United States Patent [19]

St. Clair

[11] **3,848,607**

[45] **Nov. 19, 1974**

[54] **THERAPEUTIC APPARATUS**

[76] Inventor: **Mel St. Clair,** 31 Byram Shore Rd., Greenwich, Conn. 06830

[22] Filed: **June 8, 1973**

[21] Appl. No.: **368,073**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 193,679, Oct. 29, 1971, abandoned.

[52] **U.S. Cl.** **128/400,** 128/64, 128/401
[51] **Int. Cl.** **A61f 7/00**
[58] **Field of Search** ..... 128/400, 401, 24.1, 24.2, 128/64, 344, 342, 62 A

[56] **References Cited**

UNITED STATES PATENTS

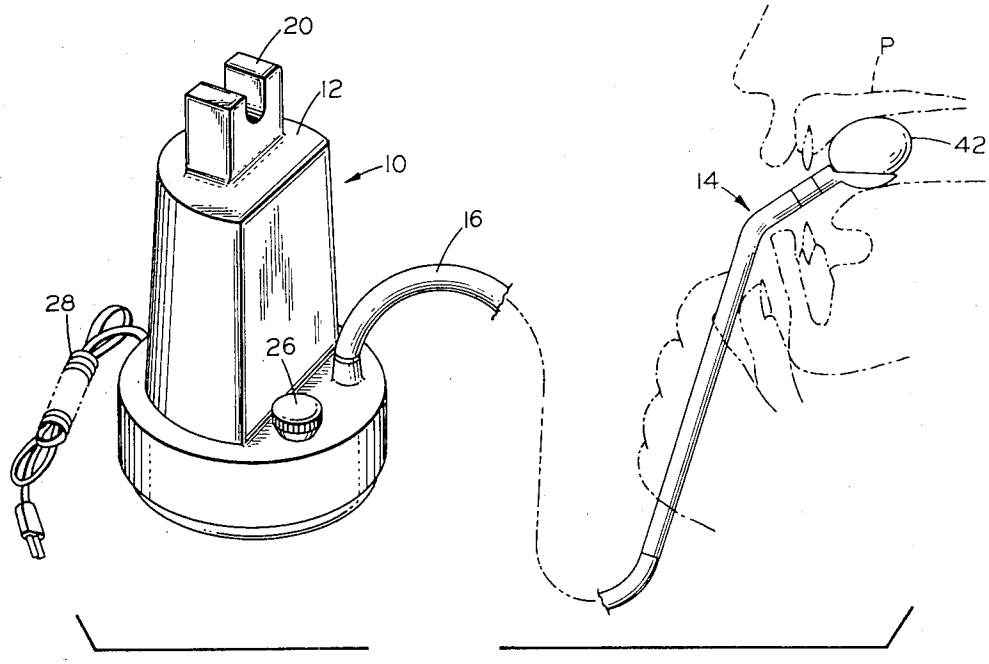
1,764,838	6/1930	Horne	128/64
2,052,321	8/1936	Smart	128/64 UX
2,101,273	12/1937	Smith	128/64 X
2,466,042	4/1949	Reich et al	128/401

Primary Examiner—Lawrence W. Trapp
Attorney, Agent, or Firm—McCormick, Paulding & Huber

[57] **ABSTRACT**

A therapeutic apparatus for the treatment of congestion and infection in the sinuses and surrounding areas of the nose, mouth and eyes is formed from a heat applicator that can be held against the hard palate of the mouth to transfer dry heat through the palate and into the affected area of the head. The apparatus is provided with a heater which heats a fluid within a housing and a pump which circulates the heated fluid through the applicator held manually in the mouth. The applicator includes a ducted handle which is connected by a flexible tubing to the pump in the housing to receive heated fluid and a hollow, pliable pillow through which the heated fluid is circulated. The pliable pillow held in the mouth conforms to the interior shape of the mouth, especially the hard palate, and allows the heat from the circulating fluid to be transferred into the head to bring relief from the congestion and infection in the affected area.

11 Claims, 6 Drawing Figures



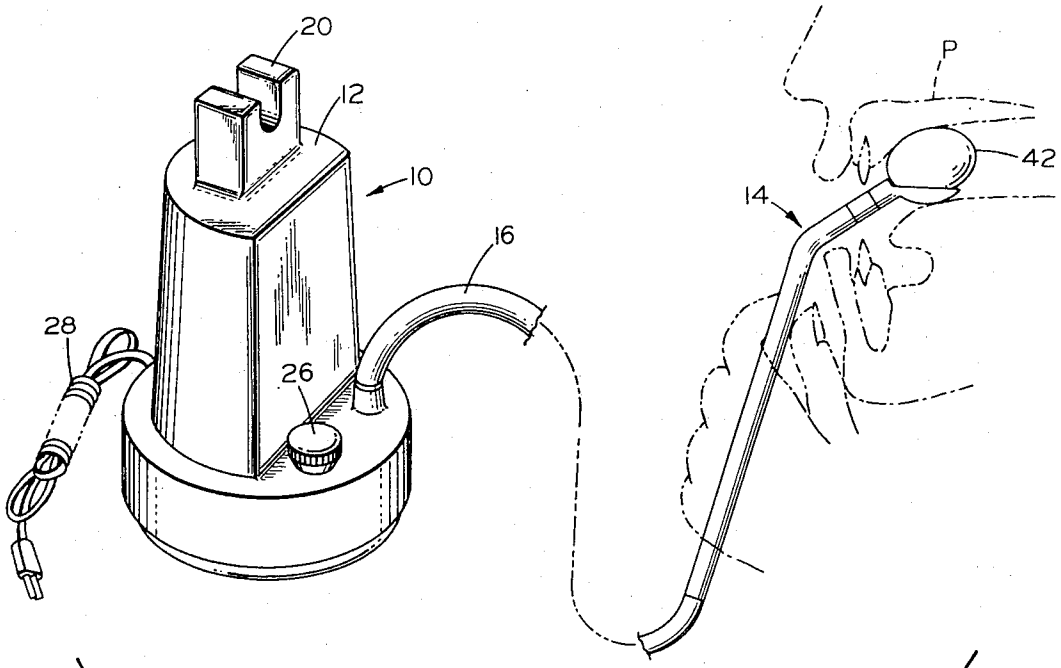


FIG. 1

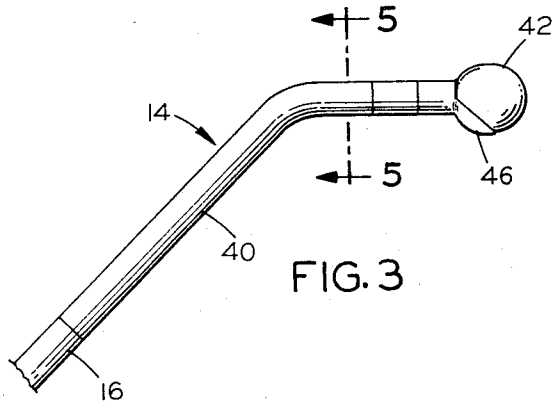


FIG. 3

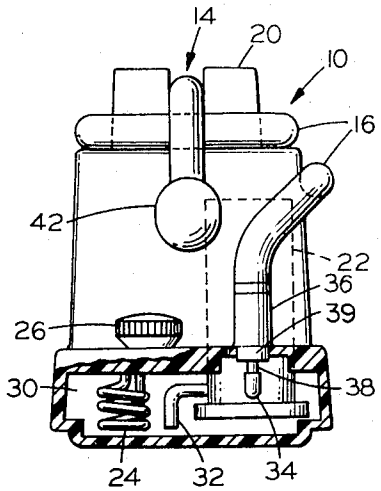


FIG. 2

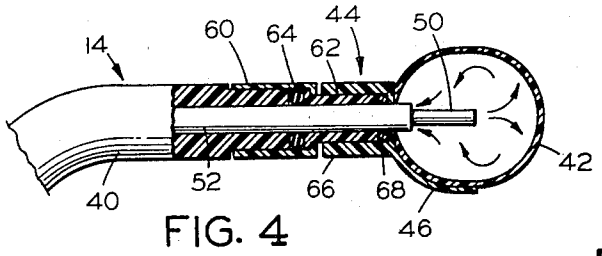


FIG. 4

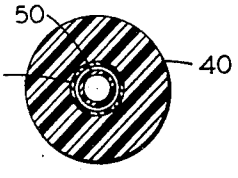


FIG. 5

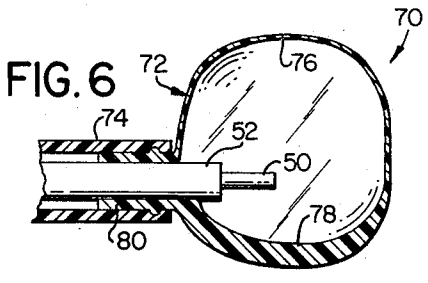


FIG. 6

THERAPEUTIC APPARATUS

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation-in-part of copending abandoned application Ser. No. 193,679 filed Oct. 29, 1971 by the same inventor.

BACKGROUND OF THE INVENTION

This invention relates to a therapeutic device for the treatment of congestion and infection and similar chronic conditions which cause patients to persistently suffer from the discomforts and pain accompanying such conditions.

The discomforts and pain associated with sinus congestion and similar ailments are known to effect significant portions of the population. In many instances, the pain associated with such ailments requires medical treatment to obtain relief. The treatment of such ailments is particularly desirable from the patient's standpoint because discomfort in the region of the nasal cavity also effects breathing and the sense organs in the immediately surrounding area of the head.

As indicated by U.S. Pat. No. 2,257,329, it has been known for some time that the application of heat to the hard palate and surrounding region can have significant, beneficial affects in relieving congested conditions and the associated pain and discomfort. While the apparatus disclosed in the referenced patent is intended for the same type of treatment as the apparatus of the present invention, there is still a need for a simple, self-contained inexpensive apparatus of this type and it is believed that the apparatus of the present invention can fulfill this need due to the differences in construction and the ease and convenience with which the apparatus may be employed.

It is accordingly an object of the present invention to disclose an improved therapeutic apparatus for the treatment of congestion and infection in the nasal cavity and the regions surrounding the hard palate of the mouth.

SUMMARY OF THE INVENTION

The present invention resides in a therapeutic apparatus for the treatment of congestion and infection in the mouth, nasal cavity, sinuses and surrounding areas of the head. The apparatus comprises a fluid chamber which can be enclosed within a housing and in which a fluid may be admitted and discharged. Heating means is connected with the chamber for heating the fluid admitted to the chamber and pumping means in fluid communication with the chamber is utilized to pump the fluid from the chamber and to circulate the fluid through the applicator. The applicator includes a handle and a hollow, pliable pillow formed from a fluid impervious material and connected to the handle so that a patient can hold the pillow gently and compressively against the hard palate of the mouth. The pillow is connected in fluid communication with the pumping means and receives the heated fluid from the chamber. When the pliable pillow is gently supported against the roof of the mouth, it conforms easily to the interior shape of the mouth, especially the hard palate, and provides good surface contact so that the dry heat can be transferred from the heated fluid through the pillow and the palate into the affected area of the head. The apparatus may be manufactured economically for purchase by the general public so that afflicated patients can provide their own self-treatment whenever relief from the chronic condition is desired.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a therapeutic apparatus embodying the present invention and indicates the method by which the apparatus is used to treat congestion and infection in the nasal cavity.

FIG. **2** is a side view partially in section showing the components of the apparatus within the housing and the applicator in its storage position on the housing.

FIG. **3** is a side view of the applicator shown in FIGS. **1** and **2.**

FIG. **4** is an enlarged sectional view of the distal end of the applicator.

FIG. **5** is an enlarged sectional view of the applicator as seen along the sectioning line **5—5** of FIG. **3.**

FIG. **6** is an enlarged sectional view of the distal end of an applicator having an integral reinforcing portion of the hollow pillow.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. **1** and **2** show a therapeutic apparatus for the treatment of congestion and infection in the mouth, nasal passages, sinuses and the surrounding areas of the head. The apparatus is comprised principally of a pedestal or base **12** and a hand-held heat applicator **14** which is connected to the pedestal **12** by a flexible tubing **16.** The pedestal **12** forms a housing in which the heavier components of the apparatus are enclosed so that the applicator **14** remains relatively light and easy to hold manually within the patient's mouth against the hard palate P as shown in FIG. **1.** The upper portion of the pedestal **12** includes a saddle **20** about which the tubing **16** may be wrapped and in which the applicator **14** can be stored when not in use as shown in FIG. **2.**

Within the housing of the pedestal **12** are a fluid pump **22** and an adjustable electrical heater **24.** Both the pump **22** and the heater **24** are turned on and off from a control knob **26** located in the lower portion of the pedestal **12** and operate on standard electrical power supplied through the power cord **28.** The therapeutic apparatus **10,** therefore, can be operated by a patient in his own home or office without specialized medical equipment or supplies.

As shown in FIG. **2,** the lower portion of the pedestal **12** includes a fluid chamber **30** which is used to receive, store and discharge a fluid, such as water, or ethylene glycol, that carries, heat to the hand-held applicator **14.** The pedestal **12** may also be provided with a cap or plug (not shown) so that the chamber **30** can be filled with fluid prior to initial use or emptied of fluid as needed. It is possible in an alternate embodiment of the invention to eliminate the fill plug and employ a closed system in which the fluid is retained within the apparatus **10** at all times.

The heater **24** shown in FIG. **2** is a conventional electrical coil which is immersed in the fluid chamber **30.** In addition to turning the apparatus on and off, the control knob **26** also operates a thermostatic control device, such as bimetallic switch, connected with the heater **24** to regulate the amount of heat delivered from the heater **24** to the fluid. In this manner, a patient can

control the amount of heat which is transferred from the applicator **14** into the nasal cavity and can prevent the temperature of the heated fluid from becoming elevated to a point that would cause the roof of the mouth to be irritated or otherwise injured from too much heat. A heat sensing cutout is used to prevent excessive heating.

The temperature range for the fluid circulated through the applicator **14** is limited if the most beneficial therapeutic effects are to be obtained from the apparatus. A fluid temperature suitable for most patients lies in the range of 110°F to 170°F. The temperature settings of control knob **26** may be indicated by graduations about the knob so that the heater **24** cycles on and off at temperatures within this range. Below this range the amount of heat delivered to the afflicted area is minimal and temperatures above this range cannot generally be tolerated by a patient. A more limited temperature range is 145°F to 160°F. The more limited temperature range provides an adequate temperature differential between the circulating fluid and the body so that a reasonable quantity of heat will be delivered to the afflicted area. At the same time, however, elevated temperatures which cannot be tolerated by patients having sensitive tissue are avoided.

The pump **22** has an inlet tube **32** which projects downwardly from the pump and forms an inlet port adjacent to the bottom of the fluid chamber **30.** The pump **22** also includes a discharge tube **34** forming a discharge port which is connected through a coaxial passageway fitting **36** to the flexible tubing **16.** Both the flexible tubing **16** and the fitting **36** have coaxial passageways forming supply and return ducts so that the heated fluid can be pumped from the chamber **30** to the applicator **14** and back to the chamber **30.** In the fitting **36,** the passageways are formed by coaxial conduits **38** and **39.** The discharge tube **34** of the pump **22** is connected to the inner conduit **38** so that heated fluid is supplied to the applicator **14** through the conduit **38** and returns through the conduit **39.** The conduit **39** terminates above the conduit **38** so that fluid returning from applicator **14** spills into the chamber **30.** The inlet tube **32** is spaced from the return conduit **39** and is located adjacent the heater **24** so that heated fluid is ingested by the pump.

FIGS. **3, 4** and **5** show the detailed construction of the hand-held applicator **14.** The applicator **14** comprises principally a handle **40** connected at its proximal end with the flexible tubing **16** and a hollow, pliable pillow **42** which projects from and is connected to the distal end of the handle **40** by means of a releasable coupling **44.** The handle **40** is molded from a relatively rigid material such as acrylanitrelbutadyrenestyrene (ABS) which is a hard plastic that can provide support for the pliable pillow **42** and permit the pillow to be gently compressed against the hard palate in the mouth. The pillow is formed from a fluid impervious and pliable material, such as a vinyl, so that it can be deformed when pressed against the palate and present a large surface area in contact with the roof of the mouth for good heat transfer characteristics. To support the pillow **42** in a slightly compressed condition, the distal end of the handle includes a rigid backing element **46** which extends at an angle to the handle at the distal end adjacent a limited surface area on the lower side of the pillow. The pillow as indicated has a bulbous configuration and the backing element **46** has a corresponding concave configuration so that it does not destroy the shape of the pillow and thereby interfere with the circulation of fluid into and out of the pillow when the pillow is pressed upwardly against the palate.

As seen most clearly in the enlarged sectional views of the applicator **14** in FIGS. **4** and **5,** the handle **40** has two coaxial conduits **50** and **52** which form the coaxial fluid passageways connected respectively through the flexible tubing **16** to the coaxial conduits **38** and **39** in the fitting **36** on the pedestal **12.** Consequently, the heated fluid is delivered through the inner conduit **50** to the pliable pillow **42** and transfers heat into the hard palate and surrounding areas of the head while the fluid circulates through the pillow. The fluid then returns through the conduit **52** to the pedestal where it is again heated and delivered back to the pillow.

It is preferable that the cross-sectional area of the conduit **50** be slightly larger than the effective cross-sectional area through which fluid is returned in the conduit **52.** The differential in the cross-sectional area produces a slightly greater restriction in the flow of fluid returning to the chamber **30** and thereby insures that a slightly increased pressure level will persist in the pillow **42** to hold the pillow inflated in its bulbous configuration while it is compressed against the palate as shown in FIG. **1.**

The fluid pump **22** can provide either a steady or a pulsating flow of fluid to the pliable pillow **42.** In specific embodiments of the apparatus having pumps providing a pulsating flow, the pulsation rate of the fluid delivered to the pillow **42** should lie in a range of 60 to 900 pulses per minute. One advantage offered by a pulsating fluid flow is that the pliable pillow **42** flexes slightly with each pulsation and provides a slight massaging effect on the body region being treated. Both the massage and heat are effective treatments for some patients suffering from sinus difficulties. In addition to the massage, however, the pulsating effect of the pillow is preferred by some patients who would otherwise experience a gagging sensation induced by the presence of the pillow at rest in the mouth.

The releasable coupling **44** at the distal end of the handle **40** permits the pliable pillow **42** to be removed and installed as needed. The coupling includes a ferrule **60** crimped on the handle **40** and a telescoped section **62** held in its extended position from the ferrule by a packing **64.** The section **62** is cylindrical and has threads on its outer cylindrical surface so that an internally threaded cap **66** attached to the pillow **42** and supporting the backing element **46** can be threaded onto the section **62.** An O-ring **68** sandwiched between the end of the section **62** and the cap **66** insures a fluid-tight joint. If the pillow **42** becomes damaged or leaks, the replacement is greatly simplified by the coupling **44.**

FIG. **6** illustrates a modified form of an applicator, generally designated **70.** The applicator **70** is connected to the pedestal **12** by flexible tubing **16** in the same manner as the applicator **14** in FIG. **1.** The applicator **70** is comprised of a hollow, pliable pillow **72** and a handle **74** connected at the distal end to the pillow **72.** The pillow **72** is formed from a fluid impervious material and has a thin, smooth, pliable upper surface portion **76** and a thick, rigid lower surface portion **78.** At one side of the pillow, a connecting sleeve **80** is provided to attach the pillow to the distal end of the handle **74.** A rib on the sleeve and corresponding groove in the

handle form a releasable coupling permitting the pillow and handle to be readily connected and disconnected.

The sleeve **80**, the rigid lower portion **78** of the pillow and the upper portion **76** are all interconnected and can be formed in an integral unit by, for example, a simple blow-molding process. It will be readily apparent that the rigid portion **78** projecting slightly down and then spreading outwardly away from the sleeve **80** with a rigid interconnection to the sleeve serves the basic supporting function for the rest of the pillow in a manner similar to the separate rigid backing member **46** in the embodiment of the applicator shown in FIG. **4.** The sleeve **80** is hollow and receives the inlet and discharge tubes **50** and **52** respectively in sealing relationship so that the circulation of heated fluid through the pliable pillow can be carried out in the same manner as described above. The pliable upper portion **76** of the pillow, of course, is braced by the lower portion **78** and will readily conform to the hard palate of the mouth or other region being treated under the slight pressure applied to the pillow through the handle.

It will thus be seen that the therapeutic apparatus **10** can be utilized to apply a dry heat to the hard palate of the mouth in order to provide relief from the pain and discomfort of congestion and infection in the nasal cavity. The apparatus is assembled in an inexpensive self-contained unit that requires only a power source and a fluid, such as water or similar fluid, for operation. Therefore, the patient can treat his condition at his own convenience. The apparatus is designed with the heat applicator **14** or **70** on a flexible tube separate from the pumping and heating components which greatly facilitates the use of the apparatus. The patient simply holds the applicator by the handle with the pliable pillow pressed gently against the hard palate region of his mouth in order to derive the benefits of the dry heat produced by the circulation of heated fluid from the pedestal **12** through the applicator.

While the present invention has been described in a preferred embodiment, it will be understood that numerous modifications and substitutions can be had without departing from the spirit of the invention. For example, although the handle of the applicator **14** or **70** is provided with fluid passageways through which the heated fluid is delivered to and returned from the pillow, separate conduits leading directly from the pump to the pillow could be provided. Specific hard plastic materials have been mentioned as desirable for constructing the handle and the same materials may be used for the pedestal **12**; however, such materials are not necessarily the only suitable materials and others may be substituted if desired. The pump **22** and the heater **24** may also be designed to operate from a battery or other power source so that the apparatus can be made portable for operation in a vehicle or other locations where standard electrical power is not available. Other types of heaters such as chemical, solar or nuclear heat generators may be used in place of the electrical heater **24.** Of course, it is not essential that the fluid be circulated through the fluid chamber **30** for reheating. The chamber **30** may simply be a reservoir in which the fluid is heated prior to being circulated through the pillow and disposed of. However, the closed fluid circuit system described is more economical and convenient since it does not require the heating and disposal of large quantities of fluid. Accordingly, the present invention has been disclosed in a preferred embodiment by way of illustration rather than limitation.

I claim:

1. Therapeutic apparatus for the treatment of congestion, infection and similar conditions in the mouth, nasal passages, sinuses and regions of the head surrounding the mouth comprising: a base having a fluid chamber for receiving and storing a fluid; pumping means connected with the base and communicating with the fluid chamber for pumping the fluid received by the chamber; heating means to heat the fluid pumped from the chamber in the base by the pumping means; flexible fluid conduit means connected at one end with the base to receive the fluid pumped from the chamber and having another end provided with two fluid passageways; and a hand-held applicator connected to the other end of the flexible fluid conduit means to permit the applicator to be manually manipulated remotely of the base, the applicator including a relatively rigid, elongated handle, a hollow pillow formed from a fluid impervious material and coupled directly to one end of the elongated handle for support within the mouth compressed against and conformed to the hard palate and rigid backing means extending between the one end of the handle and the hollow pillow, the hollow pillow also being connected to the other end of the flexible fluid conduit means with the two fluid passageways communicating with the interior of the pillow to permit the pumped and heated fluid to be circulated in and out of the pillow, the pillow being of a bulbous configuration suitable for insertion in the mouth and having a pliable surface portion extending at least from one lateral side of the pillow over the upper part of the pillow pressed against the palate to the other lateral side, the pliable surface portion being smooth to permit efficient transfer of dry heat through the pillow material into the hard palate from the fluid circulated through the interior of the pillow, the rigid backing means having a concave contour, diverging from the axis of the handle at the one end and extending under the pillow to provide support for the pillow along the full periphery of the area of contact between the pliable surface and the palate.

2. A therapeutic apparatus as defined in claim **1** wherein the fluid chamber in the base, the pumping means and the hollow pillow are interconnected in a closed fluid circuit by the flexible fluid conduit means whereby the heated fluid may be circulated between the pillow and the base.

3. A therapeutic apparatus as defined in claim **2** wherein the pumping means comprises a pump having an inlet port through which the fluid in the chamber is ingested and a discharge port through which the fluid is expelled; and the flexible fluid conduit means includes two fluid passageways, one passageway extending from the discharge port Of the pumping means to the interior of the hollow pillow and the other passageway extending from the hollow pillow to the fluid chamber in the base.

4. A therapeutic apparatus as defined in claim **3** wherein the two fluid passageways of the flexible fluid conduit means are coaxial between the base and the pillow.

5. A therapeutic apparatus for the treatment of congestion and infection as defined in claim **1** wherein the

heating means comprises a manually adjustable heater.

6. A therapeutic apparatus as defined in claim 1 wherein the one end of the handle of the applicator includes a releasable coupling connecting the pillow directly to the handle for removal and installation of the pillow.

7. A therapeutic apparatus as defined in claim 1 wherein the fluid conduit means extends from the base through the elongated handle to the hollow pillow.

8. A therapeutic apparatus as defined in claim 1 wherein the pumping means includes a fluid pump providing a pulsating flow of fluid for the hollow pillow.

9. A therapeutic apparatus for the treatment of afflicted regions of the body surrounding a natural body opening comprised of: an elongated and rigid positioning handle having a distal end and a proximal end and a passageway extending between the ends; a hollow, pliable pillow connected directly to the distal end of the handle for support in a position within the body opening in contact with the afflicted region, the pillow having a bulbous configuration and being formed from a fluid impervious material having a smooth, pliable, surface portion; rigid supporting means departing at an angle to the handle at the distal end and having a contoured configuration matching the bulbous configuration of the pillow to provide support for the pillow against the palate; and flexible fluid conduit means leading from the hollow, pliable pillow at the distal end of the handle through the passageway in the handle and the proximal end for circulating a treatment fluid through the pillow and adjacent the afflicated region without direct contact of the fluid and the body.

10. A therapeutic apparatus for the treatment of congestion, infection and similar conditions in afflicted regions of the body surrounding a natural body opening such as the nasal passages, sinuses and regions of head adjacent the mouth comprised of: an elongated and rigid positioning handle having a distal end and a proximal end; and a hollow bulbous pillow connected directly to the distal end of the handle for insertion through the natural opening and for positioning in the body adjacent the afflicted region and formed from a fluid impervious material, the pillow having a pliable, upper surface portion and a rigid lower surface portion integrally connected in a bulbous configuration; the pliable upper surface portion extending from one lateral side of the pillow over the upper part of the pillow to the opposite lateral side and being smooth and sufficiently pliable to conform to the body shape within the opening and to permit efficient transfer to heat through the pillow to the body; the rigid, lower portion extending under the lower part of the pillow and having a rigidity sufficient to hold the integrally connected pliable portion in a compressed condition against the afflicted body region to further insure the efficient transfer of heat.

11. A therapeutic apparatus as defined in claim 10 wherein: the elongated positioning handle has a passageway extending between the ends of the handle; and the hollow pillow further includes a sleeve integrally connected to the other portions of the pillow and connecting with the passageway at the distal end of the elongated handle, the sleeve being rigidly interconnected with the rigid portion of the pillow.

* * * * *