

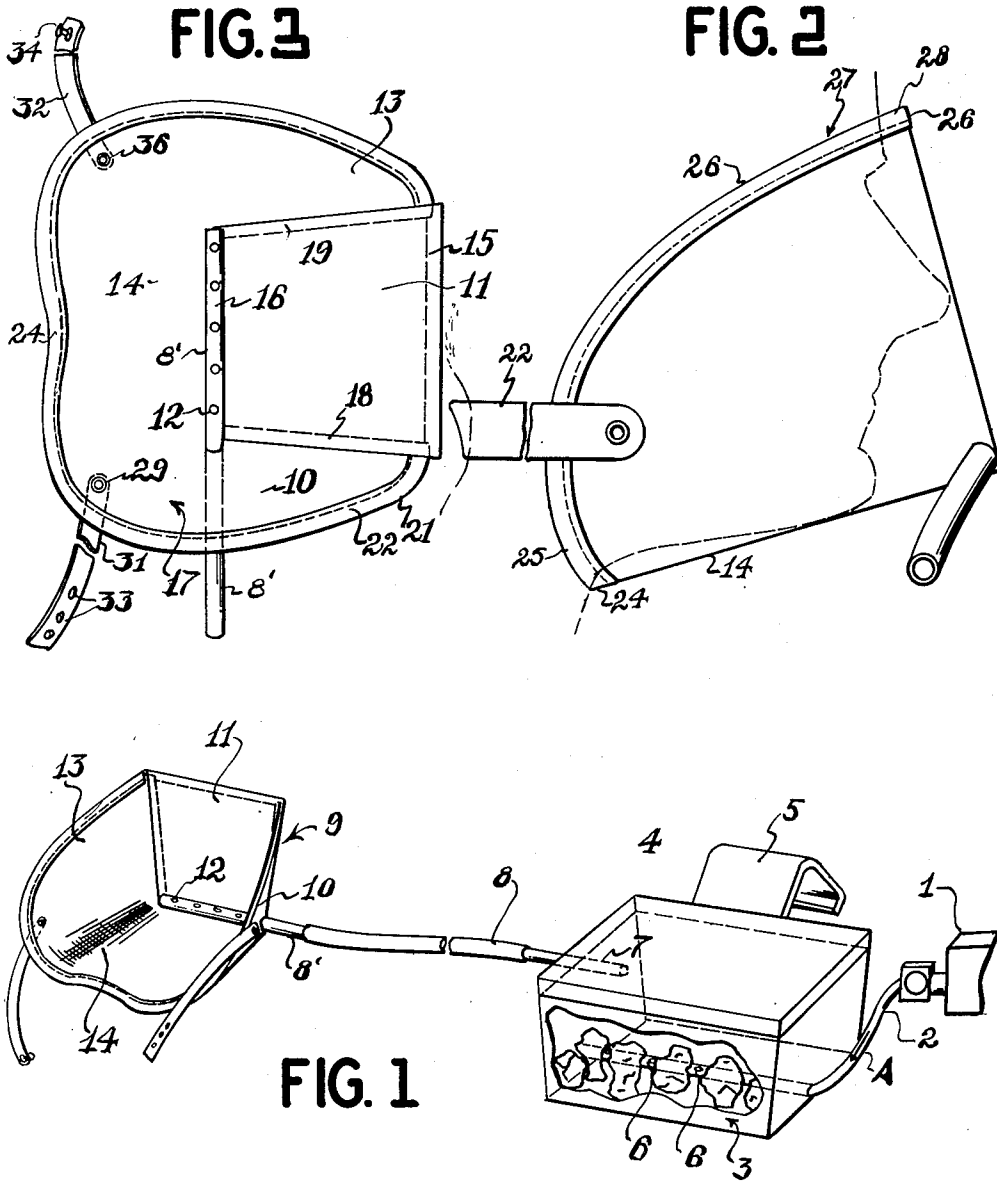
Nov. 11, 1952

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2,617,415

FACE MASK

Filed March 30, 1951



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# UNITED STATES PATENT OFFICE

2,617,415

## FACE MASK

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Application March 30, 1951, Serial No. 218,462

4 Claims. (Cl. 128-205)

1

The present invention relates to a face mask and more particularly an oxygen mask used therapeutically for a great number of illnesses in order to make it easier for a patient to obtain the necessary oxygen in breathing. The common practice at the present time is to use a so-called oxygen tent which as the name implies is a tent which is placed over the bed of the patient with the top above his head and the sides extending down over portions of the bed. This tent is expensive, clumsy to handle, uses a great deal of oxygen and considerably restricts the patient.

The applicant has overcome these difficulties in the development of a simple face mask which will provide all of the necessary needs for the supply of oxygen to the individual without having the disadvantages enumerated above. The face mask of the present invention may further be readily and quickly put on the patient and will permit the patient to go on with such usual activities as reading, talking, or whatever he might be permitted to do under the circumstances.

The invention will be more fully described in the specifications set forth below when taken in connection with the drawings illustrating an embodiment thereof, in which:

Figure 1 shows schematically the system of the present invention.

Figure 2 shows the face mask for supplying oxygen as applied to the face of an individual, and

Figure 3 shows a view of the face mask as viewed from the left side of Figure 2.

In the system indicated in Figure 1, the oxygen may be supplied from a container 1 which is commonly equipped with pressure reducing valves so that the gas flowing through the flexible pipe 2 will be at the desired pressure. The gas flowing through the pipe 2 is conveyed through a cooler and humidifier 3 which is in the form preferably of a plastic box with a removable cover 4 on the top of it. The box is equipped with a handle or support 5 by means of which it may be hung over the side or back of the bed. The pipe 2 should be sufficiently long so as to permit the box to be placed in a desired position somewhere near the patient. The pipe 2 which may be made of rubber or plastic and which preferably is flexible, enters into the bottom of the box 3 wherein it is provided with a number of ports or holes 6 through which the oxygen will bubble to an outlet 7 at the top of the box. The box will be filled with ice cubes or cracked ice with some cold water so that the oxygen bubbling through the cooled box will become cooled and humidified.

2

In order that the water will not back up into the oxygen pipe 2 to any degree, this may be raised to a higher level than the box 3 or else an upwardly extending loop may be formed in the pipe 2 to bring the top of it above the top level of the box. Usually these precautions need not be taken, however, since the flow of oxygen is always in the direction as indicated by the arrow A and the water in the container will not interfere with the flow of the gas. The outlet 7 is preferably in the box proper and not in the cap, although it may be in the cap if desired. The outlet 7 may be part of the tube 8 which extends to the face mask 9. The tube 8 which is also flexible and may be made of plastic material like a vinyl plastic, polyethylene, or some synthetic rubber, should be flexible so as to permit the mask to be turned and moved either by the patient or by the nurse without interfering with the connection of the tube 8 with the container 3. The tube 8 is connected to an outlet tube 8' of the mask 9 by sliding one tube over the other or in any other suitable way. The tube 8' may be also made of material similar to that of the tube 8 and this tube 8' extends through the side face 10 of the mask 9 at the corner where the front face 11 and the bottom face 14 are jointed. Within the face mask, the tube 8' extends along the corner of the two faces just mentioned, across the face mask and is provided with openings or ports 12 by means of which the oxygen seeps upward through the mask.

The mask is shown more fully in Figures 2 and 3. This is preferably made of one or two main flat sheet members. In Figures 2 and 3, the elements comprising the two sides 13 and 13 and the bottom 14 may be of one piece of material while the face element 11 may be made of the same material but of a piece which is cut out in the shape of a rhomboid with a top and bottom edges 15 and 16 respectively parallel to each other and the side edges slightly sloping downward toward each other. The single flat section which is designated as a whole as 17 is then formed in a three sided element with peripheral marginal flaps 18 and 19 bent inward at approximately right angles over the outer face edge of the piece 11 and cemented by suitable cement in place. Both of the elements 11 and 17 may be of transparent plastic such as cellulose acetate, methyl methacrylate, or any other common plastic material suitable for the present purpose. The gauge of the material may be in the neighborhood of 20 thousandths or more. The top edge 15 of the face 11 is faced over as indicated at 20 (Figure 2), so

that this edge will be smooth and the exposed edges of the sides and bottom are also provided with a binding tape 21 which is stitched to the sides and bottom as indicated at 22 but may if desired be glued or cemented to the same.

As indicated more particularly in Figure 2, the face mask is provided with a definite relation to the human face when attached to it. The mask for this reason is made in a number of sizes and is also provided with an adjustable attaching strap 23 which will be more fully described presently.

Referring first, however, to the relationship of the face mask and the individual, it is to be noted that the mask does not hermetically seal the face and actually provides a considerable opening between it and the face in certain regions. Along the edge 24 of the bottom face, the mask is brought up against the neck of the individual at a point near the curve of the neck and the head, and for a short distance along the side approximately to the point where the attaching tape is, the side section 25 fits fairly closely to the neck. From a position above this, however, along the convex curve section 26 the binding edge gradually works away from its closeness to the face until at the top near the junction with the front section at a point approximately at 27 there is considerable space between the curve of the forehead and the mask and this continues all the way around the front of the forehead as indicated in the section labeled 28. The face mask is, therefore, shaped to conform to the average human face in such a fashion, namely, that when it is properly attached in place on the individual at the top front of the mask it is spaced from the forehead with the spacing gradually diminishing around the side of the head and approximately just above the attaching band when the side binding edge of the mask begins to come in contact with the side of the face. The rest of the edge of the mask is rather closely in contact with the human face all the way around the lower portion of the side and the bottom. For this purpose as indicated in Figures 2 and 3, the mask is provided with a slightly concave edge along its bottom as indicated at 24. The mask is attached preferably by a single attaching strap which may be and preferably is made in two parts clamped in swiveled joints or rivets 29 and 30 to the sides 10 and 13 of the mask approximately in its widest section just below the portion normally occupied by the ear of an individual. The strap sections 31 and 32 are preferably drawn approximately straight backwards around the junction of the neck and the head so as to pull the edge 24 of the bottom against the neck of the individual. The section straps 31 and 32 are provided with adjusting clamping facilities which as indicated in Figure 3 comprise a series of holes 33 in the strap 31 and a single button 34 in the strap 32 which may be fastened at any of the holes.

The mask has been carefully designed to accomplish certain results which have been found necessary. The oxygen or gas fed to the patient seeps into and permeates the space in the lower section of the mask. This gas, it will be remembered, is cooled so that it is heavier than the normal air in the room and therefore has a tendency to remain down in the space bordered on the one side by the individual's face, on the top partly by his nose, and otherwise by the lower sections of the bottom of the mask and the front of the mask in the region of the corner

where the gas or oxygen is fed to the patient. The patient will breathe this cold air in through his mouth and nose and exhale the warm air in the same way which will quickly rise up around the front section of the mask and escape around the top of the mask. It will, therefore, readily be seen that in this fashion a continuous supply of the necessary oxygen is provided for the patient and that circulation or discharge of the used gases are automatically accomplished through the fact that the warm gases will rise to the top and escape after they have been used.

It has been found that the small face mask above described will provide as much oxygen to the patient in a better fashion than the large oxygen tents. The supply is uniform, less oxygen is needed, and the patient is comparatively free in his action.

Having now described our invention, we claim:

1. A face mask of thin, transparent, flexible, plastic material, capable of retaining its form, comprising side walls, a bottom wall joined with the side walls providing a continuous margin formed to fit the side of the face and under the chin around the front of the neck of the individual, a substantially flat front wall joined along its bottom edge to the bottom wall and at its side edges to the side walls forming a continuous surface with all said walls, with the side edges of the front wall tapering towards one another in the direction of the bottom edge of the front wall, the upper edge of said front wall normally standing forward of the position occupied by the forehead of the individual to which the mask may be applied, gas inlet means positioned in the vicinity of the junction of the front wall and bottom wall, and a holding strap extending from one side wall to the opposite side wall around the back of the head.

2. A face mask of thin transparent, flexible, plastic material, capable of retaining its form, comprising side walls, a flat bottom wall joined with the side walls providing a continuous margin formed to fit the side of the face and under the chin around the front of the neck of an individual, a substantially flat rectangular front wall joined along its bottom edge to the bottom wall and at its side edges to the side walls forming a continuous surface with all said walls with the side edges of the front wall tapering towards one another in the direction of the bottom edge of the front wall, the upper edge of said front wall normally standing forward of the position occupied by the forehead of the individual to which the mask may be applied, gas inlet means positioned in the vicinity of the junction of the front wall and bottom wall, and a holding strap extending from one side wall to the opposite side wall around the back of the head.

3. A face mask of thin transparent, flexible, plastic material, capable of retaining its form, comprising side walls, a bottom wall joined with the side walls providing a continuous margin formed to fit the side of the face and under the chin around the front of the neck of an individual, a substantially flat front wall joined along its bottom edge to the bottom wall and at its side edges to the side walls forming a continuous surface with all said walls with the side edges of the front wall tapering towards one another in the direction of the bottom edge of the front wall, the upper edge of said front wall normally standing forward of the position occupied by the forehead of the individual to which the mask may be applied, gas inlet means positioned in the

5

vicinity of the junction of the front wall and bottom wall, the margin of the side edges and bottom having a binding tape finish and the top edge of the front wall having its marginal edge faced backwards on itself, and a holding strap extending from one side wall to the opposite side wall around the back of the head.

4, A face mask of thin, transparent, flexible, plastic material, capable of retaining its form, comprising side walls, a bottom wall joined with the side walls providing a continuous margin formed to fit the side of the face and under the chin around the front of the neck of an individual, a substantially flat front wall joined along its bottom edge to the bottom wall and at its side edges to the side walls forming a continuous surface with all said walls with the side edges of the front wall tapering towards one another in the direction of the bottom edge of the front wall, the upper edge of said front wall normally standing forward of the position occupied by the forehead of the individual to which the mask may be applied, gas inlet means positioned in the vicinity of the junction of the front wall and bot-

6

tom wall, and a holding strap having two separate sections, the end of one section having a snap fastener applied along the periphery of one side wall for attaching one section of the strap and the end of the other section having a snap fastener applied along the periphery of the other side wall for attaching the other section of the strap, and means on said sections for adjusting the length of the strap to fit the head of the individual to whom it is to be applied.

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