen is a suitable material.

A U-shaped holder is provided for the glass tube 2. It is formed with two end or horizontal walls 6*a*, 6*b* and 7*a*, 7*b* as well as a side or upright wall 8. This support is formed, by way of example, of a rectangular piece of cardboard-type foldable insulating material of which the narrow ends are folded over twice thereby forming the horizontal walls 6*a*, 6*b* and 7*a*, 7*b* respectively. No high-grade insulating material is required since the outer electrode 1 does not contact the support while the inner electrode 3 engages it only at the contact strip 5. If desired, all contact can be avoided by bending the contact strip 5 around the lower edge of the glass tube 2 and by providing a recess of sufficient size in the inner lower end wall. Several triangular tongues 9 are pressed out of the inner end walls 6*a* and 7*a* respectively so that the upper and lower edges respectively of the glass tube 2, which engages the end walls 6*a* and 7*b*, respectively, are held against lateral displacement. The wall 8 of the support arranged parallel to the longitudinal axis of the tube is provided with a window 10 covered by a coarse fabric or screen which enables the gases generated by the glow discharge on the outer electrode 1 to emerge but preventing this electrode 1 from being touched from the rear of the support through the window 10.

This support 6*a*, 6*b*—7*a*, 7*b*, 8 possesses not enough rigidity to maintain the shape shown in Fig. 1 without additional support. The entire unit according to Fig. 1 is, however, designed for insertion in a compartment 11 of the housing 12 according to Fig. 2 which has at least two compartments. This housing 12 contains all members of the ozone generator and is formed of a good insulating material, such as a suitable synthetic material. The portion of the front plate of the housing 12 associated with the compartment 11 is provided with openings 13 so that the gases formed at the outer electrode 1 during operation and after insertion of the unit according to Fig. 1 in the compartment 11 can be discharged from the housing 12 through the window 10 and the openings 13. The housing 12 is further provided with a second compartment 14 separated from compartment 11 by a partition 15 so that the gases formed in compartment 11 may not enter compartment 14. The partition 15 is provided with two guiding slots 30, 31 for the passage of the respective bent portions 4*a* and 5*a* of the electrode leads 4 and 5 respectively, which project into the compartment 14 and are removably connected with suitable terminals 17.

Housed in compartment 14 are a high-tension transformer 18 for connection with the lighting mains, a protective resistance (not shown) in the leads to terminals 17, an adjustable primary circuit series resistance 19 for the transformer 18 and a primary circuit fuse (not shown). The series resistance 19 and the transformer

18 are so dimensioned that the secondary voltage is adjustable between a minimum value, which causes practically no glow discharge on the outer electrode 1, and a maximum value, which causes a strong glow discharge on the outer electrode 1.

Referring now to Fig. 5, it is noted that the ozone generator is inserted in the housing 12 which has two compartments separated by partition 15. The partition 15 has slots 30 and 31 for the passage of the contact strips 4*a* and 5*a*. When the ozone generator with its support is inserted in the compartment of the housing whereby the screen 10 aligns with the elongated openings 13 of the upright housing wall, the top and bottom walls of the compartment of the housing 12 will prop the horizontal walls 6*a*, 6*b*, and 7*a*, 7*b* of the U-shaped support.

In compartment 14 there is accommodated the transformer 18 with the contact box having terminal 17 to which the terminals 4*a* and 52 of the contact strips are connected. The transformer 18 is connected to the circuit resistance 19 whereby the transformer is connected to the main via the resistance 19.

Terminals 17 are connected to the secondary of the transformer 18. After the ozone generator with its U-shaped support has been inserted into the compartment in the direction indicated by arrow A, it is merely necessary to connect the terminals 4*a* and 5*a* with the terminal 17 in order to operate the ozone generator.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In an ozone generator equipped with a high-tension transformer for connection to a lighting main and with a glow-discharge unit having two electrodes applied to a glass tube as inner and outer linings, respectively; a housing having walls forming at least two compartments, an outside wall of one of said compartments having an opening therethrough, and a support for said glow-discharge unit made of electrically insulating, foldable material, said support being U-shaped and having two end walls and a connecting wall extending between said end walls, the ends of said glass tube engaging said end walls, said end walls being provided with tongues projecting from said end walls to retain said glass tube against

lateral displacement, said connecting wall being provided with a window, said unit being removably confined within said one of said compartments, the walls of said support being propped against the walls defining said one compartment, with said window in alignment with said openings, said transformer being located in the other of said compartments, and means within said housing connecting said transformer with said glow discharge unit.

2. A system according to claim 1, including compressible clamping means embracing, respectively, said outer and inner metallic linings to maintain the same in position on said glass tube, said clamping means including radially projecting ends for facilitating manipulation of said clamping means.

3. In an ozone generator system having a housing with two adjacent compartments and a partition therebetween; one of said compartments having a perforated upright wall interconnecting a bottom and a top wall, and a U-shaped support of electrically insulating foldable material for an ozone generator and including an upright wall and two horizontal walls extending from the upright wall and folded over to form said horizontal walls, said generator having a glass tube with opposite ends and further having inner and outer metallic linings forming electrodes which are attached to said tube and spaced from said opposite ends thereof, said horizontal walls having spaced flaps engaging the opposite ends of said tube to secure said tube in position on said horizontal walls and spaced from said upright wall of said support, said upright wall of said support being provided with a window positioned adjacent and in alignment with said perforated upright wall of said housing, said horizontal walls of said support being propped between said top and bottom walls of said one compartment.

References Cited in the file of this patent

UNITED STATES PATENTS

1,010,777	Leggett	Dec. 5, 1911
1,403,025	Haase	Jan. 10, 1922
2,288,132	Hartman	June 30, 1942

FOREIGN PATENTS

615	Great Britain	Jan. 9, 1897