

March 21, 1944.

G. P. MAGGI

2,344,920

FROST MASK

Filed Nov. 19, 1943

3 Sheets-Sheet 1

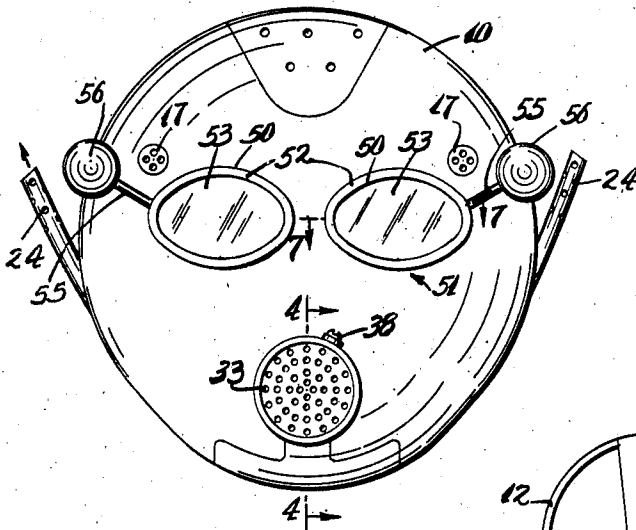


Fig. 1-

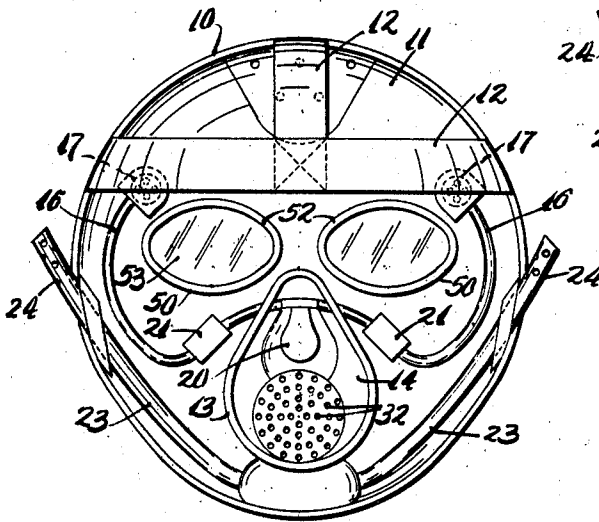


Fig. 3-

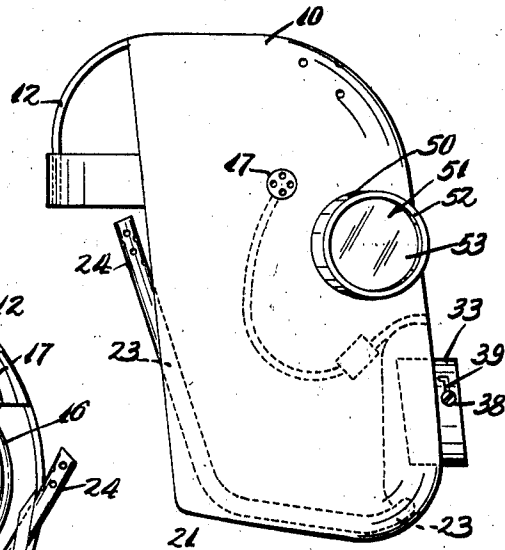


Fig. 2-

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3 Sheets-Sheet 2

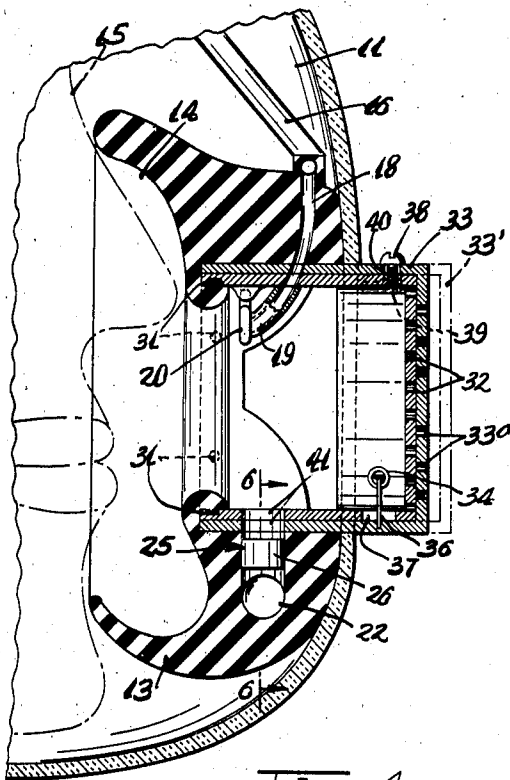


FIG. 4-

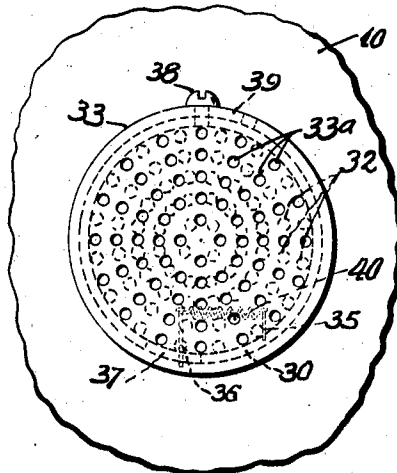


FIG. 5-

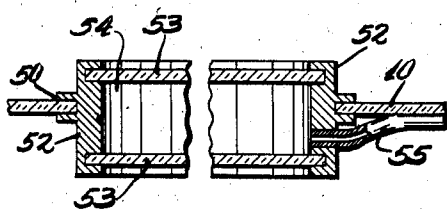


FIG. 7-

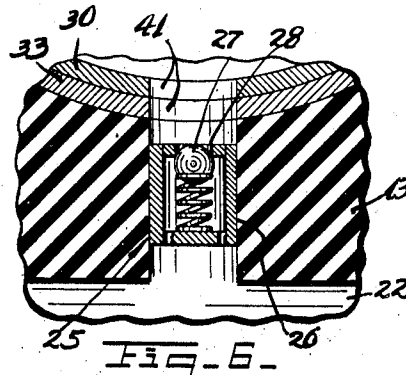


FIG. 6-

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3 Sheets-Sheet 3

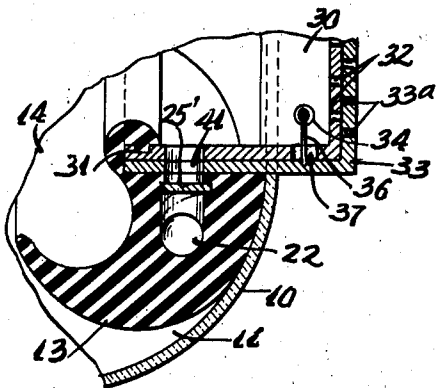


FIG. 8.

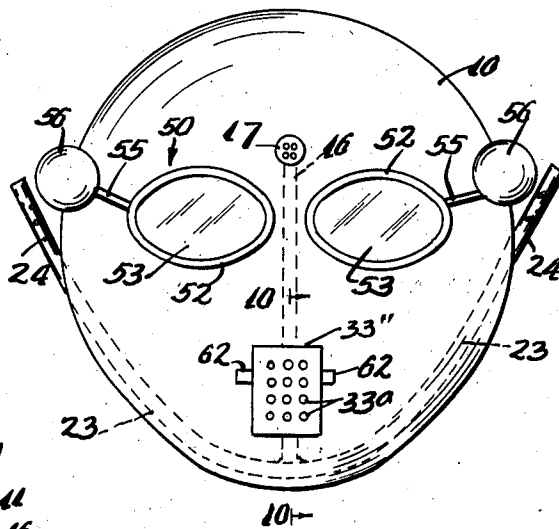


FIG. 9.

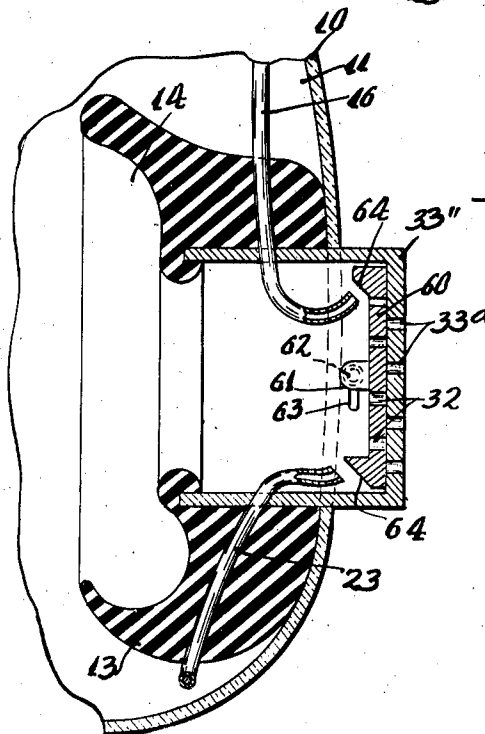


FIG. 10.

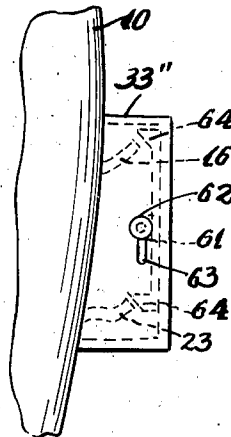


FIG. 11.

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UNITED STATES PATENT OFFICE

2,344,920

FROST MASK

Gilbert P. Maggi, Brooklyn, N. Y.

Application November 19, 1943, Serial No. 510,929

13 Claims. (Cl. 128—141)

This invention relates to new and useful improvements in a frost mask.

More specifically, the invention proposes the construction of a frost mask having a heat insulating and weatherproof body formed of material which will permit a subnormal escape of heat vapors and which forms a primary chamber arranged in a manner to enclose the exposed portions of one's face from the hair line to a point beneath the chin and back to the ears or it may be made to fully enclose the head.

A further object of the invention proposes providing the interior of the heat insulating and weatherproof body with a heat insulating member for engaging over the front of one's nose and mouth in a manner to form a secondary chamber within the primary chamber for enclosing the nose and mouth.

Still another object of the invention proposes air supply tube or tubes from the exterior which pass through the primary chamber in a manner to preheat the air before being supplied to the secondary chamber to supply the secondary chamber with air heated to a degree to be comfortably inhaled.

Still another object of the invention proposes providing the air supply tubes with valves for permitting the entrance of air through these tubes only and the provision of a valve controlled exhaust tube leading from the secondary chamber through the primary chamber to the exterior of the mask to discharge the exhaled air under the clothing of the wearer or into the hood at the back of the head, or to any part of the body where the vapors will not come in contact with the cold air.

A further object of the invention proposes the provision of a tube for speaking which is normally closed and mounted through the body and member and which is arranged to be opened to permit the passage of sound waves, and when opened, closes the air supply tubes and air exhaust tubes to permit air to be taken through the open speaking tubes.

A further object of the invention is the provision of openings in the body arranged concentric with the eyes with the provision of a transparent frost proof means for closing the eye openings to permit the wearer of the mask to see clearly and prevent the transparent means from being clouded by the condensation of vapor thereof.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and

accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure—

Fig. 1 is a front elevational view of a frost mask constructed in accordance with this invention.

Fig. 2 is a side elevational view of Fig. 1.

Fig. 3 is an inside view of Fig. 1.

Fig. 4 is an enlarged detailed partial vertical sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged detailed view of a portion of Fig. 1.

Fig. 6 is a partial vertical sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is an enlarged detailed sectional view taken on the line 7—7 of Fig. 1.

Fig. 8 is a view similar to a portion of Fig. 4, but illustrating a modification of the invention.

Fig. 9 is a front elevational view similar to Fig. 1, but illustrating a still further modification of the invention.

Fig. 10 is an enlarged partial vertical sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a partial side elevational view of Fig. 9.

The frost mask, according to this invention, includes a heat insulating and weatherproof body 10. This heat insulating body 10 is preferably constructed of a material which will permit a subnormal escape of heat vapors from the interior thereof. The heat insulating body 10 is designed to form a primary chamber 11 for enclosing the front of one's face from the hair line to a point below the chin and as far back as the ears or fully around the head. The heat insulating body 10 is provided with suitable straps 12 for engaging about the back of the wearer's head to retain the body 10 in position upon the front thereof.

A heat insulating member 13 is mounted within the body 10 and forms a secondary chamber 14 for enclosing and engaging over the front of the wearer's mouth and nose, as indicated by the dot and dash lines 15 in Fig. 4.

Air supply tube or tubes 16 connect with the exterior of the heat insulating body 10 at points 17 at a distance remote from the heat insulating member 14. The tube or tubes 16 extend through the primary chamber 11 of the body 10 and connect with passages 18 in the top of the heat insulating member 13 and which terminate in a small tube 19. A flat valve 20 is pivotally supported within the member 13 and is arranged to close the end of the tube 19 when air at-

tempts to discharge therethrough and which pivots away from the end thereof to permit air to enter the secondary chamber 14. Intermediate portions of the tube 16 are provided with small containers 17 which are adapted to be filled with feathers, charcoal or any other similar material or substance to absorb moisture, gases and other obstacles which attempt to enter the tubes 16 with the air that is to be inhaled.

The bottom of the member 13 is formed with a discharge passage 22 which connects with discharge exhale air tubes 23 which extend through the primary chamber 11 and which have their free ends 24 extended from the back of the body 10. A one way valve 25 is mounted in the discharge passage 22 to permit air to discharge through this passage while at the same time preventing the entrance of air. The discharge valve 25 comprises a casing 26 enclosing a spring pressed ball 27 which normally closes a discharge opening 28 in the casing 26. When the person wearing the mask exhales the ball 27 will be blown off the discharge opening 28 permitting the exit of air therefrom.

A speaking tube 30 of any shape mounted through the body 10 and a member 13. The speaking tube 30 is anchored in position by means of projections 31 from the member 13 which engage corresponding openings in the tube 30. The tube 30 is provided at its exposed front end with a plurality of openings 32 through which sound waves are adapted to pass. A cup shaped cover 33 engages over the speaking tube 30 and has its walls disposed between the adjacent faces of the tube 30 and the member 13. The front of the cover 33 is provided with a plurality of openings 33' dis-aligned with the openings 32 in the tube 30 to close the front of this tube. A spring 34 acts between a pin 35 mounted on the cover 33 for normally urging the tube and cover into a position in which the openings 32 and 33' are dis-aligned. The pin 36 which is attached to the cover 33 passes through an enlarged slot 37 which permits relative movement between the cover 33 and the tube 30 in a manner to align and disalign the openings 32 and 33'.

A pin 38 extends through an L-shaped slot 39 in the cover 33 and threadedly engages a complementary opening in the speaking tube 30. The screw 38 engaging the slot 39 permits the cover 33 to be rotated relative to the tube 30 to align the openings 32 and 33'. The spring 34 tends to turn the cover 33 relative to the tube 30 to dis-align the tubes 32 and 33'.

In the aligned position of the openings 32 and 33' the cover 33 may be projected slightly outward, as indicated by the dot and dash lines 33' in Fig. 4, to engage the screw 38 into the laterally extending portion of the L-shaped slot 39 to hold the cover 33 and tube 30 in a position in which the openings 32 and 33' are aligned in spite of the action of the spring 34 which tends to disalign these openings.

The speaking tube 30 and cover 33 are formed with aligned openings 41 arranged in alignment with the air intake passage 18 and the air exhaust passage 22. In the normal position of the cover 33, indicated by the full lines in Fig. 4, the passages 41 are aligned with each other, permitting a free intake of air and a free discharge of air. However, when the cover 33 is pulled outwards and twisted to align the openings 32 and 33' the openings 41 will become disaligned and the passage through the air inlet 18 and the air

exhaust passage 22 will be closed. In this position the air to be inhaled and the exhaled air will pass through the aligned openings 32 and 33'.

The body 10 is provided with openings 50 in a position to be aligned with one's eyes when the mask is worn, with each of the openings being provided with a transparent frost proof means 51 closing the eye openings.

The means 51 comprises a plastic or other suitable material frame 52 mounted in the opening 50 and which supports a pair of transparent glasses 53. The glasses 53 are supported in the frame 52 at positions spaced from each other providing a chamber 54 between the adjacent faces of the glass 53. A discharge tube 55 extends from the interior of the chamber 54 along the outside of the body 10 and each is provided with a valve closure 56. The valve closure 56 is arranged in a manner to permit an exhaust pump to be connected therewith for discharging the air from the chamber 54 providing a vacuum space. The vacuum space 54 tends to insulate the inside and outside glasses 53 preventing moisture from condensing thereon and impair vision. This space 54 may contain a suitable gas absorption agent (not shown) such as charcoal, silicate gel, or the like. Glasses to be worn independently of the mask may also be constructed in this manner.

When worn the mask will act to retain all or part of the body heat within the primary chamber 11 to prevent the front of the face from being frost bitten. The application of the intake tubes 16 and discharge tubes 23 will permit air to be supplied to the secondary chamber 14, and the provision of having the intake tubes 16 pass through the primary tubes chamber will act to preheat the air supplied to the secondary chamber 14 at a temperature to be comfortably inhaled. At the same time the speaking tube 30 permits a free conversation to be held when this is necessary, and the arrangement with the speaking tube with its cover 33 to close the intake and exhaust passages when the speaking tube is opened, permits the air to be taken into the secondary chamber through the speaking tube. The application of the vacuum space between the glasses which cover the eye openings of the body 10 tend to insulate these glasses and prevent vapors within the body 10 from condensing upon the glasses and impairing vision, due to the gas absorption agent.

In the modification of the invention shown in Fig. 8 the discharge valve 25' is in the nature of a flap valve which swings to the open position illustrated by the dot and dash lines when air exhausts through the discharge passage 22. The flap valve 25' assumes a normal closed position by the full lines when air is inhaled.

In other respects this form of the invention is similar to that previously shown and like reference numerals identify like parts in each of the several views.

In Figs. 9 to 11 a modification of the invention is disclosed in which the speaking tube 33' is rectangular in shape and formed with the openings 33'. A plate 60 is vertically slidably mounted behind the vertical wall of the speaking tube 33' and carries the openings 32 which are adapted to be aligned with the openings 33'. Lugs 61 extend from the plate 60 along the side walls of the speaking tube 33', and pins 62 extend from the lugs 61 through vertical slots 63 in the side walls of the speaking tube 33' to the outside to

be gripped for moving the plate to align and disalign the openings 33^a and 32.

The air inlet tube 16 and the air discharge tube 23 have their inner ends disposed adjacent the plate 60, and the plate 60 is formed with valve closure members 64 engageable with the ends of the tubes 16 and 23 for closing them. As shown on the drawings, when the openings 32 and 33^a are disaligned, the closure members 64 are disengaged from the ends of the tubes 16 and 23 leaving them free to pass air. However, when the plate is moved to align the openings 32 and 33^a, the closure members 64 will engage the ends of the tubes 16 and 23 closing them, so that air will be supplied through the aligned openings 32 and 33^a.

In other respects this form of the invention is similar to that previously shown and like reference numerals identify like parts in each of the several views.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open.

2. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said heat insulating body being formed of material which will permit a sub-normal escape of heat vapors from the interior thereof.

3. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting

with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, and a valve on said air supply tube for permitting the entrance of air to the secondary chamber while preventing the discharge of air through this tube.

4. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tube from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, and a valve mounted in said exhaust tube for permitting the exhaust of air only.

5. A front mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said tube and cover being provided with openings adapted to be aligned in a turned position of said cover relative to said tube.

6. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said tube and cover being provided with openings adapted to be aligned in a turned position of said cover relative to said tube, and resilient means for urging said cover into a position relative to said tube in which said openings will be disaligned.

7. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face, a heat insulating member for engaging over

and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said tube and cover being provided with openings adapted to be aligned in a turned position of said cover relative to said tube, and resilient means for urging said cover into a position relative to said tube in which said openings will be disaligned, and means for holding said cover in a turned position relative to said tube against the action of said resilient means in which said openings will be aligned.

8. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, and containers of feathers, charcoal or other similar materials, or substances mounted in said air supply tubes for absorbing moisture and gases from the air being supplied by said tubes to said secondary chamber.

9. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said body having openings for the eyes, and transparent frost proof means closing said eye openings.

10. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tube from said secondary chamber passing through

said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, and a valve mounted in said exhaust tube for permitting the exhaust of air only, said valve comprising a casing enclosing a spring pressed ball.

11. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tube from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, and a valve mounted in said exhaust tube for permitting the exhaust of air only, said valve comprising a flap valve.

12. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said cover, comprising a slidably mounted plate having openings alignable with openings in said tube.

13. A frost mask, comprising a heat insulating body for engaging over and to the front of one's face forming a primary chamber about one's face, a heat insulating member for engaging over and to the front of one's nose and mouth and mounted within said body forming a secondary chamber within said primary chamber, air supply tubes from the exterior passing through said primary chamber for preheating and connecting with said secondary chamber, air exhaust tubes from said secondary chamber passing through said primary chamber and then to the exterior, a tube for speaking mounted through said member and body, and a cover for shutting said speaker tube and controlling said air tubes for closing said air tubes when the speaker tube is open, said cover, comprising a slidably mounted plate having openings alignable with openings in said tube, said inlet and discharge tubes having their ends disposed adjacent said plate, and valve members on said plate for closing the ends of said tubes in the aligned position of said openings and for opening the ends of said tubes in the disaligned position of said openings.

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