

J. J. VIERS

OXYGEN TENT APPARATUS

2 Sheets-Sheet 1

FIG. 1

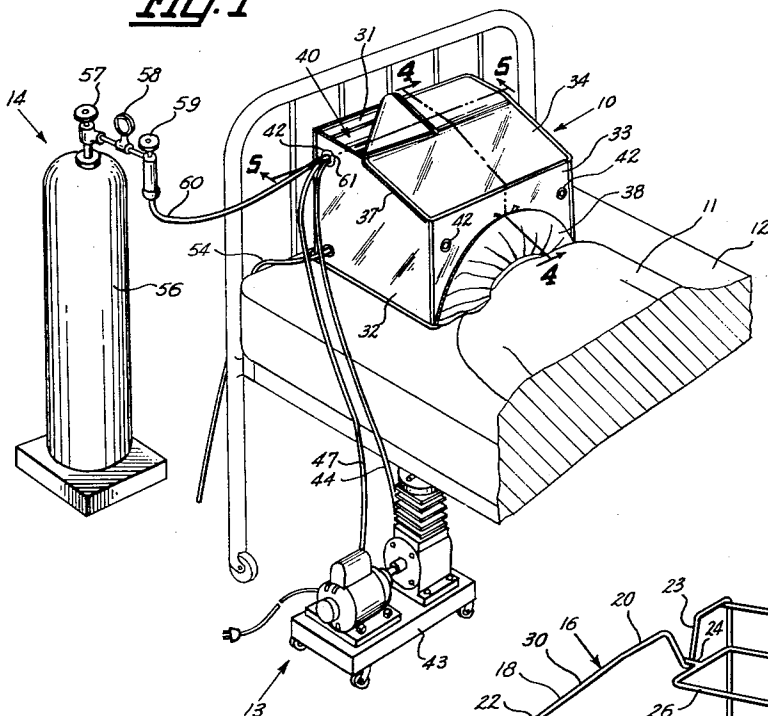


FIG. 2

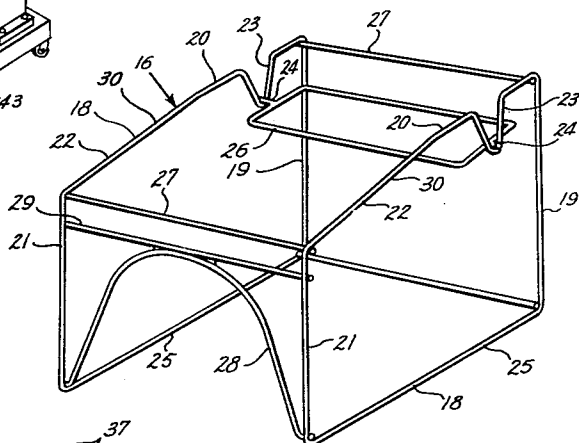
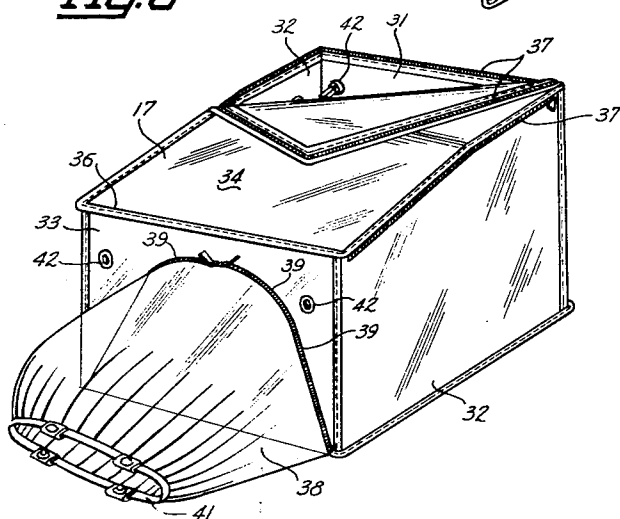


FIG. 3



BY
Lowell & Henderson
ATTORNEYS.

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J. J. VIERS

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OXYGEN TENT APPARATUS

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2 Sheets-Sheet 2

FIG. 4

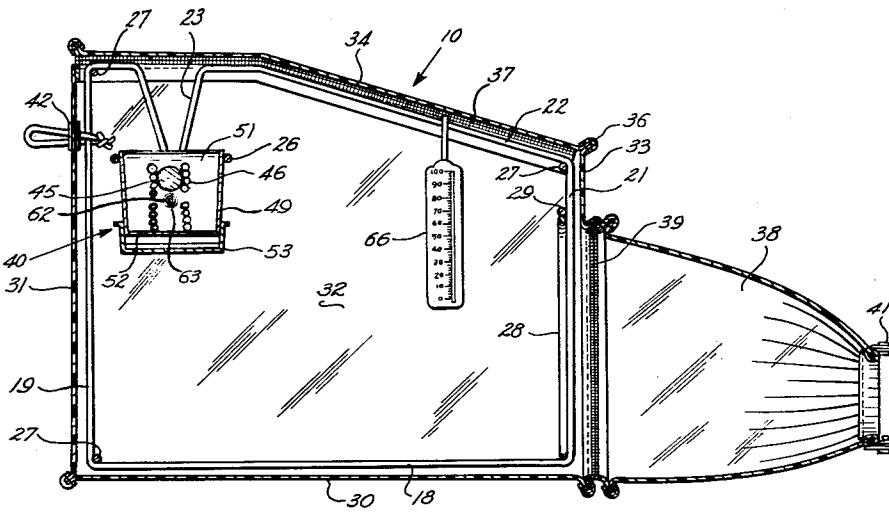
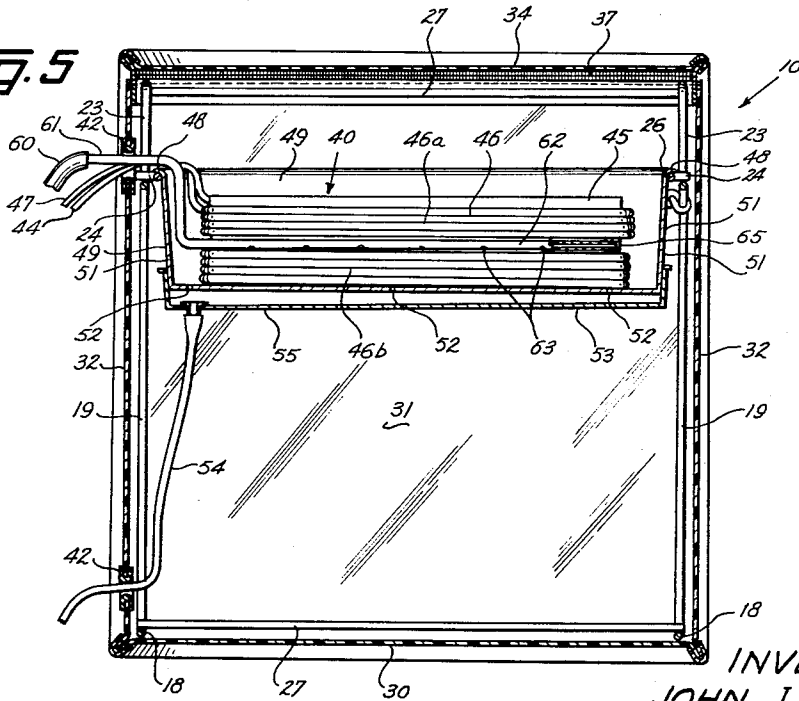


FIG. 5



INVENTOR.
JOHN J. VIERS

BY *Lowell & Henderson*
ATTORNEYS.

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3,000,379

OXYGEN TENT APPARATUS

John J. Viers, 110 W. Grant, Marshalltown, Iowa

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This invention relates generally to oxygen tents used in administering respiratory treatment to patients and in particular to an apparatus for maintaining stable the temperature, humidity and oxygen concentration in a tent which receives only the head or the head and shoulders of a patient to be treated.

An object of this invention is to provide an improved oxygen tent.

A further object of this invention is to provide an oxygen tent having apparatus for initially cooling the oxygen and then directing the cooled oxygen within the tent to circulate and intermix with the air in the tent whereby to maintain stable the temperature and humidity conditions of the mixture within the tent.

A further object of this invention is to provide apparatus for an oxygen tent capable of maintaining stable desired conditions of temperature and oxygen concentration within the tent over a range to meet the requirements of a patient.

Still another object of this invention is to provide an apparatus for an oxygen tent adapted to maintain a desired temperature of the oxygen and air within the tent and to continuously and slowly circulate this mixture quietly and efficiently throughout the tent without discomfort to the patient.

Yet another object of this invention is to provide an oxygen tent and an oxygen supplying and cooling apparatus therefor which is of a compact construction capable of being readily moved from patient to patient, and permitting free access to and about the patient when in use.

Further objects, features and advantages of this invention will become readily apparent upon reference to the following description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a fragmentary perspective view of one embodiment of the oxygen tent apparatus of this invention;

FIG. 2 is an enlarged detail perspective view of a frame for the apparatus;

FIG. 3 is an enlarged perspective view of the enclosure for the apparatus.

FIG. 4 is an enlarged sectional view taken along the line 4-4 in FIG. 1; and

FIG. 5 is an enlarged sectional view taken along the line 5-5 in FIG. 1.

Referring now to the drawings and particularly to FIG. 1, the oxygen tent apparatus of the invention is comprised generally of a tent unit 10 for enclosing the head (not shown) or the head and shoulders of a patient 11 lying on a hospital or other bed 12, a refrigeration unit 13 for controlling the humidity and the temperature of the air in the tent unit 10, and an oxygen unit 14 for supplying oxygen to the tent unit 10.

The tent unit 10 includes an open frame 16 (FIG. 2) of a general box shape, formed of welded mild steel rod or the like, and having a covering or enclosure 17 (FIG. 3) of a clear plastic material. The frame 16 has a pair of substantially rectangular sides 18, the rear legs 19 of which are longer than the front legs 21, and with the legs being connected together by a stop member 22 and a bottom member 25. The top members 22, from the legs 19, have a first section 20 parallel with a corresponding bottom member 25, and inclined sections 30 connected with the front legs 21. V-shaped notches 23 are formed in the sections 20 for pivotally supporting the end extensions or stub shafts 24 of a rectangular shaped cradle 26 extended transversely of the frame 16. Transverse

2

brace rods 27 are secured to the frame sides 18, and a curved rod 28 is secured at its ends to the sides 18 at the front of the frame 16. The curved rod 28 is reinforced by a brace 29 secured between the front legs 21.

The plastic enclosure 17 (FIG. 3) has a bottom wall 30, a rear wall 31, a pair of side walls 32, and a front wall 33 and is adapted to snugly fit about the frame 16 (FIGS. 1, 4 and 5). A top flap or wall 34 is provided and is secured at the front end 36 (FIG. 3) thereof to the top edge of the front wall 33, the remaining three sides of the top wall 34 being connected to the top edges, side and rear walls of the enclosure 17 as by a zipper 37. The front wall 33 is cut out, as best indicated in FIG. 3, along the outline of the curved rod 28 (FIG. 2) to provide for the attachment thereto of a plastic sleeve 38, as by a pair of zippers 39. An elastic band 41 is stitched at the front end of the sleeve 38. A plurality of holes reinforced by grommets 42 (FIGS. 1 and 3) are provided at various spaced locations in the walls of the enclosure 17 for purposes described in detail hereinafter.

Referring again to FIG. 1, the refrigeration unit 13 is mounted on a portable dolly 43 and is of a conventional motor driven, compressor-condenser type using Freon 12 gas. The liquid refrigerant is supplied through a conduit 44 to a cooling unit 40 comprising evaporating coils 46 (FIGS. 4 and 5) located within the tent unit 10, and with the resulting gas being returned to the unit 13 through another conduit 47.

Within the tent 10 (FIGS. 4 and 5), the evaporating coils 46 are arranged in a vertically stacked group elongated in formation, and wherein an upper group 46a (FIG. 5) of coils is vertically spaced above a connected lower group 46b. A conventional expansion valve 45 included in the refrigeration unit 13 is placed within and at the top of the coils 46. The coils are supported on a condensate pan 49, having upright supports 51 at its ends terminating in downturned lips 48 which are engageable with ends of the cradle 26. A plurality of small holes 52 are formed in the pan 49 for draining condensate into a drip pan 53 secured to and located below the condensate pan 49. A drain pipe 54, extended through a grommet opening 42, provides for the removal of the condensate to a location outside of the tent 10.

The oxygen unit 14 (FIG. 1) comprises a tank 56 provided with a shut-off valve 57, a pressure regulating supply valve 58, and a second regulating valve 59 for controlling the supply of oxygen through a flexible conduit 60. The conduit 60 is connected to a tube 61 which passes through a grommet opening 42 (FIG. 5) into the tent 10. As best appears in FIG. 5, the tube 61 has an oxygen discharge section 62 inserted longitudinally of the coils 46 between the upper and lower coil groups 46a and 46b, respectively. The discharge section 62 has its end 65 capped, or otherwise closed, and is formed with a plurality of longitudinally spaced outlet holes 63 facing the condensate pan 49.

In use, the apparatus is easily transported about a hospital, for example. Upon disconnecting the oxygen conduit 60 from the tube 61, the rollable refrigeration unit 13 can be pulled by one hand and the tent unit 10 can be carried by the other hand. The tent unit 10 can of course also be placed on a rollable stand. After the sleeve 38 has been inserted over the head of a patient, with the elastic band about his neck, the tent unit 10 with the cooling unit 40 in place can be slipped over the patient's head. The sleeve 38 is then zipped to the enclosure front wall 33. The removable top wall 34 provides an easy entrance to the interior of the tent unit 10 for administering to the patient, etc.

Upon coupling the oxygen conduit 60 and the tube 61, operation of the refrigeration unit 13 and the oxygen

unit 14 by one skilled in this art enables a stable temperature, humidity and concentration of oxygen within the tent unit 10 to be maintained over a range to meet the patient's requirements. As the discharge end 62 of the oxygen tube is in a thermal exchange relation with the refrigerant cooling coils 46, the oxygen is first cooled within the tube end 62, then as it is discharged through the opening 63, it is deflected from the condensate pan 49 past the coils 46 where it is further cooled. The deflected oxygen then passes into the enclosure 17 for slowly circulating the cooled air. A thermometer 66 (FIG. 4) is placed within the tent unit 10 for indicating the temperature therein. The temperature of the refrigerant fluid is controlled by a thermostat (not shown) in the refrigeration unit 13.

It should be noted that the V-shaped notches 23 are of an acute angle (FIG. 4) sufficient to enable the tent unit 10 to be used with the head of the bed 12 up, wherein the patient 11 is propped up. By this arrangement, the cradle 26 will pivot within the notches 23 so as to remain in an upright position. In addition to the angularity of the notches 23 retaining the cradle 26 in place, the conduits 44 and 47 and the tube 61 prevent the cradle from slipping toward the rear of the tent frame, should the tent unit 10 be leaned too far forward during the positioning.

Although a preferred embodiment of the invention has been described herein, it is to be remembered that various modifications may be made thereto without departing from the full scope of the invention as defined in the appended claims.

I claim:

1. In a tent for receiving at least the head portion of the body of a patient in medical treatment including a top wall and a pair of oppositely disposed end walls, one of said end walls having a closable head receiving opening, a cooling unit comprising a plurality of connected vertically stacked coils, means supporting said cooling unit within said tent at a location adjacent to and extended transversely of said other end wall, with a pair of adjacent ones of said coils being vertically spaced over a portion of their lengths, an oxygen supply tube having a discharge end section extended transversely of said other end wall and inserted within said cooling unit between said vertically spaced pair of coils, and a closure for the terminal end of said discharge

section, said section within said cooling unit being formed with a plurality of longitudinally spaced outlets, whereby the oxygen supplied within the tent is cooled and circulated with the air in said tent.

2. In a tent for receiving at least the head portion of the body of a patient in medical treatment including a frame unit having a pair of opposite side walls and a pair of opposite end walls, with one of said end walls having a head receiving opening, a cradle unit within said tent adjacent the upper side of the other one of said end walls, means supporting said cradle unit on said side walls for rockable movement about an axis extended between said side walls, a drip pan supported from said cradle unit, a cooling unit supported on said pan, and a tube for supplying oxygen to said tent having a discharge end section within said tent extended transversely of the end walls in a thermal exchange relation with said cooling unit, said discharge section being closed at its terminal end and formed with a plurality of longitudinally spaced openings in a side thereof facing said drip pan, whereby the oxygen from said outlets flows from said cooling unit to circulate with the air in said tent.

3. In a tent for receiving at least the head portion of the body of a patient in medical treatment including a frame unit having a top wall and a pair of end walls one of which has a closable head receiving opening, a cooling unit mounted on said frame unit within said tent and comprised of one or more coils adapted to receive a cooling fluid from a source external said tent, and a tubular member within said tent and having a pair of opposed ends, one end open and adapted to be connected to a conduit leading from a source of oxygen external said tent, the opposite end of said tubular member being closed, said tubular member extended adjacent said cooling unit and having a plurality of oxygen outlets formed therein between said opposed ends, said outlets facing toward said cooling unit, whereby the oxygen supplied within the tent is directed against said cooling unit to be cooled and circulated with the air in said tent.

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