

[54] ANALGESIC APPARATUS

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[51] Int. Cl. A61m 15/00

[58] Field of Search 128/206, 208, 201, 195, 128/198, 188, 142.3, 146.7

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[57] ABSTRACT

A hose-linkage device is specifically intended for use in connecting and delivering analgesic gas from a suitable gas supply source to a nasal inhalator which is used in dental work or surgery. The device includes a pair of flexible extension hoses leading away from the gas inlet means on the inhalator and a flexible gas supply hose connected to each of the extension hoses by means of an elbow joint in such a manner that when the patient is in a prone position, the extension hoses will extend away from the inhalator in opposite directions to a point alongside the patient's head and the gas supply hoses will extend substantially horizontally along the sides and over the top of the patient's head where they are joined together by a hose clip and thereafter will continue for connection into the gas supply source. An adjustable connecting strap has opposite ends connected to the elbow joints and passes behind the patient's head in order to retain the inhalator in proper position over the patient's nose.

9 Claims, 3 Drawing Figures

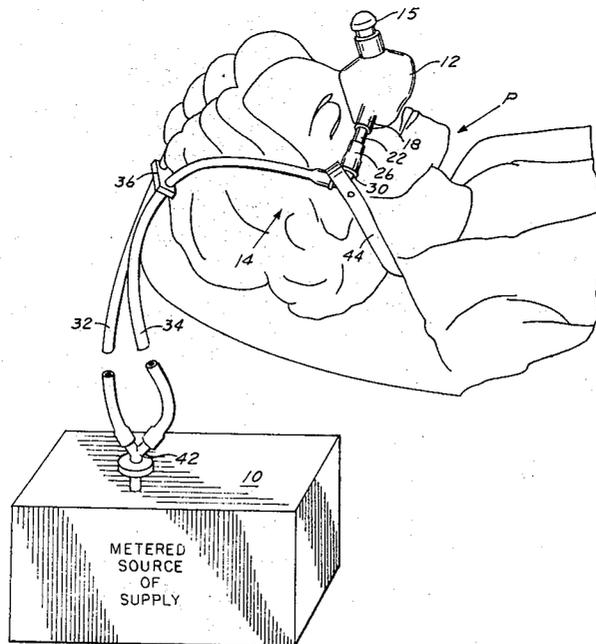


FIG. 1

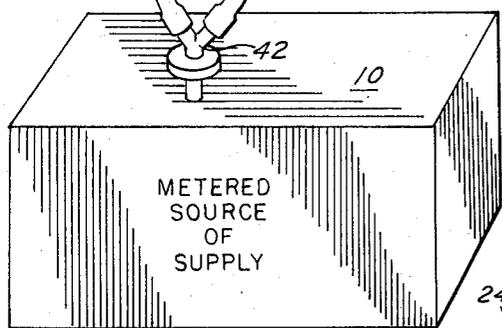
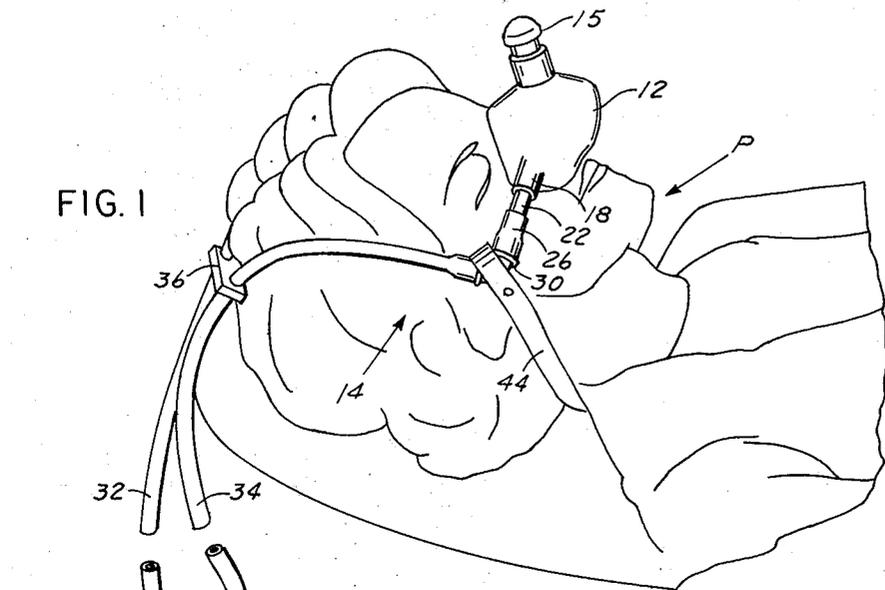


FIG. 2

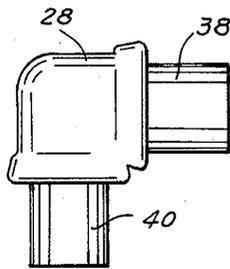
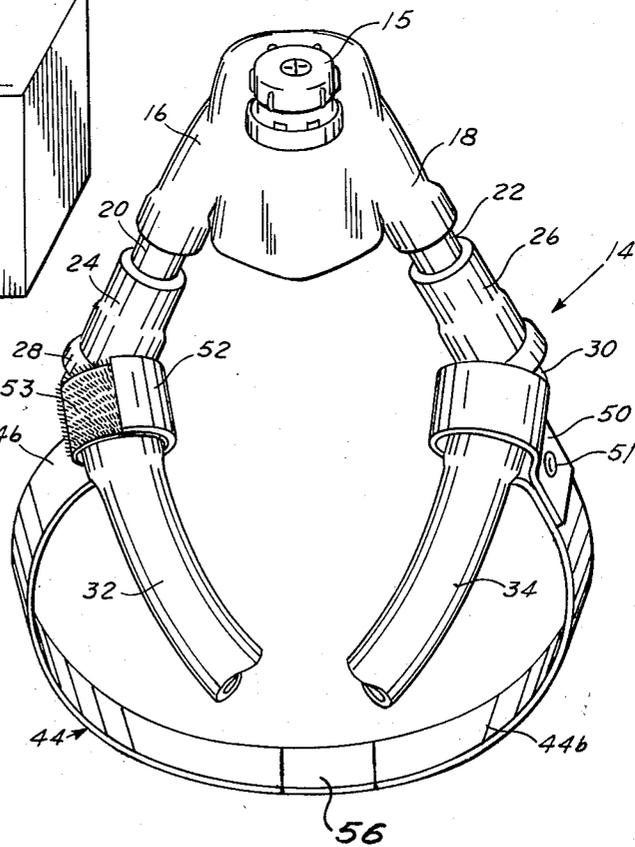


FIG. 3

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ANALGESIC APPARATUS

This invention generally relates to medical apparatus intended for use in administering analgesic or other medical vapors to a patient, and more particularly relates to a hose-linkage device for delivering gas from a suitable source of gas supply into a face mask or nasal inhalator and includes means for properly stabilizing the inhalator or mask on the patient's face.

It is customary in dental and surgical work to administer analgesic gases, such as, nitrous oxide to a patient through a nasal inhalator in order to reduce the patient's sensibility to pain without making him unconscious and while leaving the mouth free and unobstructed for dental or surgical work. Conventionally, the nasal inhalator is cupped over the patient's nose and can be firmly seated on the patient's face in the region surrounding the nose. Typically when the patient is in a prone position, gas is supplied to the inhalator through hoses which lead directly over the chair and face of the patient into the inhalator or may hang downwardly along the sides of the patient and chair then lead into the gas supply source. As a result, the gas supply hoses tend to interfere with the dentist in his work, making it difficult to keep the inhalator properly positioned and stabilized over the nose and also limit movement of the patient's head.

Accordingly, it is an object of the present invention to provide for a novel and improved gas delivery device for use in supplying analgesic gases or anesthetic to a nasal inhalator or face mask in dental or surgical operations.

It is another object of the present invention to provide for a novel and improved gas delivery device for use in supplying analgesic gases or anesthetic to a nasal inhalator or face mask in dental or surgical operations.

It is another object of the present invention to provide for novel and improved gas delivery apparatus for use in analgesic systems wherein the gases are supplied through lines passing over the top and along the sides of the patient's head so as not to limit head movement and not to present an obstruction to the dentist or surgeon in his work.

It is another object of the present invention to provide for gas delivery apparatus for use in an analgesic system in which triangulated gas supply hoses extend between a metered gas supply and the sides of an inhalator in such a way that the gas supply lines are directed downwardly along the sides of the face and rearwardly over the top or crown of the patient's head when the patient is in a prone position.

It is a further object of the present invention to provide for a novel and improved hose-linkage device specifically adapted for use in administering gas from a gas supply source to a nasal inhalator which includes a triangulated gas supply hose assembly between a metered gas supply and the inhalator, the hose assembly being adjustably and releasably secured to the patient's head without discomfort and permitting greater freedom of movement of the head without obstructing or interfering with the dental or surgical procedures.

The present invention is best exemplified by describing its use in connection with dental work wherein it is becoming more customary to administer analgesic gas through a nasal inhalator. It is standard practice to place the patient in a prone position in the dental chair

and with the end of the chair supporting the patient's head in proximity to a metered source of gas supply. In accordance with the present invention, a pair of gas delivery lines extend between the metered source of gas supply and the nasal inhalator and include lateral extensions which extend for relatively short distances in opposite directions away from opposite sides of the nasal inhalator to terminate at a point on opposite sides of the patient's head near the ears where they are joined by elbow-shaped fittings to rearwardly directed extension hoses leading rearwardly from the sides over the top or crown of the patient's head into the metered gas supply source. A hose clip is movable along the length of the rearward extension hoses to secure the hoses together at a location near the crown of the patient's head and, together with a connecting strap which is passed from the elbow portion of the hoses behind the neck, defines a fixed triangulation arrangement between the hose sections so as to firmly stabilize the inhalator over the nose and permit greater freedom of movement of the patient's head. In addition, since the extension hoses lead away from the lower ends of the extension hoses directly over the end of the chair to the metered gas supply source they do not present an obstruction or interfere with the dentist in his work. Moreover, in a manner to be hereinafter appreciated in more detail the assembly is readily conformable for use in different applications, and further can be readily adjusted and securely attached to the patient's head.

The foregoing and other objects, advantages and features of the present invention will become more readily appreciated and understood from the following more particular description of the invention when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an isometric view of the hose-linkage device of the present invention in operable use on a patient in an analgesic system.

FIG. 2 is an enlarged isometric view of the hose-linkage device of FIG. 1 attached to a conventional nose piece and also showing an anchoring strap for holding the nose piece against a patient's face.

FIG. 3 is an enlarged plan view of the elbow joint used in the hose-linkage device of FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring first to FIG. 1, an analgesic system is shown having a metered source 10 of analgesic gas, such as nitrous oxide, connected to a conventional inhalator or nose piece 12 by a preferred form of gas delivery apparatus 14 of the present invention.

The inhalator 12, best seen in FIG. 2, is a flexible rubber cup adapted to fit down over the nose of a patient P and seat on the patient's face, as shown in FIG. 1. The nose piece has an adjustable valve 15 to regulate the amount of air mixed with the analgesic gas administered to the patient, and suitable gas inlet means including two protruding hollow arms 16 and 18 extending from opposite sides of the inhalator which have rigid tubular hose connectors 20 and 22, respectively, hermetically sealed in their ends.

The gas delivery apparatus 14 takes the form of a hose-linkage device which includes a pair of gas supply conduits leading into opposite sides of the inhalator and consist of identical flexible rubber lateral extension hoses 24 and 26, a pair of identical hollow elbow joints

or fittings 28 and 30, a pair of identical rearward extension gas supply hoses 32 and 34, and a hose clip 36 for holding the gas supply hoses together at a location adjacent the top of a patient's head.

The lateral extension hoses 24 and 26 of the hose-linkage device comprise short pieces of flexible rubber hose (approximately two inches in length) which fit tightly at one end in an hermetic seal on the protruding ends of the hose connectors 20 and 22 respectively.

Elbow joint 28, which as stated before is identical to elbow joint 30, can be seen in FIG. 3 to have identical annular recessed ends 38 and 40. The recessed end 38 of each of the elbow joints 28 and 30 is adapted to be inserted into the free end of the extension hoses 24 and 26 respectively to provide hermetically sealed connections therewith. In practice the end 38 of each of the elbow joints would be inserted into the respective extension hoses so that the recessed end 40 of each of the elbow joints would be pointed toward the top of the patient's head.

The recessed end 40 of each of the elbow joints 28 and 30 is adapted to be inserted into one end of the gas supply hoses 32 and 34 respectively to provide hermetically sealed connections therewith. The other end of each of the gas supply hoses 32 and 34 is attached to a Y-fitting 42 which is connected in fluid communication to the metered gas source 10. Accordingly, two hermetically sealed fluid passages are provided through the hose-linkage device 14, whereby analgesic gas can be passed from the metered gas source 10 to the inhalator 12.

The hose clip 36 of the hose-linkage device is comprised of a flat bar having two adjacent apertures there-through and, as stated before, serves to hold the two gas supply hoses 32 and 34 together at a location adjacent the patient's head. The diameter of each of the apertures in the flat bar is substantially equivalent to the outside diameter of each of the gas supply hoses so that the clip 36 can be manually slid along the length of the hoses and will retain its longitudinal position on the hoses when released.

It will be apparent that the clip 36 when positioned adjacent the top of a patient's head and the elbow joints 28 and 30 define corners of a triangle whose respective sides are comprised of a portion of the supply hose 32, a portion of the supply hose 34, and the inhalator 12 along with the tubular connectors 20 and 22 and the extension hoses 24 and 26. This triangular arrangement provides a three-point stabilizing system for the inhalator 12 to prevent it from being easily dislocated since the elbow joints 28 and 30 rest on the cheeks of the patient on either side of the nose, and the hose clip 36 rests near the top of the patient's head at a location approximately equispaced from the two elbow joints.

To further stabilize the nose piece 12 on the patient's head and also to help provide an effective seal between the nose piece and the face of the patient to prevent peripheral leakage of the analgesic gas, connecting strap means 44, which can be passed behind the patient's head, are attached to the hose-linkage device 14. The anchoring strap means consists of a flat band having one end 50 looped over and attached to elbow joint 28, for example, by a rivet 51 attaching the free end to the band as shown. The opposite end 52 is adjustably attached to a connecting ring 53 surrounding a portion of the elbow 28. In order to effect an adjustable but secure, releasable attachment of the end 52 to the ring

53, both are surfaced with velcro tape fastening means 46 so that they can be quickly and easily secured together with the free end passing around the inside of the ring between the hose assembly and the side of the patient's head. Also, an elastic section 56 is provided in an intermediate portion of the band to assure a firm but yieldable attachment of the strap behind the patient's neck. Alternately, instead of attaching the free end 52 to the inside of the ring 53 as shown, it may be secured to the outside of the ring and a separate tape fastening strip attached to the inside in order to cover that portion of the ring 53 not secured to the free end 52 and prevent the ring from rubbing directly against the side of the patient's face.

It can thus be appreciated that a device for stabilizing an inhalator on a patient has been provided which includes means for fluidically connecting the inhalator to a gas supply and means for positioning the inhalator against the patient's face to alleviate peripheral leakage around the inhalator. The device is also effective in directing the gas supply hoses over the top of the patient's head where they will not interfere with a dentist's legs when he is working on the patient and will not inhibit head movement of the patient.

Although the best mode contemplated for carrying out the present invention has been herein shown and described, it will be apparent that modification and variation may be made without departing from what is regarded to be the subject matter of the invention.

What is claimed is:

1. Gas delivery apparatus for an analgesic system and the like having a gas supply source and a nasal inhalator adapted to fit over the nose and be confined to a limited area of a patient's face in closely surrounding relationship with the nose of the patient leaving the patient's mouth uncovered and provided with gas inlet means thereon on opposite sides of said inhalator, said apparatus comprising in combination, a pair of gas supply conduits on opposite sides of said inhalator and each gas supply conduit having a lateral extension, each said lateral extension extending in opposite directions to one another laterally away from connection to said gas inlet means and adapted to extend across each cheek of the patient and downwardly toward each ear of the patient when the patient is in a prone position and each lateral extension terminating in a lower end adapted to rest adjacent to each ear of the patient, and an elongated flexible extension in each gas supply conduit extending normal to and in the same direction away from connection with the lower end of each of said respective lateral extensions and adapted to be directed in a substantially horizontal direction away from the lower end of each lateral extension along the side of the patient's head when the patient is in a prone position for connection into said gas supply source, and connecting strap means connected to said gas supply conduits adjacent to the lower ends of said lateral extensions on opposite sides of the patient's head and adapted to pass behind the patient's neck.

2. Gas delivery apparatus according to claim 1, further including securing means for securing said elongated flexible extensions together ahead of their connection into said gas supply source.

3. Gas delivery apparatus according to claim 1, further including elbow-shaped fittings interconnecting the lower end of each lateral extension with a respective elongated flexible extension in each gas conduit

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member for extension of said elongated flexible extensions perpendicular to the lateral extensions.

4. Gas delivery apparatus according to claim 3, said connecting strap connected at opposite ends to said elbow-shaped fittings in each of said gas supply conduits.

5. In an analgesia system, gas delivery means for supplying gaseous fluids from a gas supply source to a nasal inhalator adapted to fit over the nose and be confined to a limited area of a patient's face in closely surrounding relationship with the nose of the patient leaving the patient's mouth uncovered wherein said inhalator is provided with oppositely directed, open tubular connecting means thereon, said apparatus comprising in combination:

first and second gas supply hoses each connected at one end to one of said open tubular connecting means and each adapted to extend laterally away from said inhalator and downwardly for termination at a point along the side of the patient's head when the patient is in a prone position,

first and second extension hoses extending from the terminal ends of said lateral extension hoses for connection to the gas supply source,

first and second elbow joints interconnecting the terminal ends of said first and second lateral extension hoses, respectively, with each of said respective first and second extension hoses so that the rearward extension hoses extend in a common direction substantially normal to the lateral extension of said lateral extension hoses,

a hose clip adapted to releasably and adjustably hold together the first and second rearward extension hoses at a point over the patient's head, and

a connecting strap connected at opposite ends to said elbow-shaped joints and adapted to pass behind the patient's neck.

6. In an analgesia system according to claim 5, said connecting strap having one end looped over and permanently attached to one of said elbow-shaped connections and the opposite end being looped over the other elbow-shaped connection and adjustably attached to regulate the tautness of the strap behind the patient's neck.

7. In an analgesia system according to claim 6, said adjustable connecting end including a circular band on said elbow-shaped connection provided with an outer

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fibrous adhesive surface, and the looped end of said strap at the adjustable connecting end provided with a mating fibrous material for adjustable connection to said circular band.

8. In an analgesia system according to claim 7, said strap including an elastic portion to permit limited stretching of said strap.

9. In an analgesia system, gas delivery means for supplying gaseous fluids from a gas supply source to a cupped nasal inhalator adapted to fit over the nose and be confined to a limited area of a patient's face in closely surrounding relationship with the nose of the patient leaving the patient's mouth uncovered wherein said inhalator is provided with open tubular connecting means on opposite sides thereof, said apparatus comprising in combination:

first and second extension hoses each hermetically connected at a first end to one of said open tubular connecting means and each extension hose providing an extension of said open tubular connecting means away from said inhalator,

first and second hollow elbow joints each having first and second open ends directed in substantially normal directions, said first end of each elbow joint being hermetically connected to a second end of an associated extension hose,

first and second elongated gas supply hoses having first and second open ends, the first open end of said gas supply hoses being hermetically connected to the second open end of an associated elbow joint so as to extend normally away from the associated extension hose, and the second open end of said gas supply hoses being hermetically connected to said gas supply source,

a hose clip movably connected to both gas supply hoses and adapted to adjustably hold together the gas supply hoses at selected locations along their length, and

an adjustable connecting strap connected to each of said elbow joints whereby when the inhalator is disposed over a patient's nose, the elbow joints are adapted to rest on the patient's cheeks and the adjustable strap is adapted to be passed beneath the patient's ears and around the patient's neck to anchor the inhalator on the patient's face.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,799,164 Dated March 26, 1974

Inventor(s) Richard R. Rollins

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the Title Page:

Cancel "Assignee: E.I. du Pont de Nemours and Company, Wilmington, Del." since invention was never assigned by Richard R. Rollins

Signed and Sealed this

Twenty-fourth **Day of** August 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

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