

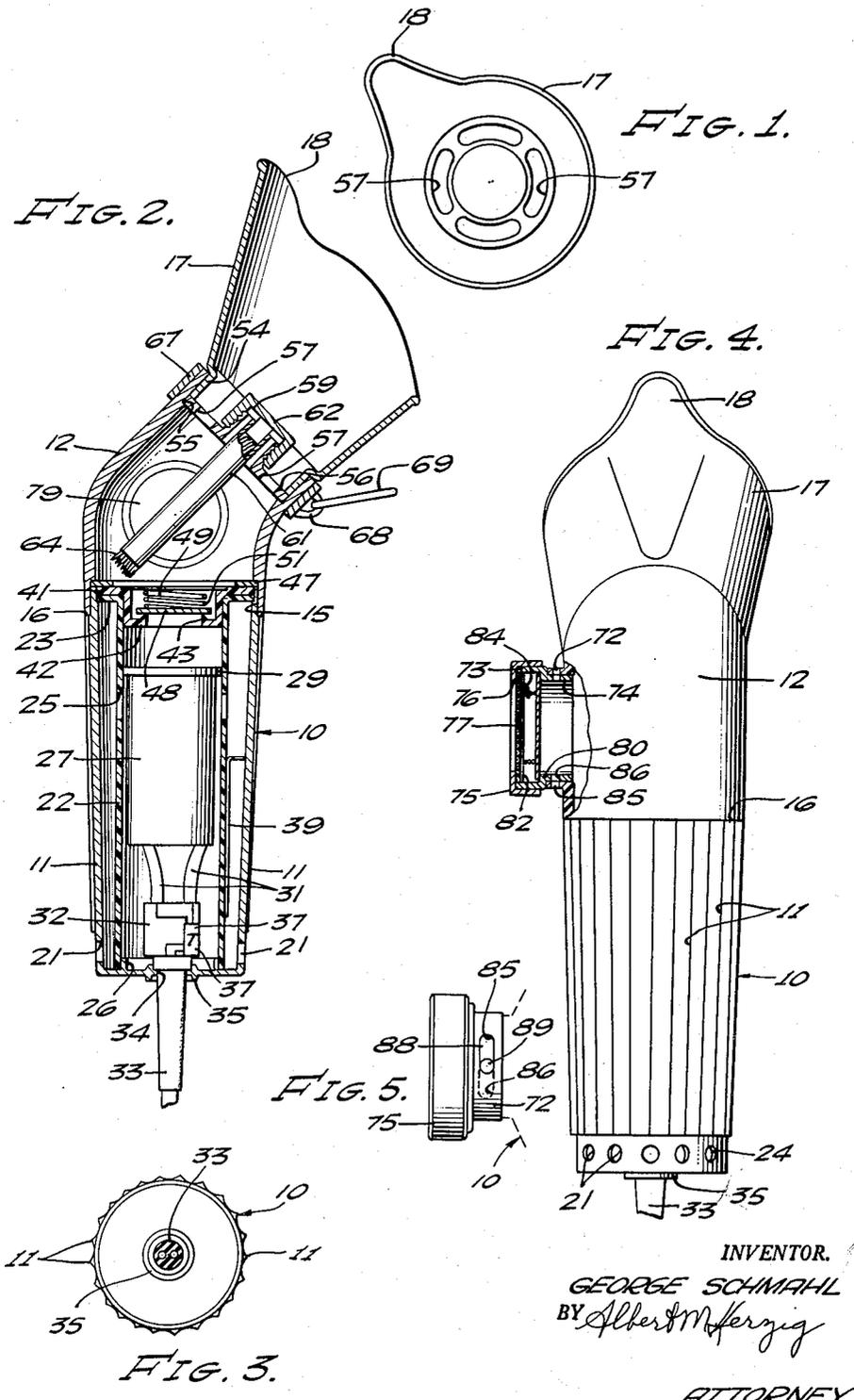
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ELECTRIC INHALER

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ELECTRIC INHALER

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This invention relates to improvements in an inhalator or respirator. This is a therapeutic device providing for treatment by way of inhalation of heated air and/or a medicament to which the inhaled air is exposed.

Inhalators for the purposes stated, broadly are known in the art and generally the purposes for which they are used are known. Usually, such inhalators include a respirator mask which covers the mouth and nostrils or in some instances, only the nostrils. The inhalator includes a heating element so that the user can inhale dry heated air along with vapor of a medicament which is so placed in the inhalator that its vapors are inhaled with the air.

The object of the invention herein is to provide improvements in an inhalator of the type referred to in the foregoing, calculated to improve the effectiveness, utility and adaptability of the inhalator.

A particular object of the invention is to provide an inhalator of the type referred to embodying improved and more effective positioning of, and mounting of a medicament holder in the inhalator.

Another object of the invention is to provide an improvement by way of an adjustable air inlet valve particularly positioned to provide for admission of a volume of air in addition to that which is being heated, to thereby make it possible for the user to better control the temperature of the air that is supplied so that the conditions of usage may be optimized for the individual user.

Another object is to provide an improvement as in the foregoing, wherein the inhalator has a side arm embodying an exhalation valve, having the manually adjustable air inlet valve in the said side arm.

Another object is to provide an improved construction wherein a medicament holder is mounted in the upper part of the inhalator in a central position with respect to the passage leading to and from the face mask, and which is insertable and removable through the face mask.

Further objects and additional advantages will become apparent from the following detailed description, claims and annexed drawings wherein:

FIG. 1 is an end view of the mask of the inhalator;

FIG. 2 is a sectional view taken along a center line of the view of FIG. 4;

FIG. 3 is a bottom view of the inhalator;

FIG. 4 is a front view of the inhalator;

FIG. 5 is a detail view of the manually adjustable air inlet valve.

Referring now more in detail to the drawings, the inhalator in the exemplary form shown, comprises a body 10 which may be made of a material such as plastic. This body has a slight taper from the upper part to the lower part and it is ribbed on the outside, as shown at 11, to make it convenient to hold in the hand. The upper part of the inhalator comprises a cylindrical angled throat member 12. The part 12 has a counterbore 15 and the upper part of the part 10 has an external annular shoulder 16 and the members 10 and 12 are snugly fitted together, and sealed at these parts as shown.

The inhalator includes a face mask part as designated at 17 having a diverging cylindrical construction with an end part 18 shaped to fit over the nose to cover the nostrils. The shape of the mask part 17 at the end is such as to cover the nose and mouth so that the wearer breathes through the inhalator.

The air which is heated and then inhaled, comes in

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near the bottom of the inhalator. The casing or housing 10 has equally spaced openings 21 in its lower part as shown for admitting outside air. Within the body part 10, there is a cylindrical casing or sleeve 22 which may be made of plastic. It has a flange 23 at its upper end which spaces it from the inside of the body part 10. The sleeve 22 fits around an upstanding circular rib 26 at the bottom of the body 10. The sleeve 22 has openings 25 at its upper part to allow the air to pass into the inside of the sleeve 22 to be heated by electrical heating element or cartridge 27 suitably supported within the sleeve 22. As shown, the heating element 27 has a rim at the top as designated at 29 which holds it in position in the sleeve 22 and which has openings to allow the air to proceed upwardly.

The heating element 27 may be of a type which is energized from 110 volts A.C. or the like. The leads from the heating element 27 as designated at 31 extend into a terminal fitting member 32, which may be made of any suitable material including a bushing 33 extending outwardly through an opening 34 in the bottom of body 10, which opening is surrounded by the extending rib 35 which extends both upwardly and downwardly from the bottom of body 10. The fitting or bushing 33 seals within the opening 34. Within the fitting 32, preferably there is provided a thermostat 37 which may be of a known type and which may be set to maintain a temperature of, for example, 120° F. The thermostat operates to turn on and off a heating unit 27 to maintain the temperature.

Spacers 39 in the form of plastic strips may be provided between the sleeve 22 and the inside of the body 10. These strips are spaced angularly from each other.

The flange 23 at the upper end of sleeve 22 seats against a flange 41 on a plastic fitting 42 having a cylindrical part fitting inside the upper end of sleeve 22. The fitting 42 has a central opening through it, and an angular rib at the periphery of the opening providing a valve seat as designated at 43. Numeral 47 designates a thin metal plate having openings in it seated in a groove inside the body 10 and adjacent the flange 41. Numeral 48 designates an inlet check valve which is urged against the valve seat 43 by a coil spring 49, the other end of which bears against the plate 47 which has a group of spring clip members 51 which hold the spring in position.

The mask part 17 has a circular end part 54 which fits snugly into the angular end of the member 12 against an annular shoulder in the end of the member 12 as designated at 55. The mask member 17 has an end plate member 56 having openings 57 in it for the air to pass into the mask. It also has a central threaded boss 59. Numeral 61 designates a tubular medicament holder, the end of which is attached to the inside of a threaded cap 62, which threads onto the boss 59. The tubular medicament holder contains a wick 64 which may be saturated with a medicament so that the air being inhaled is exposed to vapors or fumes from the medicament. The position of the medicament holder is such that no external projection on the inhalator is required and it is accessible from within the mask 17.

The mask may be held in position by means of a ring of suitable material as designated at 67 positioned, for example, around the end part of the member 12 and having a loop 68 to which a ring 69 is attached, and to which, in turn, may be attached the ends of an adjustable strap or band, which may be elastic and which passes behind the wearer's head in a position to hold the inhalator or respirator in place.

Numeral 72 designates a tubular side arm extending from the angular part 12 of the inhalator. Numeral 73 designates a cylindrical fitting having a part 74 fitting within the side arm 72 and having a cap 75 on its extending

part. The cap 75 has an opening 76 which is covered by a screen or piece of mesh material 77. Numeral 79 designates an exhalation check valve in the form of a disk which seats on the internal shoulder 80 within the fitting 73 which forms a valve seat. The check valve 79 is urged towards its seat by a spring 81, the other end of which bears against a thin metal plate 82 inside of the fitting 73 which has a group of extending clips 84 which hold the spring in position.

The side arm 72 has a slot 85 in it, registering with a slot 86 in the fitting 73. Numeral 83 designates an adjustable sliding valve member (not shown in FIG. 4) and operable by a handle or stem 89 extending through the slots whereby the openings or slots may be covered or uncovered to adjust the admission of air through them. This air is in addition to that admitted through the openings 21.

From the foregoing, those skilled will understand the operation and utilization of the invention. It is put in position over the user's nose and mouth and it may be held by a strap or elastic band attached to the ring 69. The cap 62 may be first removed and the wick 64 saturated with a suitable medicament. The cord of the heating element is plugged into a suitable source of power, causing the heating element 27 to heat up. The heat sets up a convective flow of air, with the air coming in through the openings 21 and passing up between the sleeve 22 and the inside of body 10. It moves in through the openings 25 and passes upwardly to the check valve 43. When the wearer inhales, or breathes in, the check valve 43 opens, allowing the heated incoming air to pass upwardly and around the medicament holder 61 and through the openings 57 into the mask 17 of the inhalator. The incoming warmed or heated air, when it passes the medicament holder 61, absorbs vapor from the medicament and the heat tends to cause the medicament to give off its vapors.

As stated above, the thermostat 37 may be set to maintain the air at, for example, 120° F., or it may be adjusted to some other temperature. When the wearer exhales, that is, breathes out, the check valve 43 closes, preventing admission of air to the angled part 12 of the inhalator. The exhalation causes the check valve 79 to open, allowing the exhaled air to be discharged through the opening 76.

As described above, the wearer may adjust the stem or handle 89 to adjust the admission of outside air through the openings 85 and 86. By this adjustment, the user can adjust the amount of outside air that is admitted in addition to that, that is admitted through the openings 21 and heated. In this way, the user can adjust the temperature of the air being inhaled to the most comfortable and effective temperature. By this adjustment, he can also adjust the degree to which the medicament in the holder 61 gives off vapors and therefore, the concentration of vapors in the air being inhaled.

As may be observed, the inhalator may very conveniently be held in one hand if desired, while the strap or flexible

band attached to ring 69 is adjusted to the wearer's head. The valve operated by handle 89 is in a very convenient and easily accessible position to be operated by the user. The position of the medicament holder 61 is such as to provide for a uniform symmetrical flow of air around it so that the concentration of medicament vapors in the incoming air is uniform so that the user is not subjected to overly heavy concentrations of medicament vapor in any inhalation. This, coupled with the fact that the user can very nicely adjust the admission of auxiliary air which is not heated makes it possible to achieve the most effective and optimum conditions for the maximum comfort and relief of the user.

The particular construction and arrangement of parts of the inhalator as described makes possible economic and simplified fabrication and production of the inhalator.

The foregoing disclosure is representative of a preferred form of the invention and is to be interpreted in an illustrative rather than a limiting sense, the invention to be accorded the full scope of the claims appended hereto.

What is claimed is:

1. In an inhalator of the type comprising a housing having a hollow mask part adapted to fit over a wearer's mouth and nostrils, the housing having a part forming a chamber extending from and communicating with the interior of the mask part through a communicating passage, air heating means positioned in the said chamber, there being air flow passage means provided for admitting air to said chamber and over said heating means and for directing heated air to flow between the said chamber and said mask part whereby the wearer may breathe heated air, the said housing having check valve means for discharging exhaled air positioned between said heating means and said mask part; the improvements comprising: a support in said communicating passage; a removable medicament holder mounted on said support and extending along said communicating passage; said support being accessible through said mask part whereby said medicament holder may be removed or replaced through said mask part.

2. A device as in claim 1 wherein said means for discharging exhaled air includes a controllable valve means for controllably admitting additional external air to the interior of the housing to be breathed by the wearer in addition to the heated air.

3. A device as in claim 2 wherein the said mask part includes a throat defining said communicating passage, the said medicament holder being in the form of a tubular member disposed centrally in the said throat of the mask part, said medicament holder being threadedly mounted on said support.

References Cited in the file of this patent

UNITED STATES PATENTS

1,866,667	Parker	July 12, 1932
2,086,140	Silten	July 6, 1937
3,027,896	Newton	Apr. 3, 1962
3,045,670	Hirtz et al.	July 24, 1962